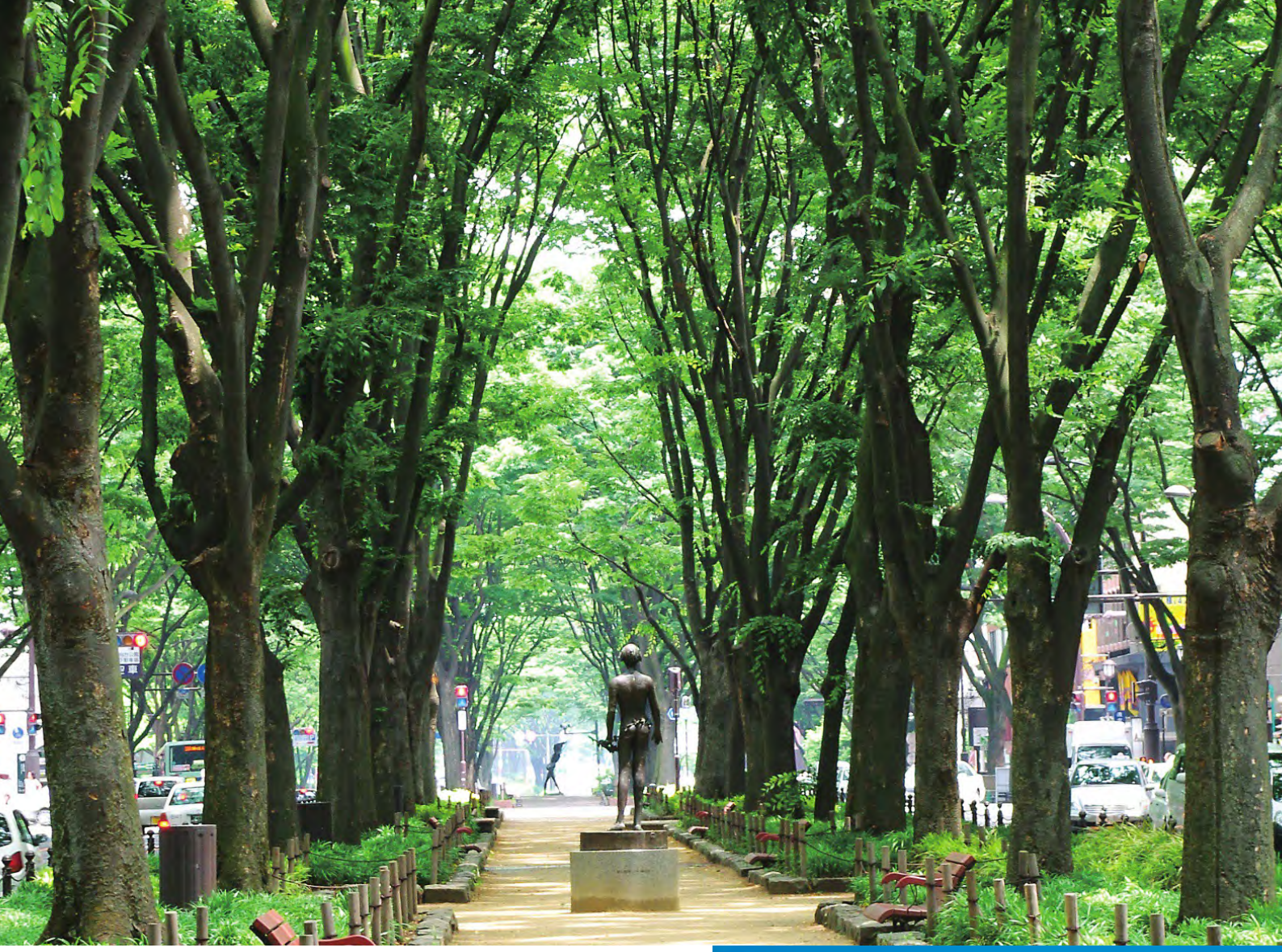

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Session TU
TUTORIAL: MAGNETIC SENSORS

Hyunsoo Yang, Chair
National University of Singapore, Singapore

TU-01. **Magnetic nanoparticles and sensors for rapid diagnostic testing in healthcare, food safety, and environmental control.** ***(Invited)*** *M. Rivas[1] 1. University of Oviedo, Oviedo, Spain*

TU-02. **Magnetoresistive and anomalous Hall sensors: from static to dynamic linearization and single device vector field sensing.** ***(Invited)*** *Y. Wu[1] 1. National University of Singapore, Singapore*

TU-03. **Magnetic sensors for industrial and automotive applications.** ***(Invited)*** *W. Lee[1] 1. Texas Instruments, Dallas, TX, United States*

Session PL
IEEE AWARD CEREMONY & PLENARY SESSION

Koki Takanashi, Co-Chair
Tohoku University, Sendai, Japan
Bethanie Stadler, Co-Chair
University of Minnesota, Minneapolis, MN, United States

PL-01. **NanoTerasu: Next Generation Synchrotron Light Source in Japan.** ***(Invited)*** *M. Takata[1] 1. International Center for Synchrotron Radiation Innovation Smart (SRIS), Tohoku University, Sendai, Japan*

Session SA
AI/ML APPROACHES FOR THE DEVELOPMENT AND DISCOVERY OF FUTURE MAGNETIC MATERIALS

Atsufumi Hirohata, Chair
University of York, York, United Kingdom

SA-01. **Machine learning collective excitations in quantum materials.** ***(Invited)*** *M. Li[1] 1. Department of Nuclear Science and Engineering, MIT, Cambridge, MA, United States*

SA-02. **Predicting topological properties in materials using machine learning.** ***(Invited)*** N. Claussen[1], N. Andrejevic[2,3], J. Andrejevic[4,5], B. Bernevig[6,7], *N. Regnault*[8], F. Han[3,9], G. Fabbris[10], T. Nguyen[3,9], N.C. Drucker[3,5], C.H. Rycroft[11,6] and M. Li[3,9] *1. Department of Physics, University of California at Santa Barbara, Santa Barbara, CA, United States; 2. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 3. Quantum Measurement Group, Massachusetts Institute of Technology, Cambridge, MA, United States; 4. Department of Physics, University of Pennsylvania, Philadelphia, PA, United States; 5. John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, United States; 6. Department of Physics, Princeton University, Princeton, NJ, United States; 7. Donostia International Physics Center, Donostia-San Sebastian, Spain; 8. Laboratoire de Physique de l'Ecole Normale Supérieure, ENS, Université PSL, CNRS, Sorbonne Université, Université Paris-Diderot, Paris, France; 9. Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 10. Advanced Photon Source, Argonne National Laboratory, Lemont, IL, United States; 11. Department of Mathematics, University of Wisconsin-Madison, Madison, WI, United States*

SA-03. **Magnetic materials prediction, high through put, artificial intelligence versus materials intuition.** ***(Invited)*** *C. Felser*[1], M. Vergniory[1,2], Y. Zhang[1,3], Y. Sun[1,4] and J. Noky[1] *1. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 2. Donostia International Physics Center, Donostia-San Sebastián, Spain; 3. Physics, Massachusetts Institute of Technology, Boston, MA, United States; 4. Shenyang National Laboratory for Materials Science, Shenyang, China*

SA-04. **Autonomous materials search for high-magnetization alloy.** ***(Invited)*** *Y. Iwasaki*[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

SA-05. **Robust Exchange Stiffness at Interface of Magnetic Tunnel Junctions.** ***(Invited)*** *M. Shirai*[1,2], T. Roy[2] and M. Tsujikawa[1] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

SA-06. **Physics Informed Machine Learning for Permanent Magnet Design.** ***(Invited)*** *A. Kovacs*[1,2], J. Fischbacher[1,2], H. Oezelt[1,2], A. Kornell[1,2], Q. Ali[1,2], M. Gusenbauer[1,2], M. Yano[3], N. Sakuma[3], A. Kinoshita[3], T. Shoji[3], A. Kato[3], T. Fukushima[4], H. Akai[4], N. Kawashima[4], T. Miyake[5] and T. Schrefl[1,2] *1. Christian Doppler Laboratory for Magnet Design through Physics Informed Machine Learning, University for Continuing Education Krems, Krems, Austria; 2. Department for Integrated Sensor Systems, University for Continuing Education Krems, Krems, Austria; 3. Advanced Materials Engineering Div., Toyota Motor Corporation, Mishuku Susono, Japan; 4. The Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 5. National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

Session SB
COHERENT MAGNON INTERACTIONS

Axel Hoffman, Chair
University of Illinois at Urbana-Champaign, Urbana, IL, United States

SB-01. **Many-body magnonic open quantum systems.** ***(Invited)***
M. Elyasi[1], T. Hioki[1,2], T. Makiuchi[2], S. Kanai[3,1], L. Sheng[4], K. Yamamoto[5], H. Kurebayashi[6], T. van der Sar[7], H. Yu[4], Y. Blanter[7], S. Fukami[3,1], E. Saitoh[2,1] and G. Bauer[1,8]
1. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 3. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 4. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China; 5. Japan Atomic Energy Agency, Tokai, Japan; 6. London Centre for Nanotechnology, University College London, London, United Kingdom; 7. Kavli Institute of Nanoscience, Delft University of Technology, Delft, Netherlands; 8. Kavli Institute for Theoretical Sciences, University of Chinese Academy of Sciences, Beijing, China

SB-02. **Withdrawn**

SB-03. **Coherent Coupling of Two Remote Magnonic Resonators Mediated by Superconducting Circuits.** ***(Invited)*** *Y. Li*[1], V.G. Yefremenko[2], M. Lisovenko[2], C. Trevillian[4], T. Polakovic[3], T.W. Cecil[2], P.S. Barry[2], J.E. Pearson[1], R. Divan[5], V. Tyberkevych[4], C.L. Chang[2], U. Welp[1], W. Kwok[1] and V. Novosad[1] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. High Energy Physics Division, Argonne National Laboratory, Lemont, IL, United States; 3. Physics Division, Argonne National Laboratory, Lemont, IL, United States; 4. Department of Physics, Oakland University, Rochester, MI, United States; 5. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States*

SB-04. **Magnon-phonon coupling in a layered antiferromagnet.** ***(Invited)*** *J. Puebla*[1], T. Lyons[1], K. Yamamoto[2], R. Deacon[1], Y. Hwang[1], S. Maekawa[1] and Y. Otani[1] *1. Center for Emergent Matter Science, RIKEN, Wako, Japan; 2. Japan Atomic Energy Agency, Tokai, Japan*

SB-05. **Design of k-space Magnon Dynamics by Machine Learning.** ***(Invited)*** *G. Csaba*[1], A. Papp[1], A. Horvath[1], J. Kim[3], M. Massouras[3], A. Anane[2], C. Serpico[4], S. Perna[4] and M. d'Aquino[4] *1. Pazmany University Budapest, Budapest, Hungary; 2. Unite Mixte de Physique, CNRS, Thales, Universite Paris-Saclay, Paris, France; 3. Centre for Nanoscience and Nanotechnology, CNRS, Universite Paris-Saclay, France, Paris, France; 4. University of Naples, Naples, Italy*

SB-06. **Pattern Recognition with Magnons.** ***(Invited)*** *K. Schultheiss*[1]
1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

Session SC
FUNDAMENTALS OF MAGNETIC NANOPARTICLES: RECENT INSIGHTS IN STRUCTURE-PROPERTY RELATIONS

Jonathan Leliaert, Chair
Ghent University, Ghent, Belgium

SC-01. **Magnetic Nanoparticles: From the Nanostructure to the Physical Properties. *(Invited)*** X. Batlle[1,2], C. Moya[1,2], M. Escoda-Torroella[1,2], *O. Iglesias*[1,2], A. Fraile Rodríguez[1,2] and A. Labarta[1,2] *1. Física de la Matèria Condensada, Universitat de Barcelona, Barcelona, Spain; 2. Institut de Nanociència i Nanotecnologia de la UB (IN2UB), Barcelona, Spain*

SC-02. **Tuning the Intrinsic Features of Magnetic Nanoparticles and Exploiting their Assembly to Optimize the Response to External AC Fields for Magnetic Fluid Hyperthermia. *(Invited)*** H. Gavilán[1], K. Simeonidis[3], E. Myrovali[3], E. Mazarío[4], O. Chubykalo-Fesenko[5], R.W. Chantrell[6], L. Balcells[7], M. Angelakeris[3], M.d. Morales[5] and *D. Serantes*[2] *1. Universidad Complutense de Madrid, Madrid, Spain; 2. Universidade de Santiago de Compostela, Santiago de Compostela, Spain; 3. Aristotle University of Thessaloniki, Thessaloniki, Greece; 4. Universidad Autónoma de Madrid, Madrid, Spain; 5. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain; 6. University of York, Heslington, United Kingdom; 7. Institute of Materials Science of Barcelona, Barcelona, Spain*

SC-03. **Spin Disorder and Magnetic Morphologies in Magnetic Nanoparticles. *(Invited)*** *S. Disch*[1] *1. University of Duisburg-Essen, Essen, Germany*

SC-04. **Functional magnetic nanoparticles: from synthesis design to in-depth characterization and nano-labelling for ultrasensitive magnetic biosensing. *(Invited)*** R. Sack[1], M. Zgheib[1], M. Chowdhury[1], Y. Wang[1], F. Ludwig[1], M. Schilling[1], T. Viereck[1] and *A. Lak*[1] *1. Institute for Electrical Measurement Science and Fundamental Electrical Engineering, Technical University of Braunschweig, Braunschweig, Germany*

SC-05. **High-throughput determination of structure-property relationships of magnetic nanoparticles using a multi-detector chromatographic approach. *(Invited)*** *N. Löwa*[1], A. Remmo[1] and F. Wiekhorst[1] *1. Working Group "Metrology for Magnetic Nanoparticles", Physikalisch-Technische Bundesanstalt, Berlin, Germany*

SC-06. **Quantifying the magnetic anisotropy of individual nanomagnets embedded in biological entities.** ***(Invited)*** *L. Marcano*[1], I. Orue[2], D. Gandia[3], A. García-Prieto[4], M. Fernandez Gubieda[3] and S. Valencia[5] *1. Physics, University of Oviedo, Gijón, Spain; 2. SGIker, Universidad del País Vasco – UPV/EHU, Leioa, Spain; 3. Dpto. Electricidad y Electrónica, Universidad del País Vasco – UPV/EHU, Leioa, Spain; 4. Dpto. Física Aplicada, Universidad del País Vasco – UPV/EHU, Bilbao, Spain; 5. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany*

Session SD
LATEST ADVANCES IN MAGNETIC NANOTECHNOLOGY

Montserrat Rivas, Chair
Universidad de Oviedo, Gijón, Spain

SD-01. **Challenges in magnetic characterization at the nanoscale.** ***(Invited)*** E. Berganza[2], M. Jaafar[1], C. Bran[2], R. Perez Del Real[2], O. Chubykalo-Fesenko[2], M. Vázquez[2] and *A. Asenjo*[2] *1. Universidad Autónoma de Madrid, Madrid, Spain; 2. Institute of Materials Science of Madrid (ICMM-CSIC), Madrid, Spain*

SD-02. **Noncollinear Magnetism and Spintronics in van der Waals Magnets.** ***(Invited)*** *P. Upadhyaya*[1], M. Rahman[1], G. Cheng[2], A. Rustagi[1] and Y. Chen[1] *1. Purdue University, West Lafayette, IN, United States; 2. University of Science and Technology of China, Hefei, China*

SD-03. **Superconducting Resonators for Hybrid Magnonics.** ***(Invited)*** *V. Novosad*[1] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States*

SD-04. **Machine Learning Quantum Systems with Magnetic p-Bits.** ***(Invited)*** S. Chowdhury[1] and *K. Camsari*[1] *1. Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, CA, United States*

SD-05. **Nanoclustered Magnetic Josephson Junctions as Artificial Synapses.** ***(Invited)*** *E. Jué*[1,2] *1. National Institute of Standards and Technology, Boulder, CO, United States; 2. Physics, University of Colorado Boulder, Boulder, CO, United States*

SD-06. **Skyrmion Dynamics and the Skyrmion-Excited Spin Wave Fractal Network.** ***(Invited)*** *D. Gilbert*[1] *1. University of Tennessee, Knoxville, TN, United States*

Session SE
MODELING, DESIGN, CONSTRUCTION AND ANALYSIS OF ELECTRICAL MACHINES FOR SUSTAINABLE APPLICATIONS

Yacine Amara, Chair
Université Le Havre Normandie, Le Havre, France

SE-01. **Improving Repeatability of Tests for Iron Loss Prediction and Electrical Machines Model Calibration.** ***(Invited)*** J. Soulard[1], *E. Griffin*[1], X. Ma[1] and B. Silvester[1] *1. WMG, University of Warwick, Coventry, United Kingdom*

SE-02. **Robust Design of Permanent Magnet Motors for Electric Traction Applications.** ***(Invited)*** G.K. Sakkas[1] and *A.G. Kladas*[1] *1. Electrical and Computer Engineering, National Technical University of Athens, Athens, Greece*

SE-03. **Fast and Accurate Modelling of Laminated Cores in Electrical Machines using Homogenization and Neural Networks.** ***(Invited)*** F. Purnode[1], F. Henrotte[1], G. Louppe[1] and *C. Geuzaine*[1] *1. Department of Electrical Engineering and Computer Science, Université de Liège, Liège, Belgium*

SE-04. **3D printing of multipolar bonded SmCo permanent magnets.** ***(Invited)*** A. Vucemilovic[1], M. Savary[1] and *C. Espanet*[1] *1. Moving Magnet Technologies, BESANCON, France*

SE-05. **Analytical design and optimization of HTS electrical machines.** ***(Invited)*** *S. Mezani*[1] *1. Laboratoire GREEN, Université de Lorraine, Nancy, France*

SE-06. **Permanent Magnet Linear Machines with Asymmetrical Tooth Tip.** ***(Invited)*** *Q. Lu*[1], M. Zheng[1] and Y. Li[1] *1. College of Electrical Engineering, Zhejiang University, Hangzhou, China*

Session SF
NEW DESIGNS AND DEVELOPMENTS IN SOFT MAGNETIC MATERIALS AND MAGNETIC CORES FOR POWER ELECTRONICS TECHNOLOGY NEEDED FOR CARBON NEUTRAL SOCIETY

Masahiro Yamaguchi, Chair
Tohoku University, Sendai, Japan

SF-01. **Passive Components for Advancement of Power Electronics.** ***(Invited)*** *T. Shimizu*[1] *1. Electrical Engineering, Tokyo Metropolitan University, Hachioji, Japan*

SF-02. **Skin effect in iron-silicon steel sheets: from low inductions to saturation.** ***(Invited)*** *O. de la Barrière*[1], E. Ferrara[2], A. Magni[2], A. Sola[2], C. Ragusa[3], C. Appino[2] and F. Fiorillo[2] *1. SATIE, CNRS, University of Paris-Sud, Gif-sur-Yvette, France; 2. INRIM, Torino, Italy; 3. Energy, Politecnico di Torino, Torino, Italy*

SF-03. **Energy loss and constitutive equation of soft magnetic materials for broadband applications in power electronics.** ***(Invited)*** C. Ragusa[1], *L. Solimene*[1], S. Musumeci[1], O. de la Barrière[2], C. Beatrice[3], E. Ferrara[3] and F. Fiorillo[3] *1. Department of Energy, Politecnico di Torino, Torino, Italy; 2. Laboratoire SATIE, CNRS–ENS, Saclay, France; 3. Advanced Materials Metrology and Life Sciences, INRIM, Torino, Italy*

SF-04. **Challenges to high magnetic flux density and low loss magnetic materials and devices for next-generation power electronics.** ***(Invited)*** *S. Okamoto*[1], N. Ono[1], T. Onuma[1,2], Z. Li[1], Y. Uehara[2], A. Bolyachkin[3], H. Sepehri-Amin[3] and T. Ohkubo[3] *1. Tohoku University, Sendai, Japan; 2. Magnetic Device Laboratory Ltd., Kawasaki, Japan; 3. National Institute for Materials Science, Tsukuba, Japan*

SF-05. **Development of anisotropic nanocrystalline ribbon core and powdered core for high frequency transformers and inductors.** ***(Invited)*** *T. Sato*[1], T. Tada[1], T. Kanaya[1], M. Sonehara[1] and T. Mizuno[1] *1. Electrical and Computer Engineering, Shinshu University, Nagano, Japan*

SF-06. **Amorphous Metal Ribbon (AMR) & Metal Amorphous Nanocomposite (MANC) Materials Enabled High Power Density Vehicle Motor Applications.** ***(Invited)*** *M. McHenry*[1], K. Schneider[2], S. Simizu[1], J. Egbu[1], M.P. DeBoer[2] and E. Thiesen[3] *1. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Metglas, Conway, SC, United States*

Session SG
WHAT IS THE PLACE OF MAGNETIC MATERIALS IN TOMORROW'S CHIPS?

Paolo Bortolotti, Chair
Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France

SG-01. **Spin-Transfer Torque MRAM – Status and Outlook.** ***(Invited)*** *G. Hu[1] 1. IBM T.J. Watson Research Center, Yorktown Heights, NY, United States., Yorktown Heights, NY, United States*

SG-02. **Multi-Functionality in Magnetic Tunnel Junctions.** ***(Invited)*** *A. Jenkins*[1], L. Martins[1], L. Benetti[1], A. Schulman[1], P. Anacleto[1], M. Claro[1], T. Boehnert[1], E. Paz[1] and R. Ferreira[1] *1. International Iberian Nanotechnology Laboratory, Braga, Portugal*

SG-03. **Radio-Frequency Spintronic Neural Networks.** ***(Invited)*** A. Ross[1], N. Leroux[1], A. de Riz[1], D. Markovic[1], D. Sanz Hernandez[1], J. Trastoy[1], P. Bortolotti[1], D. Querlioz[2], L. Martins[3], L. Benetti[3], M. Claro[3], P. Anacleto[3], A. Schulman[3], T. Taris[4], J. Begueret[4], S. Saïghi[4], A. Jenkins[3], R. Ferreira[3], A. Vincent[4], A. Mizrahi[1] and *J. Grollier*[1] *1. CNRS Thales, Palaiseau, France; 2. Université Paris Saclay, Palaiseau, France; 3. International Iberian Nanotechnology Laboratory, Braga, Portugal; 4. University of Bordeaux, Bordeaux, France*

SG-04. **Spintronic logic: from transducers to logic gates and circuits.** ***(Invited)*** *C. Adelmann*[1], F. Ciubotaru[1], F. Meng[1,2], S. Cotofana[3] and S. Couet[1] *1. Imec, Leuven, Belgium; 2. ESAT, KU Leuven, Leuven, Belgium; 3. QCE, TU Delft, Delft, Netherlands*

SG-05. **Magnetism meet microelectromechanical systems.** ***(Invited)*** F. Maspero[1], S. Cuccurullo[2], G. Pavese[2], M. Cocconcelli[2], A. Del Giacco[2], A.E. Plaza[2], O. Koplak[2] and *R. Bertacco*[2,3] *1. Department of Environmental and Civil Engineering, Politecnico di Milano, Milano, Italy; 2. Department of Physics, Politecnico di Milano, Milano, Italy; 3. Institute for Photonics and Nanotechnologies, CNR-IFN, Milano, Italy*

SG-06. **A Collaboration from High Frequency Soft Magnetic Materials to Integrated Circuit Design for beyond 10MHz Switching Power Supply.** ***(Invited)*** *K. Miyaji*[1], M. Sonehara[1] and T. Sato[1] *1. Shinshu University, Nagano, Japan*

Session AOA
MAGNETORESISTANCE IN HETEROSTRUCTURES I

Jun'ichi Ieda, Chair
Japan Atomic Energy Agency, Tokai, Japan

AOA-01. **Magnetoresistance and Anomalous Hall Effect in Helical Eu Metallic Films.** N. Shrestha[1] and *J. Tang*[1] *1. Physics & Astronomy, University of Wyoming, Laramie, WY, United States*

AOA-02. **Autonomous material search for highly spin-polarized disordered material: Enhanced spin-polarization of CoFe upon Ag substitution.** *V.K. Kushwaha*[1], Y. Iwasaki[1], T. Nakatani[1], T. Sasaki[1], S. Kasai[1], K. Uchida[1] and Y. Sakuraba[1] *1. National Institute for Materials Science, Sengen, Japan*

AOA-03. **Room-temperature intrinsic ferromagnetism and magnetic manipulation of epitaxial $CrTe_2$ ultrathin films.** X. Zhang[1], W. Liu[2], L. He[3], R. Zhang[3], G. Bian[4], P. Li[5] and *Y. Xu*[3] *1. Shenzhen Institute for Quantum Science and Engr., Shenzhen, China; 2. Royal Holloway University of London, Surrey, United Kingdom; 3. Nanjing University, Nanjing, China; 4. University of Missouri, Columbia, MO, United States; 5. University of Science and Technology of China, Hefei, China*

AOA-04. **Negative spin polarization of Mn_2VGa Heusler alloy thin film studied in current-perpendicular-to-plane giant magnetoresistance devices.** *H. Suto*[1], V. Barwal[1], Z. Li[1], K. Masuda[1], T. Sasaki[1] and Y. Sakuraba[1] *1. Reserch Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

AOA-05. **Large spin-dependent scattering at half-metallic $Co_2FeGa_{0.5}Ge_{0.5}$ Heusler alloy and CoFe polycrystalline interface.** *D. Taparia*[1], T. Sasaki[1], T. Nakatani[1], H. Suto[1], Y. Miura[1], Z. Li[1], V.K. Kushwaha[1], I. Kazuumi[2], I. Shinto[2], N. Katsuyuki[2], S. Tomoyuki[2], S. Mitani[1] and Y. Sakuraba[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Advanced Products Development Center, Technology & Intellectual Property HQ, TDK Corporation, Chiba, Japan*

AOA-06. **Over 100% magnetoresistance in perpendicularly magnetized magnetic tunnel junctions with a Co_3Mn/Mo/CoFeB multilayer.** *T. Yamamoto*[1], T. Ichinose[1], J. Uzuhashi[2], T. Nozaki[1], T. Ohkubo[2], K. Yakushiji[1], S. Tamaru[1] and S. Yuasa[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

AOA-07. **Mo-Based Perpendicularly Magnetized Thin Films with Low Damping for Fast and Low-Power Consumption Magnetic Memory.** *H. Cheng*[1], Z. Boyu[1], Y. Xu[1], S. Eimer[1] and W. Zhao[1] *1. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China*

AOA-08. **CoCrMnZ (Z=Al, Ga, Si, Ge) Heusler Alloys: Potential Electrode Materials for MgO-based Magnetic Tunnel Junctions.** *T. Roy*[1], M. Tsujikawa[2] and M. Shirai[1,2] *1. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 2. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan*

AOA-09. **$Co_{90}Fe_{10}$/Mg-Al-O/$Co_{90}Fe_{10}$ magnetic tunnel junctions with a fully epitaxial fcc (111) structure.** *J. Song*[1,2], T. Scheike[1], C. He[1], Z. Wen[1], H. Sukegawa[1], T. Ohkubo[1], K. Hono[1] and S. Mitani[1,2] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Graduate School of Science and Technology, University of Tsukuba, Tsukuba, Japan*

AOA-10. **Nanosecond Superparamagnetic Tunnel Junctions Controlled by Spin-Transfer-Torque and Joule Heating.** *L. Schnitzspan*[1,2], M. Kläui[1,2] and G. Jakob[1,2] *1. Physics, Johannes Gutenberg University, Mainz, Germany; 2. Max Planck Graduate Center Mainz, Mainz, Germany*

AOA-11. **CoFeB/MgO/CoFeB-based magnetic tunnel junction using soft magnetic composite free layer with TaFeB spacer.** *T. Nakano*[1], K. Fujiwara[2], S. Kumagai[2], Y. Ando[1,3] and M. Oogane[1] *1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. Spin Sensing Factory Corporation, Sendai, Japan; 3. Department of Advanced Spintronics Medical Engineering, Tohoku University, Sendai, Japan*

AOA-12. **Theory for Temperature Dependence of Tunnel Magnetoresistance: Crucial Role of Interfacial *s-d* Exchange Interaction.** *K. Masuda*[1], T. Tadano[1] and Y. Miura[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

Session AOB
SPIN ORBITRONICS I

Hai Pham, Chair
Tokyo Institute of Technology, Tokyo, Japan

AOB-01. **Current-induced magnetization switching in magnetic multilayers with interlayer exchange coupling by dual spin-orbit torque.** *H. Masuda*[1,2], Y. Yamane[3,4], T. Seki[1,5], K. Raab[6], T. Dohi[6,4], R. Modak[5], K. Uchida[5,1], J. Ieda[7], M. Kläui[6] and K. Takanashi[1,7] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Department of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 4. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 5. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 6. Institute for Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 7. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

AOB-02. **Spin Hall Switching Enabled by Uniaxial In-Plane Magnetocrystalline Anisotropy.** *S. Nallan*[1] and J. Zhu[1] *1. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

AOB-03. **Intrinsic Orbital and Spin Hall Effect in Bismuth Semimetal.** *G. Qu*[1] and G. Tatara[1] *1. RIKEN, Wako-shi, Japan*

AOB-04. **Withdrawn**

AOB-05. **Time-Resolved Transitions Between Auto-Oscillation Modes in Nanoconstriction-based Spin Hall Nano-oscillators.** *A.A. Awad*[1], K. Wagner[2], A. Chaurasiya[1], V. Gonzalez[1], M. Rajabali[1], R. Khymyn[1], H. Schultheiss[2] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden–Rossendorf, Dresden, Germany*

AOB-06. **Emulation of Neuron and Synaptic Functions in Spin-Orbit Torque Domain Wall Devices.** *D. Kumar*[1], M. Ramu[1], H. Rahaman[1], H. Chung[2], T. Jin[1], S. Lim[2], R. Sbiaa[3] and S. Piramanayagam[1] *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore; 2. Institute of Materials Research and Engineering, Singapore, Singapore; 3. Department of Physics, Sultan Qaboos University, Muscat, Oman*

AOB-07. **The influence of superconductivity with spin-orbit coupling and magnetic interaction in ferromagnet/ superconductor heterostructures.** D. Zhao[1,2], Z. Zhao[1,2], Y. Xu[1,2] and *D. Wei*[1,2] *1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing, China*

AOB-08. **Fabrication and evaluation of fully sputtered topological insulator/perpendicularly magnetized CoFeB/MgO multilayers for SOT-MRAM application.** *R. Zhang*[1], T. Shirokura[1], F. Tuo[1] and H.N. Pham[1] *1. Electric and Electronic Engineering, Tokyo Institute of Technology, Oota, Japan*

AOB-09. **Large interfacial Rashba interaction and resultant dominating field-like torque in atomically thin metallic heterostructures.** *S. Krishnia*[1], N. Sebe[1], Y. Sassi[1], F. Ajejas[1], N. Reyren[1], S. Collin[1], T. Denneulin[2], A. Kovács[2], R.E. Dunin-Borkowski[2], A. Fert[1], J. George[1], H. Jaffrès[1] and V. Cros[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, 91767, Palaiseau, France; 2. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons (ER-C 1) and Peter Grünberg Institut (PGI-5), Forschungszentrum Jülich GmbH, 52425, Jülich, Germany*

AOB-10. **Evidence of orbital-torque in two–dimensional GeSe–based heterostructure.** *R. Mudgal*[3], S. Dewan[2], s. Das[1] and P.K. Muduli[3] *1. Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, New Delhi, New Delhi, India; 2. Indian Institute of Technology Delhi, New Delhi, India; 3. Department of Physics, Indian Institute of Technology Delhi, New Delhi, India*

AOB-11. **Efficient generation of spin currents by the orbital Hall effect in Cu and Al.** *A. Rothschild*[1], N. Am-Shalom[1], N. Bernstein[1], B.J. Assouline[1], J. Xiao[2], B. Yan[2] and A. Capua[1] *1. Applied Physics, The Hebrew University of Jerusalem, Jerusalem, Israel; 2. Weizmann Institute of Science, Rehovot, Israel*

AOB-12. **Field-free spin-orbit torque switching in perpendicularly magnetized synthetic antiferromagnets.** J. Wei[1], C. Wan[1], X. Han[1] and *G. Yu*[1] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China, Beijing, China*

Session AOC
SPIN ORBITRONICS II

Emilie Jué, Chair
National Institute of Standards and Technology, Boulder, CO, United States

AOC-01. **Growth, optimization, and electrical manipulation of rare-earth iron garnets for spintronic applications.** ***(Invited)*** *C.O. Avci*[1] *1. Institute of Materials Science of Barcelona (ICMAB-CSIC), Barcelona, Spain*

AOC-02. **Generalized angle resolved second harmonic method for precise evaluation of spin orbit torque in strong perpendicular magnetic anisotropy system.** *T. Shirokura*[1] and H.N. Pham[1] *1. Tokyo Institute of Technology, Meguro, Japan*

AOC-03. **Field-free switching enabled by interplay of spin-orbit torque and interlayer Dzyaloshinskii–Moriya interaction.** *W. He*[1,2], C. Wan[1] and X. Han[1] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Beijing, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing, China*

AOC-04. **Enhancement of Damping-Like Spin-Orbit-Torque Efficiency in Synthetic Antiferromagnetic System Using Pt-Cu Alloy.** *Y. Saito*[1], S. Ikeda[1,2], H. Inoue[1] and T. Endoh[1,3] *1. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 3. Department of Electrical Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan*

AOC-05. **Withdrawn**

AOC-06. **Emergence of considerable thermoelectric effect due to the addition of an underlayer in Pt/Co/Pt stack and its application in detecting field free magnetization switching.** *R. Posti*[1] *1. Physics, Indian Institute of Technology, Rupnagar, India*

AOC-07. **Emergent inductance in ferromagnetic nanostructures.** *J. Ieda*[1] *1. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

AOC-08. **Magnetic anisotropy and Dzyaloshinskii-Moriya interaction in Ru/Co/W/Ru films studied by XMCD and first principal calculations.** *A. Ognev*[1], A.S. Samardak[1], A. Kolesnikov[1], M. Stebliy[1], V.Y. Samardak[1], I. Iliushin[1], A. Pervishko[2], D. Yudin[2], M. Platunov[3,4], T. Ono[6], F. Wilhelm[5] and A. Rogalev[5] *1. Institute of High Technologies and Advanced Material, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Skolkovo Institute of Science and Technology, Moscow, Russian Federation; 3. Kirensky Institute of Physics, Krasnoyarsk, Russian Federation; 4. Synchrotron Radiation Facility SKIF, Kol'tsovo, Russian Federation; 5. ESRF-The European Synchrotron, Grenoble, France; 6. Kyoto University, Kyoto, Japan*

AOC-09. **Engineering of Pt/Co/Pt Interfacial Dzyaloshinskii-Moriya Interaction by Gd Dusting.** *F. Dörr*[1], C. Deger[2], M. Erkovan[3,4], S. Cardoso[3,4], P. Fumagalli[1] and Y. Shokr[1,5] *1. Institut für Experimentalphysik, Freie Universität Berlin, Berlin, Germany; 2. Department of Physics, Marmara University, Istanbul, Turkey; 3. Instituto de Engenharia de Sistemas E Computadores - Microsystemas e Nanotecnologias, Lisbon, Portugal; 4. Instituto Superior Tecnico, Lisbon, Portugal; 5. Department of Physics, Helwan University, Cairo, Egypt*

AOC-10. **Spin-Charge Interconversion at an Oxidized Cu/W Interface.** *I. Groen*[1,2], V. Pham[3], S. Ilic[4], W. Choi[1], A. Chuvilin[1,5], E. Sagasta[1], D. Vaz[1], I. Arango[1], N. Ontoso[1], F. Bergeret[4,6], L. Hueso[1,5], I. Tokatly[6,5] and F. Casanova[1,5] *1. CIC nanoGUNE BRTA, San Sebastian, Spain; 2. Department of Electronic Science and Engineering, Kyoto University, Kyoto, Japan; 3. CNRS, Instituut Neel, Université Grenoble Alpes, Grenoble, France; 4. Centro Mixto CSIC-UPV/EHU, Centro de Fisica de Materiales (CFM-MPC), San Sebastian, Spain; 5. Ikerbasque, Basque Foundation for Science, San Sebastian, Spain; 6. Donostia International Physics Center (DIPC)), San Sebastian, Spain*

AOC-11. **Field-free spin orbit torque switching of synthetic antiferromagnet through interlayer Dzyaloshinskii-Moriya interaction.** *Z. Wang*[1,2], X. Zhang[1,3], F. García Sánchez[4], A. Fert[5], B. Koopmans[2] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Eindhoven University of Technology, Eindhoven, Netherlands; 3. Truth Instrument Cooperation, Qingdao, China; 4. Universidad de Salamanca, Salamanca, Spain; 5. University of Paris-Saclay, Palaiseau, France*

Session APA
MAGNETORESISTANCE IN HETEROSTRUCTURES II (Poster Session)

Subhankar Bedanta, Chair
NISER, Bhubaneswar, Jatani, India

APA-01. **Observation of Magnetoresistance Caused by Orbital Angular Momentum Accumulation.** *Z. Zhu*[1], X. Xu[1], C. Li[1], C. Dou[1], M. Li[1], K. Meng[1], Y. Wu[1], J. Chen[1] and Y. Jiang[2] *1. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; 2. Institute of Quantum Materials and Devices, School of Electronic and Information Engineering; State Key Laboratory of Separation Membrane and Membrane Processes, Tiangong University, Tianjin, China*

APA-02. **Minority-Spin Dominated Band Structure of Fe_4N Thin Films Unveiled by Spin- and Angle- Resolved Photoelectron Spectroscopy.** *K. Nakanishi*[1], K. Ohwada[1], K. Kuroda[1], K. Sumida[3], K. Miyamoto[1], T. Okuda[1], H. Sato[1], S. Isogami[2], K. Masuda[2], Y. Sakuraba[2] and A. Kimura[1] *1. Hiroshima University, Higashi-Hiroshima, Japan; 2. National Institute for Materials Science (NIMS), Ibaraki, Japan; 3. Japan Atomic Energy Agency, Hyogo, Japan*

APA-03. **Crystal Direction Dependences of Anisotropic Magnetoresistance Effects in Co_2MnGa and Co_2MnAl Heusler Alloy Epitaxial Thin Films.** *T. Sato*[1], S. Kokado[2], M. Tsujikawa[3], H. Shinya[3,4], T. Ogawa[3], S. Kosaka[1], A. Miura[1], M. Shirai[3] and M. Tsunoda[3] *1. Toyota Central R&D Labs., Inc., Nagakute, Japan; 2. Shizuoka University, Hamamatsu, Japan; 3. Tohoku University, Sendai, Japan; 4. Osaka University, Toyonaka, Japan*

APA-04. **Large Tunnel Magnetocapacitance Effect in FeCo/MgAlO/FeCo(001) Magnetic Tunnel Junctions.** *Y. Shibata*[1], K. Sato[1], H. Sukegawa[2] and H. Kaiju[1,3] *1. Faculty of Science and Technology, Keio University, Yokohama, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Center for Spintronics Research Network, Keio University, Yokohama, Japan*

APA-05. **Room-Temperature Magnetoresistance in Nanojunctions Consisting of C8-BTBT Molecules Sandwiched Between Two Magnetic Thin-Film Edges.** *M. Matsuzaka*[1], Y. Sasaki[2], K. Hayashi[1], T. Misawa[2], T. Komine[3], T. Akutagawa[4], M. Fujioka[2], J. Nishii[2] and H. Kaiju[1,5] *1. Faculty of Science and Technology, Keio University, Yokohama, Japan; 2. Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan; 3. Graduate School of Science and Engineering, Ibaraki University, Hitachi, Japan; 4. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network, Keio University, Yokohama, Japan*

APA-06. **Magnetic tunnel junctions utilizing perpendicularly magnetized MnGa ultrathin films grown on sapphire substrate.** *N. Kamata*[1,2], S. Mizukami[2,3] and K. Suzuki[4,2] *1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Center for Science and Innovation in Spintronics (CSIS), Tohoku University, Sendai, Japan; 4. Advanced Science Research Center, Japan Atomic Energy Agency, Naka, Japan*

APA-07. **Prediction of High Tunnel Magnetoresistance Ratios in (111)-Oriented Junctions with a $SrTiO_3$ Barrier.** *K. Masuda*[1], H. Itoh[2], Y. Sonobe[3], H. Sukegawa[1], S. Mitani[1] and Y. Miura[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Kansai University, Suita, Japan; 3. Waseda University, Shinjuku, Japan*

APA-08. **Optimisation of perpendicular magnetic tunnel junction structures using scanning transmission electron microscopy.** *M. Smith*[3], C. Bull[3], M.C. Spink[1], P. Nutter[3], C.S. Allen[1,2], D. Hopkinson[1] and T. Thomson[3] *1. Electron Physical Science Imaging Centre (ePSIC), Diamond Light Source Ltd, Didcot, United Kingdom; 2. Department of Materials, University of Oxford, Oxford, United Kingdom; 3. Nano Engineering and Spintronic Technologies (NEST) group, Department of Computer Science, University of Manchester, Manchester, United Kingdom*

APA-09. **Extraordinary magnetoresistance in a 2-terminal structure.** *J. Létang*[1], S. Lumetti[1], P. Malagò[1], S.D. Costea[2], W. Heuer[3], J. Kosel[1] and M. Ortner[1] *1. Silicon Austria Labs GmbH, Villach, Austria; 2. Eaton European Innovation Center, Roztoky u Prahy, Czechia; 3. Eaton Industries GmbH, Vienna, Austria*

APA-10. **Sawtooth-like giant oscillation of tunnel magnetoresistance in epitaxial Fe/Mg_4Al-O_x/Fe(001) magnetic tunnel junctions.** *T. Scheike*[1], Z. Wen[1], S. Kasai[1], H. Sukegawa[1] and S. Mitani[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

APA-11. **Integrating magnetic tunnel junctions with femtosecond laser pulses.** *L. Wang*[1], W. Zhao[2], X.L. Lin[2], M. Heck[1] and B. Koopmans[1] *1. Eindhoven Hendrik Casimir Institute, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Fert Beijing Institute, MIIT Key Laboratory of Spintronics, Beihang University, Beijing, China*

POSTER SESSION

Session APB
SPIN-ORBITRONICS III (Poster Session)

Guoqiang Yu, Chair
Chinese Academy of Sciences, Beijing, China

APB-01. **Enhancement and Sign Reversal of the Spin Orbit Torque in Co/Pt Bilayers via Natural Oxidization of Co.** B. Wang[1], Y. Guo[1] and *J. Cao*[1] *1. School of Physical Science and Technology, Lanzhou Univercity, Lanzhou, China*

APB-02. **Gradient Dzyaloshiskii-Moriya interaction induced in Pt/Co films by Pt-Co alloy intralayers.** *A.S. Samardak*[5], J. Park[1,2], T. Kim[1], G. Kim[1], V. Bessonov[3], A. Telegin[3], I. Iliushin[5], A. Pervishko[4], D. Yudin[4], A. Samardak[5], A. Ognev[5], J. Cho[6] and Y. Kim[1] *1. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. Semiconductor R&D Center, Samsung Electronics Co. Ltd., Hwaseong, The Republic of Korea; 3. M. N. Mikheev Institute of Metal Physics, Ural Branch of Russian Academy of Science, Yekaterinburg, Russian Federation; 4. Skolkovo Institute of Science and Technology, Moscow, Russian Federation; 5. Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 6. Western Seoul Center, Korea Basic Science Institute, Seoul, The Republic of Korea*

APB-03. **Dzyaloshinskii–Moriya interaction effect on self spin-orbit torque in rare earth-transition metal alloy.** *P. Lee*[1], C. Lai[1] and S. Mangin[2] *1. Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. Physics, Institut Jean Lamour, Nancy, France*

APB-04. **Magneto-transport properties and magnetization switching in perpendicular magnetized Mn-rich Heusler alloy $Mn_{2.5}CoAl$.** *H. Qin*[1,3], X. Zhao[2], R. Han[1,3], H. Sun[1,3] and J. Zhao[1,3] *1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; 2. Dongguan University of Technology, Dongguan, China; 3. University of Chinese Academy of Sciences, Beijing, China*

APB-05. **Modulation of perpendicular magnetic anisotropy and spin-orbit torque switching behavior in $D0_{22}$-Mn_3Ga based heterostructures by interface engineering.** *H. Sun*[1,2], X. Zhao[1,3], S. Tong[1,2], R. Han[1,2], H. Qin[1,2] and J. Zhao[1,2] *1. State Key Laboratory of Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing, China; 3. International School of Microelectronics, Dongguan University of Technology, Dongguan, China*

APB-06. **Evidence of orbital current and orbital torques in transition metals using oxidized Cu light element.** B. Bony[1], *S. Krishnia*[1], S. Collin[1], J. George[1], N. Reyren[1], V. Cros[1] and H. Jaffrès[1] *1. Unité Mixte de Physique CNRS/ Thales, Palaiseau, France*

APB-07. **Spin-orbit torques of three spin polarizations in magnetic trilayers.** J. Ryu[1], R. Thompson[3], J. Park[1], *S. Kim*[1,2], G. Choi[1], J. Kang[1], H. Jeong[1], M. Kohda[3,4], J. Yuk[1], J. Nitta[3,4], K. Lee[2] and B. Park[1] *1. Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 3. Department of Materials Science, Tohoku University, Sendai, Japan; 4. Spintronics Research Network, Tohoku University, Sendai, Japan*

APB-08. **Femtosecond time-resolved ARPES study of the carrier relaxation in Bi doped graphene.** *Q. Liu*[1], X. Lu[1], Y. Liu[2], Z. Li[1], P. Yan[1], W. Chen[1], Q. Meng[1], Y. Zhang[1], C. Yam[3], L. He[1], Y. Yan[1], Y. Zhang[1], J. Wu[4], T. Frauenheim[2], R. Zhang[1] and Y. Xu[1] *1. Nanjing University, NanJing, China; 2. University of Bremen, Bremen, Germany; 3. University of Electronic Science and Technology of China, Shenzhen, China; 4. University of York, York, United Kingdom*

APB-09. **Magnetic Switching Properties for Synthetic Antiferromagntic Layers with Perpendicular Easy Magnetic Anisotropy.** *N. Tezuka*[1], S. Fujikawa[1], H. Akatani[1], M. Matsuura[1], S. Sugimoto[1] and Y. Saito[1] *1. Tohoku University, Sendai, Japan*

APB-10. **Magneto-optical detection of orbital Hall effect.** *K. Ko*[1], Y. Choi[1], D. Jo[2], D. Go[3,4], K. Kim[2], H. Park[5], C. Kim[6,7], G. Choi[1,8] and H. Lee[2,9] *1. Department of Energy Science, Sungkyunkwan University, Suwon, The Republic of Korea; 2. Department of Physics, Pohang University of Science and Technology, Pohang, The Republic of Korea; 3. Peter Grunberg Institut and Institute for Advanced Simulation, Forschungszentrum Julich and JARA, Julich, Germany; 4. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany; 5. Center for Spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea; 6. Department of Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea; 7. Center for Correlated Electron Systems, Institute for Basic Science, Seoul, The Republic of Korea; 8. Center for Integrated Nanostructure Physics, Institute for Basic Science, Suwon, The Republic of Korea; 9. Asia Pacific Center for Theoretical Physics, Pohang, The Republic of Korea*

APB-11. **Withdrawn**

APB-12. **Chiral interlayer exchange coupling for asymmetric domain wall propagation in field-free magnetization switching.** *J. Zhou*[1], L. Huang[1], H. Chung[1], J. Huang[2], T. Suraj[2], D.J. Lin[2], J. Qiu[1], S. Chen[1], S.L. Yap[1], Y. Toh[1], S. Ng[1], H. Tan[1], A. Soumyanarayanan[1,2] and S. Lim[1] *1. Institute of Materials Research and Engineering, A*STAR, Singapore, Singapore; 2. Physics, National University of Singapore, Singapore*

APB-13. **Withdrawn**

APB-14. **Domain-Wall Tilting Angle Dependence on Current Pulse Width.** *M. Kim*[1], L. Seong-Hyub[1], M. Kim[1] and S. Choe[1] *1. Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea*

POSTER SESSION

Session APC
SPIN ORBITRONICS IV
(Poster Session)

Weigang Wang, Chair
University of Arizona, Tucson, AZ, United States

APC-01. **Effect of non-uniform current density application in a heavy metal/ferrimagnet structure.** M. Bazrov[1], M. Stebliy[1], Z. Namsaraev[1], *M. Letushev*[1], A. Kozlov[1], V. Antonov[1], E. Stebliy[1], A. Davydenko[1], A. Ognev[1], Y. Shiota[2], A. Samardak[1] and T. Ono[1,2] *1. Laboratory of Spin-Orbitronics, Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Institute for Chemical Research, Kyoto, Japan*

APC-02. **Orbital chiral exchange interaction.** *R. Chen*[1], D. Go[2], Y. Mokrousov[2] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Forschungszentrum Julich, Jülich, Germany*

APC-03. **Implementation of Nonlocal Exchange Potential and Spin-orbit Coupling in First-principles Magnetic Property Calculation.** *T. Huang*[1] and Y. Tang[1] *1. National Central University, Taoyuan, Taiwan*

APC-04. **RKKY Coupling Effect on Coercivity of L10 FePt Thin-Film.** *E. Lim*[1], D. Jeong[1], W. Choi[1], S. Lee[1] and S. Kim[1] *1. Physics, University of Ulsan, Ulsan, The Republic of Korea*

APC-05. **Detection of noncollinear ordering in CoTb ferrimagnetic alloy under an action of spin orbit torque.** *Z. Namsaraev*[1], M. Bazrov[1], M. Letushev[1], V. Antonov[1], A. Ognev[1], A.S. Samardak[1] and M. Stebliy[1] *1. Laboratory of Spin-Orbitronics, Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation*

APC-06. **Withdrawn**

APC-07. **Type-Y magnetic tunnel junctions with CoFeB doped tungsten as spin current source.** *M. Zhao*[1], R. Zhang[1], C. Wan[1], X. Luo[1] and X. Han[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

APC-08. **Spin-orbit torque induced magnetization switching in perpendicularly magnetized MnGa/Fe bilayer grown on GaAs.** *M. Ogawa*[1], T. Hara[1], S. Hasebe[1], M. Yamanouchi[1] and T. Uemura[1] *1. Grad. School of Information Science and Technology, Hokkaido University, Sapporo, Japan*

APC-09. **Microscopic Calculation of Dzyaloshinskii-Moriya Interaction in a Rashba Ferromagnet.** *Y. Hayakawa*[1], Y. Imai[1] and H. Kohno[1] *1. Nagoya University, Nagoya, Japan*

APC-10. **Spin Orbit Torques Magnetization Switching In Tb/Gd/FeCo Multilayer.** *Y. Fujita*[1], D. Oshima[1], S. Takahashi[3], Y. Hirayama[3] and T. Kato[1,2] *1. Department of Electronics, Nagoya University, Nagoya, Japan; 2. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan; 3. Samsung Device Solutions R&D Japan, Samsung Japan Corporation, Yokohama, Japan*

APC-11. **Improvement of Spin-Orbit Torque Efficency for High Speed Operation of Tb/Co-Based Skyrmions.**
K. Tokunaga[1], Y. Kurokawa[1], L. Zhang[1], R. Satone[1] and H. Yuasa[1] *1. Kyushu University, Fukuoka, Japan*

APC-12. **Non-Volatile Electric-Field Control of Spin-Orbit Torques in Perpendicular Ferromagnet – $SrTiO_3$ System.**
A. Kandazoglou[1], *T. Frottier*[1], C. Grezes[1], M. Cosset-Cheneau[1], L. Vicente Arche[2], P. Sgarro[1], P. Noël[1,3], S. Teresi[1], M. Culot[1], L. Hutin[1], G. Prenat[1], S. Auffret[1], K. Garello[1], M. Bibes[2], L. Vila[1] and J. Attané[1] *1. Université Grenoble Alpes / CEA / IRIG/ SPINTEC, Grenoble, France; 2. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 3. Department of Materials, ETH Zurich, Zurich, Switzerland*

APC-13. **Separation of rare earth- and transition metal-contributions to the interfacial Dzyaloshinskii-Moriya interaction in ferrimagnetic Co-Gd alloys.** *Z. Zhao*[1], S. Dan[2], T. Lin[2], Z. Xie[1], D. Zhao[1], J. Zhao[1], N. Lei[2] and D. Wei[1] *1. Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; 2. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China*

Session BOA
CHIRALITY DRIVEN PHENOMENA IN NON-COLINEAR ANTIFERROMAGNETS

YoshiChika Otani, Chair
Tokyo Daigaku, Kashiwa, Japan

BOA-01. **Chirality-Driven Spintronic Device: Non-Collinear Antiferromagnet and Spin Selectivity. *(Invited)*** *S. Miwa*[1] *1. The Institute for Solid State Physics (ISSP), The University of Tokyo, Kashiwa, Japan*

BOA-02. **Current-Induced Field-Free Switching in Magnetic Multilayers with Interlayer Chiral Exchange.** *Y. Huang*[1], Y. Li[1], C. Huang[1], Y. Liu[1], W. Liao[1], T. Chen[1] and C. Pai[1] *1. Department of Material Science and Engineering, National Taiwan University, Taipei, Taiwan*

BOA-03. **Unconventional octupole dynamics of a non-collinear antiferromagnet driven by spin-orbit torque. *(Invited)*** *J. Yoon*[1,2], P. Zhang[2], C. Chou[2], Y. Takeuchi[1], T. Uchimura[1], J. Hou[2], J. Han[1], S. Kanai[1], H. Ohno[1], S. Fukami[1] and L. Liu[2] *1. Tohoku University, Sendai, Japan; 2. Massachusetts Institute of Technology, Cambridge, MA, United States*

BOA-04. **Electrical manipulation of fast magnetic octupole domain-wall motion in noncollinear antiferromagnets.** *M. Wu*[1,2], T. Chen[3], T. Nomoto[1], H. Isshiki[1], Y. Nakatani[4], T. Tomita[1], K. Kondou[2], R. Arita[1,2], S. Nakatsuji[1] and Y. Otani[1,2] *1. The University of Tokyo, Tokyo, Japan; 2. RIKEN, Wako, Japan; 3. Southeast University, Nanjing, China; 4. University of Electro-Communications, Tokyo, Japan*

BOA-05. **Magnetization Switching in Single Layer Non-Collinear Antiferromagnet Mn_3Sn.** *H. Xie*[1], X. Chen[1], Q. Zhang[1,2], Z. Mu[3], X. Zhang[2], B. Yan[4] and Y. Wu[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Department of Electrical and Electronic Engineering, Southern University of Science and Technology, Shenzhen, China; 3. State Key Laboratory of Functional Materials for Informatics, Chinese Academy of Sciences, Shanghai, China; 4. Department of Condensed Matter Physics, Weizmann Institute of Science, Rehovot, Israel*

BOA-06. **Tunneling Magnetoresistance in Noncollinear Antiferromagnetic Tunnel Junctions.** *J. Dong*[1], M. Zhu[1], E.Y. Tsymbal[2] and J. Zhang[1] *1. Physics, Hua Zhong University of Science and Technology, Wuhan, China; 2. Center for Materials and Nanoscience, University of Nebraska-Lincoln, Lincoln, NE, United States*

BOA-07. **Crystal Orientation Control of the Weyl Antiferromagnet Mn_3Sn in its Film Capped with a Tantalum Layer.** *T. Matsuo*[1], T. Higo[1,4], H. Tsai[1,4], D. Nishio-Hamane[2], K. Kondou[3,4], S. Miwa[2,4], Y. Otani[2,3] and S. Nakatsuji[1,2] *1. Department of Physics, The University of Tokyo, Bunkyo-ku, Japan; 2. ISSP, The University of Tokyo, Kashiwa, Japan; 3. RIKEN, Wako, Japan; 4. CREST, Saitama, Japan*

BOA-08. **Anomalous Hall effect induced by spin fluctuations in a triangular lattice antiferromagnet.** *M. Watanabe*[1], R. Asama[1], M. Tokuda[1], S. Suzuki[1], N. Jiang[1], H.K. Yoshida[2] and Y. Niimi[1] *1. Department of Physics, Osaka University, Toyonaka, Japan; 2. Department of Physics, Hokkaido University, Sapporo, Japan*

BOA-09. **Anisotropic spontaneous anomalous Hall effect in altermagnetic Mn_5Si_3 epitaxial films.** *M. Leiviskä*[1], R. Lopes Seeger[1], I. Kounta[2], H. Reichlova[3,5], L. Smejkal[6], S. Beckert[3], J. Rial[1], A. Badura[4], D. Kriegner[3,5], I. Joumard[1], E. Schmoranzerová[4], J. Sinova[6], T. Jungwirth[5], S. Goennenwein[7], L. Michez[2], O. Gomonay[6] and V. Baltz[1] *1. CEA-SPINTEC, Grenoble, France; 2. Aix-Marseille University, CNRS, CINaM, Marseille, France; 3. Institute of Solid State and Materials Physics, TU Dresden, Dresden, Germany; 4. Department of Chemical Physics and Optics, Charles University, Prague, Czechia; 5. Institute of Physics, Czech Academy of Sciences, Prague, Czechia; 6. Institute for Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 7. Department of Physics, University of Konstanz, Konstanz, Germany*

BOA-10. **Spin Hall angle of $L1_2$-ordered antiferromagnetic Mn_3Ir evaluated by terahertz emission spectroscopy.** *H. Mao*[1], Y. Sasaki[2], Y. Kobayashi[3,4], S. Isogami[2], T. Ono[3,4], T. Moriyama[3,4], Y. Takahashi[2] and K. Yamada[1] *1. Physics, Tokyo Institute of Technology, Tokyo, Japan; 2. National Institute for Materials Science, Tsukuba, Japan; 3. Institute for Chemical Research, Kyoto University, Uji, Japan; 4. Center for Spintronics Research Network, Kyoto University, Uji, Jamaica*

BOA-11. **Large anomalous Hall conductivity in compensated ferrimagnetic RFe_3 (R = Er, Dy, Tb) kagome magnets.** J. Liang[1,2], X. Xi[1], W. Wang[3] and *Y. Lau*[1,2] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. University of Chinese Academy of Sciences, Beijing, China; 3. School of Electronic and Information Engineering, Tiangong University, Tianjin, China*

BOA-12. **$Mn_{4-x}Ga_xN$ Thin Films for Ferrimagnetic Spintronics.** *L. Prendeville*[1], Y. He[1], P. Jimenez Cavero[1], S. Lenne[1], J. Coey[1] and K. Rode[1] *1. Trinity College Dublin, Dublin, Ireland*

Session BOB
MAGNONICS, INSULATRONICS, AND HEULSER ALLOYS

Martin Jourdan, Chair
Johannes Gutenberg University Mainz, Mainz, Germany

BOB-01. **Femtosecond coherent magnonic manipulation of antiferromagnetism. *(Invited)*** *D. Bossini*[1] *1. University of Konstanz, Konstanz, Germany*

BOB-02. **Quantum dynamics and transport of spins in magnets. *(Invited)*** *E. Saitoh*[1], T. Kikkawa[1], T. Hioki[2], H. Shimizu[1], Y. Shiomi[3], D. Hirobe[4] and J. Lustikova[2] *1. Department of Applied Physics, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan; 2. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Department of Basic Science, Graduate School of Arts and Sciences, The University of Tokyo, Tokyo, Japan; 4. Department of Physics, Shizuoka University, Shizuoka, Japan*

BOB-03. **Anisotropic long-distance magnon spin transport in the antiferromagnetic insulator YFeO3.** *E. Galindez Ruales*[1], S. Das[1], A. Ross[1], X. Ma[2], S. Becker[1], C. Schmitt[1], S. Filnov[1], F. van Duijn[3,4], F. Fuhrmann[1], M. Syskaki[1], U. Ebels[3], V. Baltz[3], A. Barra[4], H. Chen[2], G. Jakob[1], S. Cao[2], J. Sinova[1], O. Gomonay[1], R. Lebrun[5] and M. Kläui[1,6] *1. Institut für Physik, Johannes Gutenberg University, Mainz, Germany; 2. Department of Physics, Materials Genome Institute, International Center for Quantum and Molecular Structures, Shanghai University, Shangai, China; 3. Univ. Grenoble Alpes, CNRS, CEA, Grenoble INP, SPINTEC, CNRS, University of Paris-Sud, Grenoble, France; 4. Laboratoire National des Champs Magnetiques Intenses, CNRS-UGA-UPS-INSA-EMFL, Grenoble, France; 5. Unite Mixte de Physique CNRS, Thales, Universite Paris-Saclay, Palaiseau, France; 6. Center for Quantum Spintronics, Norwegian University of Science and Technology, Trondheim, Norway*

BOB-04. **Spin Current Transmission in (111) and (001) Crystal Oriented NiO Films Probed by Thermo-spin Effects.** *T. Yamazaki*[1], T. Seki[1] and K. Takanashi[1,2] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

BOB-05. **Spin structures in antiferromagnetic NiO/Pt bilayers.** H. Meer[1], *C. Schmitt*[1], L. Sanchez-Tejerina[2], O. Gomonay[1], S. Wust[3], R. Ramos[4], P. Herrgen[3], F. Schreiber[1], F. Fuhrmann[1], A. Ross[1], B. Bednarz[1], A. Rajan[1], S. Ding[1], M. Filianina[1], F. Maccherozzi[7], D. Backes[7], M. Foerster[8], M. Angel[8], F. Kronast[9], S. Valencia[9], M. Mohamad-Assaad[9], A. Kleibert[10], J. Sinova[1], M. Aeschlimann[3], G. Finocchio[6], E. Saitoh[5], L. Baldrati[1] and M. Kläui[1] *1. Johannes Gutenberg University, Mainz, Germany; 2. Universidad de Salamanca, Salamanca, Spain; 3. TU Kaiserslautern, Kaiserslautern, Germany; 4. Universidade de Santiago de Compostela, Santiago de Compostela, Spain; 5. The University of Tokyo, Tokyo, Japan; 6. University of Messina, Messina, Italy; 7. Diamond Light Source Ltd, Didcot, United Kingdom; 8. ALBA Synchrotron Light Facility, Barcelona, Spain; 9. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 10. Swiss Light Source, Paul Scherrer Institut, Villigen, Switzerland*

BOB-06. **Withdrawn**

BOB-07. **Sign Change of Spin-Orbit Torque in Pt/NiO/CoFeB Structures.** *Z. Dapeng*[1] and W. Zhao[1] *1. Beihang University, Beijing, China*

BOB-08. **Electric field control of interfacial antiferromagnetic moment in Pt/Cr_2O_3/Pt epitaxial trilayer.** *K. Ujimoto*[1], H. Sameshima[2], H. Sakurai[1], K. Toyoki[1], R. Nakatani[1] and Y. Shiratsuchi[1] *1. Osaka University, Suita, Japan; 2. Osaka University, Suita, Japan*

BOB-09. **Finite size effect and dimensional crossover in antiferromagnetic epitaxial Cr_2O_3 thin films.** *H. Sameshima*[1], K. Ujimoto[1], R. Tsutsumi[1], K. Toyoki[1,2], R. Nakatani[1,2] and Y. Shiratsuchi[1,2] *1. Graduate School of Engineering, Osaka University, Suita, Japan; 2. Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan*

BOB-10. **Withdrawn**

BOB-11. **Spin Transport, Unidirectional Bias and the Effect of Molecular Interfaces in a Metallic Antiferromagnet.** H. Vasili[1], S. Alotibi[1], M. Valvidares[2], P. Gargiani[2], M. Rogers[1], M. Ali[1], T. Moorsom[1], G. Burnell[1], B.J. Hickey[1] and *O. Cespedes*[1] *1. University of Leeds, Leeds, United Kingdom; 2. ALBA Synchrotron, Barcelona, Spain*

BOB-12. **Investigation on magnetic ordering of antiferromagnetic thin films by means of magnetoresistance effect measurement.** *S. Iguchi*[1], S. Fujiwara[1], K. Toyoki[1], Y. Shiratsuchi[1] and R. Nakatani[1] *1. Osaka University, Suita-shi, Japan*

BOB-13. **Tetragonal distortion induced giant perpendicular magnetic anisotropy in half-metallic Heusler alloy Mn_2FeGa.** P.D. Bentley[1], *S. Li*[1], K. Masuda[2], Y. Miura[2,5], Y. Du[1], T. Mitsui[1,3], K. Fujiwara[3], Y. Kobayashi[4], T. Guo[6], G. Yu[6,7], C. Suzuki[1], S. Yamamoto[1], F. Zheng[8], Y. Sakuraba[2] and S. Sakai[1] *1. National Institute for Quantum Science and Technology, Takasaki, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. National Institutes for Quantum Science and Technology, Sayo, Japan; 4. Institute for Integrated Radiation and Nuclear Science, Kyoto University, Kumatori, Japan; 5. Center for Spintronics Research Network, Osaka University, Osaka, Japan; 6. Songshan Lake Materials Laboratory, Dongguan, China; 7. Beijing National Laboratory for Condensed Matter Physics, Beijing, China; 8. School of Physics and Electronic-Electrical Engineering, Ningxia University, Yinchuan, China*

BOB-14. **Applicability Of Heusler 4d Alloys As Spin-Polarized Current Generators.** *D. Baigutlin*[1], V.V. Sokolovskiy[1] and V. Buchelnikov[1] *1. Condensed Matter Physics, Chelyabinsk State University, Chelyabinsk, Russian Federation*

Session BOC
SPIN TORQUES IN ANTIFERROMAGNETS

Jeffrey Bokor, Chair
University of California, Berkeley, CA, United States

BOC-01. **Geometric rotation of spin polarization for anisotropic and field-free spin orbit torque switching.** ***(Invited)***
C. Pan[1], Y. Lin[1], Y. Yang[2], S. Zhou[1] and *X. Qiu*[1] *1. School of Physics Science and Engineering, Tongji University, Shanghai, China; 2. School of Information Science and Technology, ShanghaiTech University, Shanghai, China*

BOC-02. **Spin-Orbit Torque-Induced Field-Free Switching of a Perpendicular Antiferromagnet.** *Z. Xu*[1], J. Ren[1], Z. Yuan[1], Y. Xin[1], X. Zhang[1] and Z. Zhu[1,2] *1. ShanghaiTech University, Shanghai, China; 2. Shanghai Engineering Research Center of Energy Efficient and Custom AI IC, Shanghaitech University, Shanghai, China*

BOC-03. **Demonstration of PtMn-based Field-Free Switching SOT MRAM.** *C. Lin*[1,2], C. Tseng[1], Y. Yen[1], C. Lai[1], K. Li[2], J. Shieh[2], J. Sun[2], J. Wei[3] and D. Tang[3] *1. Material Science, National Tsing Hua University, Hsinchu, Taiwan; 2. Taiwan Semiconductor Research Institute, Hsinchu, Taiwan; 3. Electronics and Optoelectronics Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan*

BOC-04. **Acoustically Assisted Field Free Spin Orbit Torque Magnetization Switching of Out of Plane Nano Magnet.**
P.K. Mishra[1], M. Sravani[1], S. M.[1] and S. Bhuktare[1]
1. Electrical Engineering, Indian Institute of Technology, Tirupati, India

BOC-05. **Current-induced Néel order switching facilitated by magnetic phase transition.** H. Wu[1], *H. Zhang*[3], B. Wang[4], Y. Guo[1], R. Cheng[3] and K. Wang[2] *1. Songshan Lake Materials Laboratory, Dongguan, China; 2. University of California, Los Angeles, Los Angeles, CA, United States; 3. University of California, Riverside, Riverside, CA, United States; 4. Ningbo University, Ningbo, China*

BOC-06. **Electrical switching of insulating antiferromagnet/heavy metal bilayers.** *C. Schmitt*[1], H. Meer[1], O. Gomonay[1], R. Ramos[2,3], A. Rajan[1], F. Schreiber[1], G. Beneke[1], A. Kumar[1], T. Sparmann[1], B. Bednarz[1], M. Foerster[4], M. Angel[4], J. Sinova[1], E. Saitoh[2,5], L. Baldrati[1] and M. Kläui[1,6]
1. Johannes Gutenberg University, Mainz, Germany; 2. Tohoku University, Sendai, Japan; 3. Universidad de Santiago, Santiago de Compostela, Spain; 4. ALBA Synchrotron Light Facility, Barcelona, Spain; 5. The University of Tokyo, Tokyo, Japan; 6. Graduate School of Excellence Materials Science in Mainz, Mainz, Germany

BOC-07. **Frequency-selective damping modulation induced by spin-orbit torque in a synthetic antiferromagnet/platinum heterostructure.** *S. Karube*[1], T. Hoshika[1], C. Zhang[1], M. Kohda[1] and J. Nitta[1] *1. Tohoku University, Sendai, Japan*

BOC-08. **Effect of an antiferromagnetic order on tailoring Dzyaloshinskii-Moriya interaction in Pt/Co/IrMn trilayer.** *S. Chen*[1], C. Yang[2] and C. Lai[1] *1. National Tsing Hua University, Hsinchu, Taiwan; 2. National Yang Ming Chiao Tung Universoty, Hsinchu, Taiwan*

BOC-09. **Simulation of the Back-Hopping Effect in Spin-Transfer Torque Driven Magnetic Tunnel Junctions Based on a Free-Electron Model.** *P. Flauger*[1,2], C. Abert[1] and D. Suess[1,2] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. University of Vienna Research Platform MMM Mathematics - Magnetism - Materials, Vienna, Austria*

BOC-10. **Prediction of Tunneling Magnetoresistance and Spin-Transfer Torque Effects in Antiferromagnetic Tunnel Junctions.** *D. Shao*[1], S. Zhang[2], Y. Jiang[1,3], J. Ding[4] and E.Y. Tsymbal[5] *1. Institute of Solid State Physics, HFIPS, Chinese Academy of Sciences, Hefei, China; 2. Beijing University of Chemical Technology, Bejing, China; 3. University of Science and Technology of China, Hefei, China; 4. Henan University of Engineering, Zhengzhou, China; 5. University of Nebraska, Lincoln, NE, United States*

BOC-11. **Tuning Spin-Orbit Torque Generation Via Seed/Heavy Metal Interface Modification.** *T. Jin*[1], G.J. Lim[1], H. Poh[1], S. Wu[1], F. Tan[1] and W. Lew[1] *1. Nanyang Technological University, Singapore, Singapore*

BOC-12. **Two-Terminal Magnetoresistance in Lateral Spin-Valve Devices: Scaling with Contact Resistance.** *A.M. Spiesser*[1], R. Jansen[1], H. Saito[1] and S. Yuasa[1] *1. Research Center for Emerging Computing Technologies, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

Session BOD
SWITCHING AND ULTRAFAST SPIN DYNAMICS IN ANTIFERROMAGNETS

Maciej Dabrowski, Chair
University of Exeter, Exeter, United Kingdom

BOD-01. **Ultrafast Spin-Orbit-Torque-Induced Coherent Magnetization Switching with Picosecond Current Pulses.** ***(Invited)*** *J. Bokor*[1,2], D. Polley[1,2], A. Pattabi[1], A. Rastogi[1], J. Hong[1], K. Jhuria[2,3], E. Díaz[3], A. Lemaitre[4], M. Hehn[3] and J. Gorchon[3] *1. EECS, University of California, Berkeley, Berkeley, CA, United States; 2. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. CNRS, Université de Lorraine, Nancy, France; 4. C2N, CNRS, Université Paris-Sud, Palaiseau, France*

BOD-02. **Manipulating exchange bias with a single femtosecond laser pulse.** *Z. Guo*[1,2]*, G. Malinowski[2], Z. Boyu[1], J. Wang[3], W. Zhang[1,2], H. Wang[1,2], Y. Peng[2], P. Vallobra[1], S. Mangin[2], W. Zhao[1] and M. Hehn[2] *1. Beihang University, Beijing, China; 2. Université de Lorraine, Nancy, France; 3. Guangdong University of Technology, Guangzhou, China*

BOD-03. **Writing information by current pulses in antiferromagnetic Mn_2Au.** *M. Jourdan*[1], S. Reimers[1], Y. Lytvynenko[1,2], Y. Niu[3], E. Golias[3], B. Sarpi[4], L. Veiga[4], T. Denneulin[5], A. Kovács[5], R.E. Dunin-Borkowski[5], J. Bläßer[1] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 2. Institute of Magnetism, NAS and MES of Ukraine, Kyiv, Ukraine; 3. MAX IV Laboratory, Lund, Sweden; 4. Diamond Light Source Ltd, Didcot, United Kingdom; 5. Forschungszentrum Julich, Julich, Germany*

BOD-04. **Switching of magnetization in synthetic antiferromagnet probed by time-resolved magneto-optical Kerr effect.** *M. Ma*[1], Z. Li[1], X. Ruan[1], J. Wu[2], R. Wang[1], J. Du[3], X. Lu[1] and Y. Xu[1,2] *1. School of Electronic Science and Engineering, Nanjing University, Nanjing, China; 2. Department of Electronic and Physics, The University of York, York, United Kingdom; 3. Department of Physics, Nanjing University, Nanjing, China*

BOD-05. **Ultrafast Magnetism of Antiferromagnets.** ***(Invited)*** *A. Kimel*[1] *1. Radboud University, Nijmegen, Netherlands*

BOD-06. **Revisiting a hidden order at an ferromagnet/ antiferromagnet interface and its switching dynamics.** *C. Yang*[1], S. Chen[2] and C. Lai[2] *1. National Chiao Tung Universoty, Hsinchu, Taiwan; 2. National Tsing Hua University, Hsinchu, Taiwan*

BOD-07. **Atomistic simulations of ultrafast, optically induced switching dynamics in antiferromagnets.** *T. Dannegger*[1], M. Berritta[2], K. Carva[3], P. Oppeneer[2] and U. Nowak[1] *1. University of Konstanz, Konstanz, Germany; 2. Uppsala University, Uppsala, Sweden; 3. Charles University in Prague, Prague, Czechia*

BOD-08. **Antiferromagnetic Droplet Soliton in a Nano-Contact Spin-Transfer Torque Oscillator.** *R. Khymyn*[1], R. Ovcharov[1], B. Ivanov[2,3] and J. Åkerman[1] *1. University of Gothenburg, Gothenburg, Sweden; 2. Institute of Magnetism of NASU and MESU, Kyiv, Ukraine; 3. Radboud University, Nijmegen, Netherlands*

BOD-09. **Exchange-spring-magnet-based spin-torque nano-oscillators.** *S. Jiang*[1,2], S. Chung[3], Q.T. Le[2] and J. Åkerman[2,4] *1. South China University of Technology, Guangzhou, China; 2. University of Gothenburg, Gothenburg, Sweden; 3. Korea National University of Education, Cheongju, The Democratic People's Republic of Korea; 4. KTH Royal Institute of Technology, Stockholm, Sweden*

BOD-10. **Microscopic theory of spin-transfer torques in antiferromagnets.** *J.J. Nakane*[1] and H. Kohno[1] *1. Nagoya University, Nagoya, Japan*

POSTER SESSION

Session BPA
ANTIFERROMAGNETIC SPINTRONICS (Poster Session)

Xuepeng Qiu, Co-Chair
Tongji University, Shanghai, China
Shinji Miwa, Co-Chair
The University of Tokyo, Kashiwa, Japan

BPA-01. **Ultrafast spin dynamics of non-collinear antiferromagnet Mn_3Sn driven by an optical spin-orbit torque.** *W. Lee*[1], B. Park[1], K. Lee[1] and G. Choi[2] *1. Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Sungkyunkwan University, Suwon, The Republic of Korea*

BPA-02. **Electrical Switching and Optical Detection of Néel Vectors in Antiferromagnets $NiPS_3$.** *Y. Chang*[1], M. Chen[1], T. Wu[1], D. Kim[2], R. Sankar[1], X. Li[2], K. Lin[1] and S. Lee[1] *1. Institute of Physics, Academia Sinica, Taipei, Taiwan; 2. Department of Physics and Center for Complex Quantum Systems, University of Texas at Austin, Austin, TX, United States*

BPA-03. **Role of Field-Like Torque in Magnetization Switching of CoTb alloys.** *H. Wang*[1,2], P. Vallobra[1,2], S. Peng[1,2] and W. Zhao[1,2] *1. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China; 2. Hefei Innovation Research Institute, Beihang University, Hefei, China*

BPA-04. **Exchange bias in Pd/Co/CoO films with perpendicular magnetic anisotropy.** *E. Tarasov*[1,2], V. Shatilov[1], I. Tkachenko[2] and A. Kozlov[1] *1. Far Eastern Federal University, Vladivostok, Russian Federation; 2. Institute of Chemistry FEB RAS, Vladivostok, Russian Federation*

BPA-05. **Magnetic proximity effect in antiferromagnetic composite thin films: impact of triggering perpendicular magnetic anisotropy.** *B. Wang*[1], T. Li[1], C. Hsiao[1], B. Liao[1], M. Tsai[1,2], T. Chuang[3] and D. Wei[3] *1. Department of Physics, National Changhua University of Education, Changhua, Taiwan; 2. Institute of Photonics Technologies, National Tsing Hua University, Hsinchu, Taiwan; 3. National Synchrotron Radiation Research Center, Hsinchu, Taiwan*

BPA-06. **Manipulation of exchange bias in perpendicularly magnetized IrMn/CoFeB/MgO structures.** *J. Liu*[1,2], S. Peng[1,2], J. Lu[1,2], D. Zhu[1], W. Li[1,2], J. Du[1], Z. Liu[1] and W. Zhao[1,2] *1. Fert Beijing Institute, School of Integrated Science and Engineering, Beijing Advanced Innovation Center for Big Data and Brain Computing, Beihang University, Beijing, China; 2. Hefei Innovation Research Institute, Beihang University, Beijing, China*

BPA-07. **Size dependence of critical current density and magnetization switching in CoFeB-based magnetic tunnel junction.** R. Phoomatna[1], A. Meo[1,2], R.W. Chantrell[3], J. Chureemart[1] and *P. Chureemart*[1] *1. Physics, Mahasarakham University, Kantarawichai, Thailand; 2. Electrical and Information Engineering, Politecnico of Bari, Bari, Italy; 3. Physics, University of York, York, United Kingdom*

BPA-08. **Enhanced spin torque efficiency in the W-CoFeB structures by metallic antiferromagnetic insertion.** *Q. Xia*[1], C. Wang[1], D. Zhu[1] and W. Zhao[1] *1. Beihang University, Beijing, China*

BPA-09. **NiO Insertion Effect on Spin-Orbit Torque in Pt/Co System.** *T. Morita*[1], T. Koyama[1,2] and D. Chiba[1,3] *1. SANKEN, Osaka Univ., Osaka, Japan; 2. PRESTO, JST, Saitama, Japan; 3. SRIS, Tohoku Univ., Sendai, Japan*

BPA-10. **Magnon-mediated magnetization switching in all oxide heterostructures.** *D. Zheng*[1] *1. King Abdullah University of Science and Technology (KAUST), Jedddah, Saudi Arabia*

BPA-11. **Algebraic decay of non-local spin transport in NiO.** *I. Sugiura*[1], Y. Kobayashi[1], K. Sugi[1], R. Hisatomi[1,2], Y. Shiota[1], T. Ono[1] and T. Moriyama[1,2] *1. ICR, Kyoto University, Uji, Japan; 2. PRESTO, JST, Kawaguchi, Japan*

BPA-12. **Spin dissipation in strained NiO (110) film.** *Y. Kobayashi*[1], I. Sugiura[1], Y. Shiota[1,2], T. Ono[1,2] and T. Moriyama[1,2] *1. Institute for Chemical Research, Kyoto University, Uji, Japan; 2. Center for Spintronics Research Network, Kyoto University, Uji, Japan*

BPA-13. **Spin Hall Magnetoresistance in Antiferromagnetic Insulators.** S. Geprägs[1], *M. Opel*[1], J. Fischer[1,2], P. Schwenke[1,3], M. Althammer[1,4], H. Huebl[1,4] and R. Gross[1,4] *1. Walther-Meissner-Institut, Bayerische Akademie der Wissenschaften, Garching, Germany; 2. CEA-SPINTEC, Grenoble, France; 3. RPTU Kaiserslautern Landau, Kaiserslautern, Germany; 4. TUM School of Natural Sciences, Technical University of Munich, Garching, Germany*

BPA-14. **Tailoring the spin transport in antiferromagnetic insulators.** E. Galindez Ruales[1], S. Filnov[1], C. Schmitt[1], *F. Fuhrmann*[1], M. Syskaki[1], G. Jakob[1], O. Gomonay[1] and M. Kläui[1,2] *1. Institut für Phisik, Johannes Gutenberg University, Mainz, Germany; 2. Center for Quantum Spintronics, Norwegian University of Science and Technology, Trondheim, Norway*

BPA-15. **Large Anisotropic Magnetoresistance of FeRh on Room Temperature and its Phase Diagram.** *W. Won*[1], M. Park[2], T. Lee[1] and K. Kim[1] *1. Physics, KAIST, Daejeon, The Republic of Korea; 2. Physics, Sogang University, Seoul, The Republic of Korea*

BPA-16. **Investigation of Hall contribution in FeCo-compensated ferrimagnetic novel structures.** L. Ye[1,2], *R.C. Bhatt*[1,2], N. Huang[1,2] and T. Wu[1,2] *1. Graduate School of Materials Science, National Yunlin University of Science and Technology, Douliu, Taiwan; 2. Taiwan SPIN Research Center, National Yunlin University of Science and Technology, Douliu, Taiwan*

BPA-17. **Phase Field Modelling of Magnetoelasticity in Antiferromagnets.** *R.A. Mackay*[1,2], J. Barker[1,2] and S. Fitzgerald[2,3] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. The Bragg Centre for Materials Research, Leeds, United Kingdom; 3. School of Mathematics, University of Leeds, Leeds, United Kingdom*

BPA-18. **Microscopic Theory of Spin Motive Force in Antiferromagnets.** *S. Hirata*[1], Y. Toda[1] and H. Kohno[1] *1. Department of Physics, Nagoya University, Nagoya, Japan*

BPA-19. **The transition from soft to hard exchange bias and oscillation of biasing field with the variation of IrMn thickness.** *A. Joy*[1], S. Kayal[1] and P. Anil Kumar[1] *1. Physics, Indian Institute of Science Bangalore, Bangalore, India*

BPA-20. **Vertical long pillar magnetic memory with two magnetic junctions.** *S. Honda*[1] and Y. Sonobe[2] *1. Department of Pure and Applied Physics, Kansai University, Suita, Japan; 2. Research Organization for Nano & Life Innovation, Waseda University, Shinjuku, Japan*

ORAL SESSIONS

Session COA
SKYRMION DETECTION, CONTROL, AND COMPUTING

Wanjun Jiang, Chair
Tsinghua University, Beijing, China

COA-01. **Electrical detection of magnetic skyrmions in a magnetic tunnel junction.** Y. Guang[1], G. Finocchio[2], X. Han[1] and *G. Yu*[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. University of Messina, Messina, Italy*

COA-02. **Driving skyrmions with high mobility in synthetic ferrimagnets.** *S. Mallick*[1], N. Figueiredo-Prestes[1], Y. Sassi[1], N. Reyren[1], K. Bouzehouane[1], S. Krishnia[1], V. Jeudy[2], A. Thiaville[2], T. Denneulin[3], R.E. Dunin-Borkowski[3], V. Cros[1] and A. Fert[1] *1. Unite Mixte de Physique, CNRS, Thales, Palaiseau, France; 2. Laboratoire de Physique des Solides, Orsay, France; 3. Forschungszentrum Julich, Julich, Germany*

COA-03. **Encoding and Multiplexing Information Signals in Magnetic Multilayers with Fractional Skyrmion Tubes.** R. Chen[1], Y. Li[1], Y. Zang[1], *W. Griggs*[1], V. Pavlidis[1] and C. Moutafis[1] *1. Department of Computer Science, University of Manchester, Manchester, United Kingdom*

COA-04. **Static and dynamic control of skyrmion chirality in low DMI systems.** *J. Fischer*[1], C. Fillion[1], C. Gueneau[1], F. Ibrahim[1], L. Vojáček[1], A. Fassatoui[2], S. Pizzini[2], L. Ranno[2], L. Cagnon[2], D. Ourdani[3], M. Belmeguenai[3], Y. Roussigné[3], S. Chérif[3], S. Auffret[1], I. Joumard[1], O. Boulle[1], G. Gaudin[1], M. Chshiev[1], L.D. Buda-Prejbeanu[1], C. Baraduc[1] and H. Béa[1] *1. CEA-SPINTEC, Grenoble, France; 2. Institut Néel CNRS, Grenoble, France; 3. LSPM, Villetaneuse, France*

COA-05. **Electric Field Controlled Mechanism for the Deflection of Skyrmions.** *S.H. Moody*[1], M. Littlehales[1], J.S. White[2], D. Mayoh[3], G. Balakrishnan[3], D. Alba Venero[4] and P. Hatton[1] *1. Condensed Matter Physics, Durham University, Durham, United Kingdom; 2. Neutron Scattering and Imaging (LNS), Paul Scherrer Institut, Villigen, Switzerland; 3. Physics, University of Warwick, Warwick, United Kingdom; 4. ISIS Neutron and Muon Source, Didcot, United Kingdom*

COA-06. **Reading and Writing Skyrmions in a Magnetic Tunnel Junction.** *A. Soumyanarayanan*[1,2] *1. A*STAR Institute of Materials Research and Engineering, Singapore, Singapore; 2. Physics, National University of Singapore, Singapore*

COA-07. **Skyrmion nucleation in thin films of an antiferromagnet for the next generation spintronic devices.** ***(Invited)*** *M. Leiviskä*[1], S. Jenkins[2], D. Gusakova[1], R.F. Evans[2] and V. Baltz[1] *1. SPINTEC, Grenoble, France; 2. Physics, University of York, York, United Kingdom*

COA-08. **Reservoir Computing with Spin Waves in a Skyrmion Crystal.** *M. Lee*[1] and M. Mochizuki[1] *1. Applied Physics, Waseda University, Shinjuku, Japan*

COA-09. **Spatial Metrics for Advancing Skyrmion Reservoir Computing.** *R. Msiska*[1], J. Love[1], J. Mulkers[2], J. Leliaert[2] and K. Everschor-Sitte[1,3] *1. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2. Department of Solid state sciences, Ghent University, Ghent, Belgium; 3. Center for Nanointegration Duisburg-Essen (CENIDE), Duisburg, Germany*

COA-10. **Non-conventional computing using thermal and driven skyrmion dynamics.** M.A. Brems[1], *K. Raab*[1], J. Zázvorka[2], G. Beneke[1], T. Winkler[1], J. Rothörl[1], F. Kammerbauer[1], P. Virnau[1], J. Mentink[3] and M. Kläui[1] *1. Institute for Physics, Johannes Gutenberg University, Mainz, Germany; 2. Institute of Physics, Charles University in Prague, Prague, Czechia; 3. Institute for Molecules and Physics, Radboud University, AJ Nijmegen, Netherlands*

COA-11. **Demonstration of weighted sum using electrical manipulation and detection of magnetic skyrmions.** *T. da Câmara Santa Clara Gomes*[1], Y. Sassi[1], S. Krishnia[1], D. Sanz Hernandez[1], N. Reyren[1], M. Martin[1], P. Seneor[1], T. Bhatnagar-Schöffmann[2], D. Ravelosona[2], D. Querlioz[2], L. Herrera Diez[2], J. Grollier[1] and V. Cros[1] *1. Unité Mixte CNRS-Thales, Université Paris Saclay, Palaiseau, France; 2. Centre de Nanosciences et de Nanotechnologies, Palaiseau, France*

COA-12. **Experimental demonstration of skyrmionic magnetic tunnel junction and its on-chip learning application.** *S. Li*[1], A. Du[1], Y. Wang[2], X. Wang[1], S. Liu[1], Z. Zhang[1], B. Pan[1], W. Kang[1], Z. Wang[1], Z. Hou[2] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. South China Normal University, Guangzhou, China*

COA-13. **Nucleation, stabilization, annihilation, and transformation of topological spin textures for reservoir computing.** *X. Liu*[1] *1. Department of Electrical and Computer Engineering, Shinshu University, Nagano, Japan*

COA-14. **Experimental Demonstration of a Skyrmion-Enhanced Straintronic Physical Reservoir Computing System.** N. Lei[1] and *Y. Sun*[1] *1. Beihang University, Beijing, China*

ORAL SESSIONS

Session COB
SKYRMION MATERIALS AND ENGINEERING

Shawn Pollard, Chair
The University of Memphis, Memphis, TN, United States

COB-01. **Toggle-like Current-Induced Bloch Point Dynamics of 3D Skyrmion Strings in a Room Temperature Nanowire.** *M. Birch*[1], D. Cortés-Ortuño[2], K. Litzius[1], S. Wintz[1], F. Schulz[1], M. Weigand[3], A. Stefancic[4], D. Mayoh[4], G. Balakrishnan[4], P. Hatton[5] and G. Schütz[1] *1. Modern Magnetic Materials, Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 2. Department of Earth Sciences, Utrecht University, Utrecht, Netherlands; 3. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany; 4. Department of Physics, University of Warwick, Coventry, United Kingdom; 5. Department of Physics, Durham University, Durham, United Kingdom*

COB-02. **A weakly pinned skyrmion liquid in a magnetic heterostructure.** *R. Mansell*[1], Y. Zhou[1], K. Kohvakka[1], S. Ying[2], K.R. Elder[3], E. Granato[4] and T. Ala-Nissila[1,5] *1. Department of Applied Physics, Aalto University, Espoo, Finland; 2. Department of Physics, Brown University, Providence, RI, United States; 3. Department of Physics, Oakland University, Rochester, MI, United States; 4. Laboratório Associado de Sensores e Materiais, Instituto Nacional de Pesquisas Espaciais, São José dos Campos, Brazil; 5. Interdisciplinary Centre for Mathematical Modelling and Department of Mathematical Sciences, Loughborough University, Loughborough, United Kingdom*

COB-03. **Observation of antiferromagnetic merons and antimerons in synthetic antiferromagnets.** *M. Bhukta*[2], T. Dohi[2,1], V. Bharadwaj[2], R. Zarzuela[2], M. Syskaki[2,3], J. Sinova[2], R. Frömter[2] and M. Kläui[2] *1. Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, RIEC, Tohoku University, Sendai 980-8577, Japan, Japan; 2. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 3. Singulus Technologies AG, Kahl am Main, Germany*

COB-04. **Chiral spintronics.** ***(Invited)*** *S. Parkin*[1] *1. Max Planck Institute for Microstructure Physics, Halle, Germany*

COB-05. **Correlation between Hall effect and skyrmion density in CoFeB based skyrmion multilayers.** *Y. Kumar*[1], H.C. Chauhan[1], N. Reyren[2], S. Krishnia[2], T. Srivastava[2], V. Cros[2] and P. Das[1] *1. Physics, Indian Institute of Technology, New Delhi, India; 2. Unite Mixte de Physique, CNRS, Thales, Palaiseau, France*

COB-06. **Double heterostructure introduction in Pt/Ni/Co system for skyrmion with small size and fast transport.** *L. Zhang*[1], K. Tokunaga[1], Y. Kurokawa[1], R. Satone[1], T. Tamaoka[2], Y. Tomita[2], Y. Murakami[2,3] and H. Yuasa[1] *1. Graduate School of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan; 2. The Ultramicroscopy Research Center, Kyushu University, Fukuoka, Japan; 3. Department of Applied Quantum Physics and Nuclear Engineering, Kyushu University, Fukuoka, Jamaica*

COB-07. **Observation of Liquid-Like Skyrmion Phase in FeGe.** *M. Littlehales*[1,2], S.H. Moody[1], B. Brereton[1], G. Balakrishnan[3], H. Popescu[4], N. Jaouen[4] and P. Hatton[1] *1. Department of Physics, Durham University, Durham, United Kingdom; 2. ISIS Neutron and Muon Source, Oxford, United Kingdom; 3. Department of Physics, University of Warwick, Coventry, United Kingdom; 4. SEXTANTS, Synchrotron SOLEIL, Saint-Aubin, France*

COB-08. **Demonstration of a Thickness-Step Skyrmion Injector in FeGe.** M. Wilson[1,2], *M. Littlehales*[2,3], S.H. Moody[2], L. Turnbull[2], B. Huddart[2], B. Brereton[2], G. Balakrishnan[4], P. Steadman[5], R. Fan[5] and P. Hatton[2] *1. Department of Physics and Physical Oceanography, Memorial University of Newfoundland, St. John's, NL, Canada; 2. Department of Physics, Durham University, Durham, United Kingdom; 3. ISIS Neutron and Muon Source, Oxford, United Kingdom; 4. Department of Physics, University of Warwick, Coventry, United Kingdom; 5. Diamond Light Source Ltd, Oxford, United Kingdom*

COB-09. **Topological Transformation of Magnetic (Anti)Skyrmions via Thermal Current.** *F.S. Yasin*[1], J. Masell[1,2], K. Karube[1], D. Shindo[1], Y. Taguchi[1], Y. Tokura[1,3] and X. Yu[1] *1. Center for Emergent Matter Science (CEMS), RIKEN, Wako, Japan; 2. Institute of Theoretical Solid State Physics, Karlsruhe Institute of Technology, Karlsruhe, Germany; 3. Department of Applied Physics, The University of Tokyo, Tokyo, Japan*

COB-10. **Coexistence of distinct spin textures beyond skyrmions.** *B. Göbel*[1], J. Jena[2], I. Mertig[1] and S. Parkin[2] *1. Martin-Luther-University Halle-Wittenberg, Halle, Germany; 2. Max Planck Institute of Microstructure Physics, Halle, Germany*

COB-11. **Large Dzyaloshinskii-Moriya interaction and room-temperature nanoscale skyrmions in CoFeB/MgO heterostructures.** R. Chen[1], *X. Wang*[1], H. Cheng[1], K. Lee[2], M. Kläui[2], H. Yang[3], S. Peng[1], X. Zhang[1] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Johannes Gutenberg University Mainz, Mainz, Germany; 3. Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China*

COB-12. **Suppression of skyrmion Hall effect via standing surface acoustic waves in hybrid ferroelectric/ferromagnetic heterostructures.** *C. Chen*[1], D. Wei[2] and N. Lei[1] *1. Beihang University, Beijing, China; 2. Institute of Semiconductors Chinese Academy of Sciences, Beijing, China*

COB-13. **Stack engineering of antiferromagnetic skyrmion dynamics from bi-layer skyrmions to skyrmion tubes.** *T. Dohi*[1,2], M. Bhukta[2], F. Kammerbauer[2], M. Syskaki[1,3], K. Raab[2], M. Weißenhofer[4], S. Wintz[5], R. Frömter[2], G. Jakob[2], U. Nowak[4] and M. Kläui[2] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Institut für Physik, Johannes Gutenberg-Universität Mainz, Mainz, Germany; 3. Singulus Technologies AG, Hanauer, Germany; 4. Fachbereich Physik, Universität Konstanz, Konstanz, Germany; 5. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany*

COB-14. **Withdrawn**

COB-15. **Withdrawn**

Session COC
SPINS IN 2D MATERIALS

Safeer Chenattukuzhiyil, Chair
University of Oxford, Oxford, United Kingdom

COC-01. **Single-Atomic-Layer Stanene on Ferromagnetism Co Nanoislands with Nontrivial Band Topology.** *C. Chen*[1], Y. Chao[2], Y. Lin[1], Y. Zhuang[1], Y. Lai[3], S. Huang[1], A.H. McDonald[4], C. Shih[4], B. Wang[3], J. Su[2] and P. Hsu[1] *1. Department of Physics, National Tsing Hua University, Hsinchu, Taiwan; 2. Department of Electrophysics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 3. Department of Physics, National Changhua University of Education, Changhua, Taiwan; 4. Department of Physics, The University of Texas at Austin, Austin, TX, United States*

COC-02. **Yu-Shiba-Rusinov States of Fe Atoms on Ni Kagome Lattice on Pb(111).** *Y. Lin*[1], N. Kumar[1], T. Lin[1], J. Xiao[1], C. He[1] and P. Hsu[1] *1. Department of Physics, National Tsing Hua University, Hsinchu, Taiwan*

COC-03. **Ferromagnetism modulation by ultralow current in a two-dimensional polycrystalline molybdenum disulfide atomic layered structure.** *I. Muneta*[1], T. Shirokura[2], H.N. Pham[2], K. Kakushima[1], K. Tsutsui[1] and H. Wakabayashi[1] *1. Tokyo Institute of Technology, Yokohama, Japan; 2. Tokyo Institute of Technology, Tokyo, Japan*

COC-04. **Spin Logic and Emergent Spin Phenomena in 2D Materials Heterostructures.** ***(Invited)*** *S.P. Dash*[1] *1. Chalmers University of Technology, Gothenburg, Sweden*

COC-05. **Graphene-Supported Atom-Sized Magnets for Data Storage: What Can We Learn from First-Principles Calculations?** J. Navratil[1,2], R. Langer[1,2], M. Otyepka[1,3], T. Susi[4] and *P.S. Blonski*[1] *1. Regional Centre of Advanced Technologies and Materials, Czech Advanced Technology and Research Institute (CATRIN), Palacký University Olomouc, Olomouc, Czechia; 2. Department of Physical Chemistry, Faculty of Science, Palacký University Olomouc, Olomouc, Czechia; 3. IT4Innovations, Technical University of Ostrava, Ostrava, Czechia; 4. Faculty of Physics, University of Vienna, Vienna, Austria*

COC-06. **Anomalous Zeeman shift of defect-bound states in epitaxial FeSn films.** *L. Li*[1] and H. Zhang[1] *1. Physics and Astronomy, West Virginia University, Morgantown, WV, United States*

COC-07. **Spin transport in CrXY monolayers: multiscale computational study.** *L. Vojáček*[1], J.H. Garcia[2], J.E. Medina Dueñas[2], F. Ibrahim[1], S. Roche[2,3], J. Li[4] and M. Chshiev[1,5] *1. CEA-SPINTEC, Grenoble, France; 2. ICN2, Barcelona, Spain; 3. ICREA, Barcelona, Spain; 4. Leti, Grenoble, France; 5. Institut Universitaire de France, Paris, France*

COC-08. **Role of Er Doping in Observed Superconductivity of Non-Centrosymmetric YPdBi Half-Heusler Non-Trivial Thin Films.** *S. Srivastava*[1], B. Das[2], V. Bhardwaj[3], A. Alam[2] and R. Chatterjee[1] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India; 2. Physics, Indian Institute of Technology Bombay, Mumbai, India; 3. Department of Condensed Matter Physics, Weizmann Institute of Science, Rehovot, Israel*

COC-09. **Magnetization and Spin Dynamics in Two-Dimensional Magnets.** L. Alahmed[1], B. Nepal[2], J. Macy[3], B. Casas[3], A. Sapkota[2], A. Mazza[4], M. Brahlek[4], J. Wen[5], W. Jin[1], S. Zhang[6], C. Mewes[2], L. Zhang[7], Y. Mokrousov[7,12], W. Zhang[10], Y. Lee[5,8], L. Balicas[3], T. Mewes[2], X. Zhang[11] and *P. Li*[9] *1. Auburn University, Auburn, AL, United States; 2. University of Alabama, Tuscaloosa, AL, United States; 3. Florida State University, Tallahassee, FL, United States; 4. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 5. SLAC National Accelerator Laboratory, Menlo Park, CA, United States; 6. Case Western Reserve University, Cleveland, OH, United States; 7. Forschungszentrum Jülich and JARA, Jülich, Germany; 8. Stanford University, Palo Alto, CA, United States; 9. University of Science and Technology of China, Hefei, China; 10. University of North Carolina, Chapel Hill, NC, United States; 11. Southern University of Science and Technology, Shenzhen, China; 12. Johannes Gutenberg University Mainz, Mainz, Germany*

COC-10. **Unconventional Anomalous Hall Effect in Cr_2Te_3 Thin Films.** M. Bian[1,2], K. He[3], S. Seddon[4], P. Milde[4], C. Huai[1], J. Zang[5], R. Sabirianov[6], J. Bird[3], X. Cheng[7], G. Miao[8], L. Eng[4], Y. Hou[2] and *H. Zeng*[1] *1. Department of Physics, University at Buffalo, the State University of New York, Buffalo, NY, United States; 2. School of Materials Science and Engineering, Peking University, Beijing, China; 3. Department of Electrical Engineering, University at Buffalo, the State University of New York, Buffalo, NY, United States; 4. Institut für Angewandte Physik, Technische Universität Dresden, Dresden, Germany; 5. Department of Physics, University of New Hampshire, Durham, NH, United States; 6. Department of Physics, University of Nebraska-Omaha, Omaha, NE, United States; 7. Department of Physics, Bryn Mawr College, Bryn Mawr, PA, United States; 8. Department of Electrical Engineering, University of Waterloo, Waterloo, ON, Canada*

COC-11. **Proximity effects in molecular beam epitaxy grown van der Waals ferromagnet Cr_2Te_3 on two-dimensional layers.** *Q. Guillet*[1], H. Boukari[2], L. Vojáček[1], D. Dosenovic[3], H. Okuno[3], F. Ibrahim[1], J. Li[4], C. Vergnaud[1], A. Marty[1], F. Bonell[1], M. Chshiev[1] and M. Jamet[1] *1. Univ. Grenoble Alpes, CEA, CNRS, IRIG-SPINTEC, Grenoble, France; 2. Univ. Grenoble Alpes, CNRS, Institut Neel, Grenoble, France; 3. Univ. Grenoble Alpes, CEA, CNRS, IRIG-MEM, Grenoble, France; 4. CEA, LETI, Univ. Grenoble Alpes, Grenoble, France*

Session COD
SPINS IN GRAPHENE AND TOPOLOGICAL MATERIALS

Yi Wang, Chair
Dalian University of Technology, Dalian City, India

COD-01. **Disentangling magnetic proximity effects in magnetic insulator-topological insulator thin film heterostructures.** ***(Invited)*** *L. Riddiford*[1,2], A.J. Grutter[3], T. Pillsbury[4], M. Stanley[4], D. Reifsnyder Hickey[5], P. Li[2], N. Alem[5], N. Samarth[4] and Y. Suzuki[1,2] *1. Department of Applied Physics, Stanford University, Stanford, CA, United States; 2. Geballe Lab for Advanced Materials, Stanford University, Stanford, CA, United States; 3. National Institute of Standards and Technology, Gaithersburg, MD, United States; 4. Department of Physics, The Pennsylvania State Univeristy, State College, PA, United States; 5. Department of Materials Science, The Pennsylvania State Univeristy, State College, PA, United States*

COD-02. **Spin-Sensitive Epitaxial In_2Se_3 Tunnel Barrier in In_2Se_3/Bi_2Se_3 Topological Van der Waals Heterostructure.** *C. Li*[1], J. Moon[1], O.M. van't Erve[1], D. Wickramaratne[1], E. Cobas[1], M.D. Johannes[1] and B.T. Jonker[1] *1. Naval Research Laboratory, Washington, DC, United States*

COD-03. **Magnetic memory driven by topological insulators.** *H. Wu*[1], A. Chen[2], X. Zhang[1], H.N. Pham[3], X. Zhang[2] and K. Wang[4] *1. Songshan Lake Materials Laboratory, Dongguan, China; 2. King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 3. Tokyo Institute of Technology, Tokyo, Japan; 4. University of California, Los Angeles, Los Angeles, CA, United States*

COD-04. **BiSb topological insulator/MnGa ferromagnet systems for spin-to-charge interconversion.** *D. She*[1], N. Figueiredo-Prestes[1], L. Baringthon[1], L. Largeau[2], M. Morassi[2], H. Jaffrès[1], P. Lefvre[3], N. Reyren[1], A. Lemaitre[2] and J. George[1] *1. CNRS/Thales, Palaiseau, France; 2. C2N, Palaiseau, France; 3. Synchrotron SOLEIL, Saint-Aubin, France*

COD-05. **Large and isotropic spin-orbit torques and spin Hall magnetoresistance from the twin-free topological insulator $Bi_{0.9}Sb_{0.1}$.** F. Binda[1], S. Fedel[1], S.F. Alvarado[1], *P. Noël*[1] and P. Gambardella[1] *1. Department of Materials, ETH Zurich, Zürich, Switzerland*

COD-06. **Intrinsic Magnetic Topological Insulators: Discovery and Current Status.** ***(Invited)*** *M.M. Otrokov*[1,2] *1. Centro de Física de Materiales (CFM-MPC), Centro Mixto CSIC-UPV/EHU, Donostia-San Sebastián, Spain; 2. Ikerbasque, Basque Foundation for Science, Bilbao, Spain*

COD-07. **Large spin conversion in the Fe/graphene/Pt interface.** *A. Anadón*[1], I. Arnay[2], R. Guerrero[3], A. Gudín[2], S. Petit-Watelot[1], J. Camarero[2,4], P. Perna[2] and J. Rojas-Sanchez[1] *1. Institut Jean Lamour, Nancy, France; 2. IMDEA Nanociencia, Madrid, Spain; 3. Universidad de Castilla la Mancha, Toledo, Spain; 4. Universidad Autónoma de Madrid, Madrid, Spain*

COD-08. **Helicity-Dependent Terahertz Emission from a Weyl Semimetal Mn3Sn.** *D.F. Hamara*[1], G. Lange[1], A. Markou[2], R. Slager[1] and C. Ciccarelli[1] *1. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 2. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany*

COD-09. **Spintronic THz emission in 2D-$PtSe_2$.** *K. Abdukayumov*[1], C. Vergnaud[1], A. Marty[1], F. Bonell[1], I.G. de Moraes[1], M. Chshiev[1], F. Ibrahim[1], H. Okuno[2], D. Dosenovic[2], A. Ouerghi[3], M. Micica[4], S. Dhillon[4], J. George[5], H. Jaffrès[5] and M. Jamet[1] *1. CEA-SPINTEC, Grenoble, France; 2. IRIG-MEM, Grenoble, France; 3. C2N, Université Paris Saclay, Paris, France; 4. Ecole Normale Superieure Paris, Paris, France; 5. Unité Mixte de Physique, CNRS, Thales, Palaiseau, France*

COD-10. **Antiferromagnetic Dirac nodal line/point and topological insulator states tuned by magnetization orientation in monolayer MnB.** *L. Huang*[1] and L. Wang[1,2] *1. Tianjin Key Labratory of Low Dimensional Materials Physics and Preparation Technology, Tianjin University, Tianjin, China; 2. Tianjin Demonstration Center for Experimental Physics Education,School of Science, Tianjin University, Tianjin, China*

Session COE
SPINS IN VAN DER WAALS MATERIALS

Maciej Dabrowski, Chair
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COE-01. **Gate-tunable anomalous Hall effect in a 3D topological insulator/2D magnet van der Waals heterostructure.** ***(Invited)*** *R. Jain*[1], V. Gupta[1], Y. Ren[3], X.S. Zhang[1], H.F. Alnaser[2], A. Vashist[2], V.V. Deshpande[2], D. Xiao[3], T.D. Sparks[2] and D.C. Ralph[1] *1. Cornell University, Ithaca, NY, United States; 2. University of Utah, Salt Lake, UT, United States; 3. University of Washington, Seattle, WA, United States*

COE-02. **Unconventional spin-to-charge interconversion in low-symmetry van der Waals materials.** *S. Chenattukuzhiyil*[5,1], N. Ontoso[1], J. Ingla-Aynes[1], F. Herling[1], V. Pham[1], I. Groen[1], H. Yang[1], Z. Chi[1], I. Robredo[2], M. Vergniory[2,4], F. de Juan[2,4], A. Chuvilin[1,4], M. Gobbi[1], R. Calvo[3,1], L. Hueso[1,4] and F. Casanova[1,4] *1. CIC nanoGUNE, San Sebastian, Spain; 2. Donostia International Physics Center (DIPC), San Sebastian, Spain; 3. Universidad de Alicante, Alicante, Spain; 4. Ikerbasque, Basque Foundation for Science, Basque Country, Spain; 5. University of Oxford, Oxford, United Kingdom*

COE-03. **Switchable unconventional charge-spin interconversion in van der Waals heterostructures.** *Z. Chi*[1], S. Lee[2], H. Yang[1], N. Ontoso[1], E. Dolan[1], C. Safeer[1], J. Ingla-Aynes[1], F. Herling[1], B. Martin-Garcia[1,3], M. Gobbi[1,3], T. Low[2,4], L. Hueso[1,3] and F. Casanova[1,3] *1. CIC nanoGUNE BRTA, Donostia-San Sebastian, Spain; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 3. Ikerbasque, Basque Foundation for Science, Bilbao, Spain; 4. Department of Physics, University of Minnesota, Minneapolis, MN, United States*

COE-04. **Efficient spin-orbit torque generation in van der Waals heterostructures.** *T. Guillet*[1], R. Galceran[2], J. Sierra[1], M. Jamet[3], F. Bonell[3] and S.O. Valenzuela[1] *1. Catalan Institute of Nanoscience and Nanotechnology, Barcelona, Spain; 2. University of Barcelona, Barcelona, Spain; 3. CEA-SPINTEC, Grenoble, France*

COE-05. **Thickness-dependent SOT effective fields and magnetization control in Topological insulator/2D-ferromagnet $Bi_2Te_3/Cr_{1+\delta}Te_2$ Van der Waals heterostructures with PMA.** *N. Figueiredo-Prestes*[1], A. Lintzeris[2,3], P. Tsipas[2], N. Reyren[1], H. Jaffrès[1], A. Dimoulas[2] and J. George[1] *1. Unité Mixte de Physique CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 2. National Center for Scientific Research Demokritos, Athens, Greece; 3. Physics Department, National Kapodistrian University of Athens, Athens, Greece*

COE-06. **Microscopic magnetic properties of two-dimensional magnetic Fe_xGeTe_2 films on graphene.** ***(Invited)***
A.I. Figueroa[2,1], H. Lv[3], J. Herfort[3], D. Czubak[3], E. Zallo[3,4], C. Guillemard[5], M. Valvidares[5], J. Rubio-Zuazo[6,7], J. López-Sánchez[6,7], S.O. Valenzuela[2,8], M. Hanke[3], M. Ramsteiner[3] and J. J. Lopes[3] *1. Condensed Matter Physics, University of Barcelona, Barcelona, Spain; 2. Catalan Institute of Nanoscience and Nanotechnology, Bellaterra, Spain; 3. Paul-Drude-Institute, Berlin, Germany; 4. Physik Department, Walter Schottky Institut, Technische Universität München, Garching, Germany; 5. ALBA Synchrotron Light Source, Barcelona, Spain; 6. Spanish CRG BM25-SpLine, ESRF—The European Synchrotron, Grenoble, France; 7. Instituto de Ciencia de Materiales de Madrid (ICMM), CSIC, Madrid, Spain; 8. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain*

COE-07. **Enhancement of spin-flop induced magnetic hysteresis in van der Waals magnet $(Fe_{1-x}Co_x)_5GeTe_2$.**
T. Ohta[1], K. Kurokawa[1], N. Jiang[1,2], K. Yamagami[3], Y. Okada[3] and Y. Niimi[1,2] *1. Department of Physics, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 3. Okinawa Instituteof Science and Technology, Onna-son, Japan*

COE-08. **Magnetism of epitaxial $(Fe,Co)_5GeTe_2$ van der Waals magnets in the monolayer limit.**
J. Courtin[1], R. Sant[2], P. Vasconcelos[2], F. Choueikani[3], F. Ibrahim[1], A. Marty[1], D. Dosenovic[4], H. Okuno[4], V. Polewczyk[1], I.G. de Moraes[1], C. Vergnaud[1], D. Jalabert[4], M. Chshiev[1], M. Jamet[1] and *F. Bonell*[1] *1. SPINTEC, Grenoble, France; 2. ESRF, Grenoble, France; 3. SOLEIL Synchrotron, Gif-sur-Yvette, France; 4. CEA-IRIG-MEM, Grenoble, France*

COE-09. **Torques and Topological Spin Structures in Conducting 2D Materials.**
M. Schmitt[1], F. Martin[1], K. Lee[1,2], A. Liedtke[1], A. Shahee[1], A. Puthirath Balan[1], H. Simensen[3], T. Scholz[4], T. Saunderson[1], R. Borkowski[7], D. Go[5], M. Gradhand[1,6], Y. Mokrousov[1,5], T. Denneulin[7], A. Kovács[7], P. Rüßmann[5,8], A. Tavabi[7], P. Mavropoulos[9], B. Lotsch[4], S. Blügel[5], A. Brataas[3] and *M. Kläui*[1,3] *1. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 2. Division of Display and Semiconductor Physics, Korea University, Sejong, The Democratic People's Republic of Korea; 3. Centre for Quantum Spintronics, Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway; 4. Max Planck Institute for solid state research, Stuttgart, Germany; 5. Peter Grünberg Institute and Institute for Advanced Simulation, Forschungszentrum Julich, Julich, Germany; 6. H. H. Wills Physics Laboratory, University of Bristol, Bristol, United Kingdom; 7. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Julich, Julich, Germany; 8. Institute of Theoretical Physics and Astrophysics, University of Würzburg, Würzburg, Germany; 9. Department of Physics, National and Kapodistrian University of Athens, Athens, Greece*

COE-10. **Seeding and Emergence of Composite Skyrmions in van der Waals Magnet Fe_3GeTe_2.** L. Powalla[1], *M. Birch*[2], K. Litzius[2], S. Wintz[2], F.S. Yasin[3], L. Turnbull[4], F. Schulz[2], D. Mayoh[5], G. Balakrishnan[5], M. Weigand[6], X. Yu[3], K. Kern[1,7], G. Schütz[2] and M. Burghard[1] *1. Nanoscale Science, Max Planck Institute for Solid State Research, Stuttgart, Germany; 2. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 3. RIKEN Center For Emergent Matter Science, Wako, Japan; 4. Durham University, Durham, United Kingdom; 5. University of Warwick, Coventry, United Kingdom; 6. Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany; 7. Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*

POSTER SESSION

Session CPA
SKYRMION MATERIALS AND DEVICES (Poster Session)

Anjan Soumyanarayanan, Chair
A*STAR Institute of Materials Research and Engineering, Singapore, Singapore

CPA-01. **Skyrmion diffusion and its voltage gating.** *S. Miki*[1,2], K. Hashimoto[1,2], R. Ishikawa[3], M. Goto[1,2], Y. Shiota[4,5], E. Tamura[1,2], H. Nomura[1,2] and Y. Suzuki[1,2] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. OTRI-Osaka, Osaka University, Suita, Japan; 3. ULVAC, Inc., Suita, Japan; 4. Institute for Chemical Research, Kyoto University, Uji, Japan; 5. CSRN-Kyoto, Kyoto University, Uji, Japan*

CPA-02. **Topology-Dependent Brownian Gyromotion of a Single Skyrmion.** *L. Zhao*[1,3], Z. Wang[1,3], X. Zhang[2], X. Liang[2], Y. Zhou[2] and W. Jiang[1,3] *1. Department of Physics, Tsinghua University, Beijing, China; 2. The Chinese University of Hong Kong (shenzhen), Shenzhen, China; 3. Frontier Science Center for Quantum Information, Tsinghua University, Beijing, China*

CPA-03. **Current-induced skyrmion dynamics in 2-dimensional van der Waals ferromagnet at room temperature.** *Y. Ji*[1], S. Yang[2], H. Ahn[3], T. Ju[2], M. Im[4], H. Han[4], C. Lee[3], C. Hwang[2] and K. Kim[1] *1. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Quantum Spin Team, Korea Reserach Institute of Standards and Science, Daejeon, The Republic of Korea; 3. School of Mechanical Engineering, Sungkyunkwan University, Suwon, The Republic of Korea; 4. Center for X-ray Optics, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

CPA-04. **Realization of zero-field skyrmions in a magnetic tunnel junction.** *B. He*[1,2], Y. Hu[3], J. Zhang[3], Y. Peng[3], X. Han[1,2] and G. Yu[1,2] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, University of Chinese Academy of Sciences, Chinese Academy of Sciences, Beijing, China; 2. Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, Beijing, China; 3. Key Laboratory for Magnetism and Magnetic Materials of Ministry of Education, Lanzhou University, Lanzhou, China*

CPA-05. **Precise Transport of Skyrmions by Surface Acoustic Waves.** *J. Shuai*[1], L. Lopez-Diaz[2], J.E. Cunningham[3] and T.A. Moore[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Department of Applied Physics, Universidad de Salamanca, Salamanca, Spain; 3. School of Electronic and Electrical Engineering, University of Leeds, Leeds, United Kingdom*

CPA-06. **Obtaining skyrmion lattices in epitaxial $[Pd/Co/CoO]_n$ multilayers.** *V. Shatilov*[1], A. Ognev[1], A. Samardak[1] and A. Kozlov[1] *1. Laboratory of Spin-Orbitronics, Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation*

CPA-07. **Manipulating density of magnetic skyrmions via multilayer repetition and thermal annealing.** X. Wang[1], A. Cao[1], S. Li[1], J. Tang[2], *A. Du*[1], H. Cheng[1], Y. Sun[1], H. Du[2], X. Zhang[1] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. High Magnetic Field Laboratory of Chinese Academy of Sciences, Hefei, China*

CPA-08. **Logic operations of magnetic-skyrmion chirality via a branched nanowire.** Y. Nakatani[1], *K. Yamada*[2] and A. Hirohata[3] *1. Graduate School of Informatics and Engineering, University of Electro-Communications, Chofu, Japan; 2. Faculty of Engineering, Gifu University, Gifu, Japan; 3. Department of Electronic Engineering, University of York, York, United Kingdom*

CPA-09. **Withdrawn**

CPA-10. **Generation and annihilation of skyrmions and antiskyrmions in magnetic heterostructures.** *S. Koraltan*[1], F. Bruckner[1], C. Abert[1] and D. Suess[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria*

CPA-11. **Mechanisms and Control of Inter-Skyrmion Attractions.** *M. Kameda*[1,2], K. Kobayashi[3] and Y. Kawaguchi[2] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Department of Applied Physics, Nagoya University, Nagoya, Japan; 3. Department of Physics, Kyushu University, Fukuoka, Japan*

CPA-12. **Numerical study on skyrmion transport with small size and high speed.** *R. Satone*[1], Y. Kurokawa[1] and H. Yuasa[1] *1. Information Science and Electrical Engineering, Kyushu University, Motooka Nishi-ku, Japan*

CPA-13. **Thermal Skyrmion Dynamics in Thin Films Revealed by Kerr Microscopy.** *R. Gruber*[1], M.A. Brems[1], J. Rothörl[1], T. Sparmann[1], J. Zázvorka[2], M. Schmitt[1], I. Kononenko[1,3], F. Kammerbauer[1], M. Syskaki[1,4], D. Rodrigues[5], P. Virnau[1] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 2. Faculty of Mathematics and Physics, Charles University in Prague, Prague, Czechia; 3. Institute of Applied Physics, National Academy of Sciences of Ukraine, Sumy, Ukraine; 4. Singulus Technologies AG, Kahl am Main, Germany; 5. Dipartimento di Ingegneria Elettrica e dell'Informazione, Politecnico di Bari, Bari, Italy*

CPA-14. **Towards Coding Information by 3D Chiral Spin Textures.** *H.J. Hug*[1], A. Mandru[1], O. Yildirim[1], T. Dutta[1], Y. Feng[1], R. Peremadathil-Pradeep[1], R. Tomasello[2], G. Carlotti[3], S. Tacchi[4], D. Suess[5], A. Giordano[6] and G. Finocchio[6] *1. Magnetic and Functional Thin Films, Empa, Duebendorf, Switzerland; 2. Politecnico di Bari, Bari, Italy; 3. University of Perugia, Perugia, Italy; 4. IOM - Istituto Officina dei Materiali, Perugia, Italy; 5. University of Vienna, Vienna, Austria; 6. University of Messina, Messina, Italy*

CPA-15. **Voltage-Controlled Skyrmionic Interconnect with Multiple Magnetic Information Carriers.** R. Chen[1], *W. Griggs*[1], Y. Li[1], V. Pavlidis[1] and C. Moutafis[1] *1. Department of Computer Science, University of Manchester, Manchester, United Kingdom*

CPA-16. **XMCD study on skyrmion-host chiral ferromagnetic $Fe_{2-x}Pd_xMo_3N$ thin films.** *B. Qiang*[1,2], T. Fukasawa[1], T. Hajiri[1], H. Asano[1,3] and T. Ito[4] *1. Department of Materials Physics, Nagoya University, Nagoya, Japan; 2. Department of Material s Design Engineering, Nagoya University, Nagoya, Japan; 3. Research Department, Nagoya Industrial Science Research Institute, Nagoya, Japan; 4. Synchrotron Radiation Research Center, Nagoya University, Nagoya, Japan*

CPA-17. **Gate-controlled skyrmion-based majority logic in a nanomagnetic device.** B. Paikaray[1], M. Kuchibhotla[2], A. Haldar[2] and *C. Murapaka*[1] *1. Department of Materials Science and Metallurgical Engineering, Indian Institute of Technology Hyderabad, Sangareddy, India; 2. Physics, Indian Institute of Technology Hyderabad, Sangareddy, India*

CPA-18. **Withdrawn**

CPA-19. **The correlation between skyrmion size, shape and device geometry.** *W.Z. Al Saidi*[1] *1. Physics, Sultan Qaboos University, Muscat, Oman*

CPA-20. **Overlapping-skyrmions based racetrack memory.** *T. Nishitani*[1], S. Honda[1] and H. Itoh[1] *1. Department of Pure and Applied Physics, Kansai University, Suita, Japan*

POSTER SESSION

Session CPB
SPINS IN 2D AND TOPOLOGY MATERIALS (Poster Session)

Amir Capua, Co-Chair
The Hebrew University of Jerusalem, Jerusalem, Israel
Kyusup Lee, Co-Chair
Pukyong National University, Busan, Korea (Republic of)

CPB-01. **Ferromagnetism in two-dimensional $PtSe_2$.** H. Xu[1], H. Wu[1], *M. Wang*[2] and C. Chang[2] *1. School of Physics, Beijing Institute of Technology, Beijing, China; 2. Department of Physics, National Taiwan University, Taipei, Taiwan*

CPB-02. **Second-order spin and charge responses in LaO/STO heterostructure.** *Z. Siu*[1], A. Kundu[1,2] and M.B. Jalil[1] *1. National University of Singapore, Singapore; 2. Ariel University, Ariel, Israel*

CPB-03. **Breaking through the Mermin-Wagner limit in 2D van der Waals magnets.** S. Jenkins[1,2], L. Rózsa[3], U. Atxitia[4], *R.F. Evans*[1], K.S. Novoselov[5] and E. Santos[6] *1. Physics, University of York, York, United Kingdom; 2. Physics, Johannes Gutenberg University, Mainz, Germany; 3. Physics, University of Konstanz, Konstanz, Germany; 4. Physics, Freie Universität Berlin, Berlin, Germany; 5. Physics, National University of Singapore, Singapore; 6. Physics, University of Edinburgh, Edinburgh, United Kingdom*

CPB-04. **Growth and terahertz conductivity of epitaxial Mn_3Sn thin films.** *D. Gao*[1], T. Zhang[1], T. Yin[1], F. Tang[1], Z. Bin[1], Y. Yang[1], W. Yang[1], J. Qin[1], S. Liu[1], L. Deng[1], M. Hu[1] and L. Bi[1] *1. University of Electronic Science and Technology of China, Chengdu, China*

CPB-05. **Gate-Controlled Charge Rectification in Elemental Tellurium.** *D. Hirobe*[1], Y. Nabei[2,3] and H. Yamamoto[2,3] *1. Shizuoka University, Shizuoka, Japan; 2. Institute for Molecular Science, Okazaki, Japan; 3. The Graduate University for Advanced Studies, Okazaki, Japan*

CPB-06. **Two-Step Synthesis of Spin-Helix Layered Material SnS by Physical Vapor Deposition and Nitrogen Etching.** *K. Koyama*[1], M. Aoyama[1], T. Odagawa[1], T. Miyazaki[1], C. Zhang[2], S. Karube[1] and M. Kohda[1,3] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 3. Quantum Materials and Applications Research Center, National Institutes for Quantum Science and Technology, Takasaki, Japan*

CPB-07. **Tunneling magnetoresistance effects based on van der Waals room-temperature ferromagnet Fe_3GaTe_2.** *M. Zhu*[1], X. Li[1], Y. Wang[1], F. Zheng[1], J. Dong[1], Y. Zhou[1], L. You[1] and J. Zhang[1] *1. Huazhong University of Science & Technology, Wuhan, China*

CPB-08. **Two-dimensional GdI_2/GeC van der Waals heterostructure: Bipolar magnetic semiconductor with high Curie temperature and large magnetic anisotropy energy.** *X. Fan*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

CPB-09. **Unconventional Emergent Hall Effect Phenomena and its Modification in a van der Waals Ferromagnet Fe_3GeTe_2.** R. Roy Chowdhury[1], C. Patra[1], S. Duttagupta[2,3], S. Fukami[3,4] and R. Singh[1] *1. Physics, Indian Institute of Science Education and Research Bhopal, Bhopal, India; 2. Saha Institute of Nuclear Physics, KOLKATA, India; 3. Center for Science and Innovation in Spintronics (CSIS), Tohoku University, 980-8577, Japan, Sendai, Japan; 4. Research Institute of Electrical Communication (RIEC), Tohoku University, SENDAI, Japan*

CPB-10. **Dzyaloshinskii–Moriya Interaction in WS_2/Py Bilayers.** *C. Wu*[1], Y. Lin[2], L. Tsai[1], R. Jain[1], J. Liang[3], Y. Lee[2] and S. Lee[1] *1. Institute of Physics, Academia Sinica, Taipei, Taiwan; 2. Materials, National Tsing Hua University, Hsinchu, Taiwan; 3. Physics, Fu Jen Catholic University, New Taipei, Taiwan*

CPB-11. **The Enhancement of Perpendicular Magnetic Anisotropy of Pt/Co/Pt by inserting a few-layer MoS2.** *C. Li*[1], X. Xu[1], Z. Zhu[1], C. Dou[1], M. Li[1], K. Meng[1], Y. Wu[1], J. Chen[1] and Y. Jiang[2] *1. University of Science and Technology Beijing, Beijing, China; 2. Tiangong University, Tianjin, China*

CPB-12. **Influence of magnetic moments on spin-orbit torque efficiency from topological surface state in TI/FM interface.** *H. Poh*[1] and W. Lew[1] *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

CPB-13. **Spin-charge interconversion in Topological Insulator Sb_2Te_3.** S. Teresi[1], *T. Frottier*[1], M. Cosset-Cheneau[1], A. Kandazoglou[1], P. Sgarro[1], C. Grezes[1], N. Sebe[1], P. Noé[2], J. Patterson[2], F. Hippert[3], L. Hutin[2], G. Prenat[1], A. Marty[1], J. Attané[1] and L. Vila[1] *1. Université Grenoble Alpes / CEA / IRIG / SPINTEC, Grenoble, France; 2. Université Grenoble Alpes / CEA / LETI, Grenoble, France; 3. Université Grenoble Alpes / CNRS / Grenoble INP / LMGP, Grenoble, France*

CPB-14. **Effect of cracker cell temperature on MBE-grown Sb_2Te_3 topological insulator thin film.** *A. Yagmur*[1], C.S. Knox[1], J. Burton[1], B.J. Hickey[1] and S. Sasaki[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

ORAL SESSIONS

Session DOA
SPIN CURRENTS, SPIN PUMPING, SPIN HALL, AND RELATED EFFECTS I

Guoqiang Yu, Chair
Chinese Academy of Sciences, Beijing, China

DOA-01. **Control of spin currents and antiferromagnetic moments via topological surface states for ultralow energy consumption.** ***(Invited)*** X. Chen[1], H. Bai[1], Y. Ji[2], X. Kou[2], F. Pan[1] and *C. Song*[1] *1. Tsinghua University, Beijing, China; 2. ShanghaiTech University, Shanghai, China*

DOA-02. **Power and Phase Profiles in Nano-constriction Based Synchronized Spin Hall Nano-oscillators near Threshold Current.** W. Ronayne[1,2], *A. Samanta*[1,2], A. Amann[3,4] and S. Roy[1,2] *1. Micropower Devices and Nanomagnetics Group, Tyndall National Institute, Cork, Ireland; 2. Department of Physics, University College Cork, Cork, Ireland; 3. School of Mathematical Sciences, University College Cork, Cork, Ireland; 4. Photonics Centre, Tyndall National Institute, Cork, Ireland*

DOA-03. **Effect of magnetic ordering on the spin Hall angle of epitaxial Ho(0001) thin films.** *B. Sahoo*[1,2], Y. Xiao[2] and E. Fullerton[2] *1. Physics, University of California, San Diego, La Jolla, CA, United States; 2. Center for Memory and Recording Research, University of California, San Diego, La Jolla, CA, United States*

DOA-04. **Anatomy of Type-*x* Spin-Orbit Torque Switching: Insights from Simulations and Experiments.** *Y. Liu*[1], C. Huang[1], Y. Huang[1], K. Chen[1], C. Tsai[1], Y. Li[1], T. Chang[1], C. Cheng[1] and C. Pai[1,2] *1. Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; 2. Center of Atomic Initiative for New Materials, National Taiwan University, Taipei, Taiwan*

DOA-05. **Direct Electrical Probing of Anomalous Nernst Conductivity.** *W. Zhou*[1], A. Miura[2], Y. Sakuraba[2] and K. Uchida[2,3] *1. International Center for Young Scientists, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Institute for Materials Research, Tohoku University, Sendai, Japan*

DOA-06. **Spin-fluctuation induced enhancement for pure spin current.** *P. Wu*[1,2], D. Qu[3,4], Y. Tu[1,2], H. Liang[1], Y. Lin[1], S. Lee[5], C. Chien[6] and S. Huang[1,4] *1. Physics Department, National Taiwan University, Taipei, Taiwan; 2. Delta Electronics, Inc., Jhongli, Taiwan; 3. Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; 4. Center of Atomic Initiative for New Materials, National Taiwan University, Taipei, Taiwan; 5. Institute of Physics, Academia Sinica, Taipei, Taiwan; 6. Physics and Astronomy, Johns Hopkins University, Baltimore, MD, United States*

DOA-07. **State tomography for magnetization dynamics and persistent coherence in $Y_3Fe_5O_{12}$.** *T. Hioki*[1,2], T. Makiuchi[2], H. Shimizu[2], K. Hoshi[2], M. Elyasi[1], K. Yamamoto[3], N. Yokoi[2], G. Bauer[1] and E. Saitoh[2,1] *1. AIMR, Tohoku University, Sendai, Japan; 2. Applied Physics, The University of Tokyo, Bunkyo, Japan; 3. Japan Atomic Energy Agency, Tokai, Japan*

DOA-08. **Significant effect of carrier concentration on spin lifetime at low temperatures in strained $Si_{0.1}Ge_{0.9}$.** *K. Kawashima*[1], T. Naito[1,2], M. Yamada[2,3], T. Okada[1], Y. Wagatsuma[4], K. Sawano[4] and K. Hamaya[2,5] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 3. PRESTO, Japan Science and Technology Agency, Kawaguchi, Japan; 4. Advanced Research Laboratories, Tokyo City University, Setagaya, Japan; 5. Spintronics Research Network Division, Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Toyonaka, Japan*

DOA-09. **Nonreciprocal Parametric Magnon Excitation by Surface Mode.** *S. Horibe*[1], H. Shimizu[1], K. Hoshi[1], T. Hioki[2,1] and E. Saitoh[1,2] *1. Applied Physics, The University of Tokyo, Tokyo, Japan; 2. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan*

DOA-10. **Ultra-low-current spin Hall nano-oscillators.** *N. Behera*[1], A. Chaurasiya[1], V. Gonzalez[1], L. Bainsla[1], A. Kumar[1], A. Awad[1], H. Fulara[2] and J. Åkerman[1] *1. Physics, University of Gothenburg, Gothenburg, Sweden; 2. Physics, Indian Institute of Technology Roorkee, Roorkee, India*

DOA-11. **Spin voltage gradient is the driving force for ultrafast demagnetization and terahertz spin transport.** *M. Rouzegar*[1,2], L. Brandt[3], L. Nadvornik[4], D. Reiss[1], A. Chekhov[1,2], O. Gueckstock[1,2], C. In[1], M. Wolf[2], T. Seifert[1], P. Brouwer[1], G. Woltersdorf[3] and T. Kampfrath[1,2] *1. Experimental Physiks, Free University of Berlin, Berlin, Germany; 2. Physical Chemistry, Fritz-Haber-Institute of Max-Planck Society, Berlin, Germany; 3. Institut für Physik, Martin-Luther-Universität Halle, Halle, Germany; 4. Mathematics and Physics, Charles University in Prague, Prague, Czechia*

Session DOB
SPIN CURRENTS, SPIN PUMPING, SPIN HALL, AND RELATED EFFECTS II

Jiahao Han, Chair
Tohoku University, Tokyo, Japan

DOB-01. **Observation of a Strong Magnetic-Field-Induced Spin Seebeck Effect Suppression in a Nearly Compensated Ferrimagnet.** *R. Ramos*[2,4], T. Hioki[1,3], T. Kikkawa[4,1], Y. Hashimoto[4] and E. Saitoh[1,4] *1. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 2. CIQUS, Universidad de Santiago de Compostela, Santiago de Compostela, Spain; 3. Institute for Materials Research, Tohoku University, Sendai, Japan; 4. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan*

DOB-02. **Topologically Influenced Spintronic Terahertz Emission in Co_2MnGa Weyl Semimetal.** *R. Mandal*[1], R. Momma[1], K. Ishibashi[1], S. Iihama[1], K. Suzuki[1] and S. Mizukami[1] *1. Tohoku University, Sendai, Japan*

DOB-03. **Picosecond optospintronic tunnel junctions.** ***(Invited)*** *W. Zhao*[1] *1. Fert Beijing Institute, MIIT Key Laboratory of Spintronics, School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China*

DOB-04. **Scalable Spin-to-Charge Conversion Effect in the Inverse Spin Hall Nanodevice.** Y. Lin[1], T. Hsin[1], Y. Wu[1], J. Sun[2] and *Y. Tseng*[1] *1. Materials Science & Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 2. Industry Academia Innovation School, National Yang Ming Chiao Tung University, Hsinchu, Taiwan*

DOB-05. **Observation of Spin-resolved Band Structure in Fe_3Ga Thin-films.** K. Ohwada[1], K. Nakanishi[1], K. Kuroda[1], K. Miyamoto[1], T. Okuda[1], W. Zhou[2], T. Sasaki[2], K. Masuda[2], S. Isogami[2], Y. Sakuraba[2] and *A. Kimura*[1] *1. Hiroshima University, Higashi-hiroshima, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

DOB-06. **Magnonic Unidirectional Spin Hall Magnetoresistance and Spin Seebeck Effect in Ferrimagnetic Alloys with Spin-Flop Transition.** *S. Ding*[1], W. Legrand[1], P. Noël[1], R. Schlitz[1], G. Krishnaswamy[1], G. Sala[1] and P. Gambardella[1] *1. ETH Zurich, Zurich, Switzerland*

DOB-07. **Nonlocal detection of interlayer three-magnon coupling.** *L. Sheng*[1], M. Elyasi[2], J. Chen[3], G. Bauer[2] and H. Yu[1] *1. Beihang University, Beijing, China; 2. Tohoku University, Sendai, Japan; 3. Southern University of Science and Technology, Shenzhen, China*

DOB-08. **High Spin-Charge Conversion Efficiency of $Co_3Sn_2S_2$ Promoted by Transition from Paramagnetic to Ferromagnetic Phase.** *T. Seki*[1], Y. Lau[1,2], J. Ikeda[1,4], K. Fujiwara[1], A. Ozawa[1], S. Iihama[3,4], K. Nomura[1,5] and A. Tsukazaki[1,6] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 3. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 4. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 5. Department of Physics, Kyushu University, Fukuoka, Japan; 6. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

DOB-09. **Origin of Field-Free Switching in Obliquely Deposited Pt/Co/Pt Structures.** *C. Hu*[1], W. Chen[1], Y. Liu[1], C. Huang[1] and C. Pai[1,2] *1. Materials Science and Engineering, National Taiwan University, Taipei, Taiwan; 2. Taiwan Semiconductor Manufacturing Company, Taipei, Taiwan*

DOB-10. **Amplification of electron-mediated spin currents by stimulated spin pumping.** *B.J. Assouline*[1], M. Brik[1], N. Bernstein[1] and A. Capua[1] *1. Applied Physics, The Hebrew University of Jerusalem, Jerusalem, Israel*

DOB-11. **Spin to charge conversion in ferroelectric Germanium Telluride (GeTe) for a new generation of logic devices.** S. Teresi[1], *T. Frottier*[1], M. Cosset-Cheneau[1], A. Kandazoglou[1], P. Sgarro[1], M. Wissmann[1], M. Culot[1], P. Noé[2], J. Patterson[1], F. Hippert[5], L. Hutin[2], F. Cheynis[3], F. Leroy[3], B. Cores[3], M. Bibes[4], G. Prenat[1], A. Marty[1], J. Attané[1] and L. Vila[1] *1. Université Grenoble Alpes / CEA / IRIG / SPINTEC, Grenoble, France; 2. Université Grenoble Alpes / CEA / LETI, Grenoble, France; 3. Aix Marseille Université / CNRS / CINAM / AMUTECH, Marseille, France; 4. Unité Mixte de Physique CNRS/Thalès, Université Paris-Saclay, Palaiseau, France; 5. Université Grenoble Alpes / CNRS / Grenoble INP / LMGP, Grenoble, France*

Session DOC
SPIN CURRENTS, SPIN PUMPING, SPIN HALL, AND RELATED EFFECTS III

Christoforos Moutafis, Chair
University of Manchester, Manchester, United Kingdom

DOC-01. **Efficient spin to charge current conversion in WSe2 by spin pumping from CoFeB.** *E.O. Burgos Parra*[1], K. Abdukayumov[2], G. Rodriguez[1], C. Vergnaud[2], H. Boukari[2], A. Marty[2], F. Bonell[2], I.G. de Moraes[2], R. Rodriguez[3], S. Oyarzún[1] and M. Jamet[2] *1. Physics Department, Universidad de Santiago de Chile, Santiago, Chile; 2. CEA-SPINTEC, Grenoble, France; 3. Physics Department, Pontificia Universidad Católica de Chile, Santiago, Chile*

DOC-02. **Single layer spin-orbit torque in $Mn_2Ru_{0.9}Ga$.** *S. Lenne*[1], G. Atcheson[1], R. Smith[1], P.S. Stamenov[1] and K. Rode[1] *1. Trinity College Dublin, Dublin, Ireland*

DOC-03. **Gate-Tunable and Chirality-Dependent Unidirectional Magnetoresistance in Tellurium Nanowires.** *F. Calavalle*[1,2], M. Suárez-Rodríguez[1], B. Martin-Garcia[1,3], A. Johansson[4,5], D. Vaz[1], H. Yang[1], I.V. Maznichenko[4], S. Ostanin[5], A. Mateo-Alonso[6,3], A. Chuvilin[1,3], I. Mertig[4], M. Gobbi[1,3], F. Casanova[1,3] and L. Hueso[1,3] *1. CIC nanoGUNE BRTA, Donostia - San Sebastian, Spain; 2. Department of Electronic Science and Engineering, Kyoto University, Kyoto, Japan; 3. Ikerbasque, Bilbao, Spain; 4. Institute of Physics, Martin-Luther-University Halle-Wittenberg, Halle, Germany; 5. Max Planck Institute of Microstructure Physics, Halle, Germany; 6. POLYMAT, Donostia - San Sebastian, Spain*

DOC-04. **Effect of layer thickness to the in-plane coercive field and anomalous Nernst effect in Sm/Co multilayer films.** *R. Modak*[1], W. Zhou[1], Y. Sakuraba[1] and K. Uchida[1,2] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Institute for Materials Research,Tohoku University, Sendai, Japan*

DOC-05. **Determining the Mechanism of Transverse Spin-Current Absorption in Nanometer-Thick Ferromagnets.** Y. Lim[1], S. Wu[1], D.A. Smith[1], C. Klewe[2], P. Shafer[2] and *S. Emori*[1] *1. Virginia Tech, Blacksburg, VA, United States; 2. Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

DOC-06. **Effects of Elemental Doping and Interface Engineering on Spin-Orbit Torques in CoSi-based Topological Semimetal Thin Films.** *K. Tang*[1,2], Z. Wen[1], T. Seki[3], H. Sukegawa[1] and S. Mitani[1,2] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. University of Tsukuba, Tsukuba, Japan; 3. Tohoku University, Sendai, Japan*

DOC-07. **Nonlinear Hall Effect Driven by Electric Field and Temperature Gradient with Three-Dimensional Magnetic Textures.** *T. Yamaguchi*[2], K. Nakazawa[1] and A. Yamakage[3] *1. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 2. Center for Emergent Matter Science, RIKEN, Wako, Japan; 3. Department of Physics, Nagoya University, Nagoya, Japan*

DOC-08. **Spin-Gapless Semiconducting Properties in a Polycrystalline CoCrFeAl Heusler-Alloy Film.** T. Sarfo[1] and *A. Hirohata*[1] *1. University of York, York, United Kingdom*

DOC-09. **Circular Memristive Nano-Gates on Spin Hall Nano Oscillators.** *M. Khademi*[1,2], A. Kumar[3], M. Rajabali[2], S.P. Dash[1] and J. Åkerman[3] *1. Department of Microtechnology and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden; 2. NanOsc AB, Kista, Sweden; 3. Physics Department, University of Gothenburg, Gothenburg, Sweden*

DOC-10. **Antimagnonics and enhancing the magnon spin current using the bosonic Klein paradox.** *J.S. Harms*[1], H. Yuan[1] and R.A. Duine[1,2] *1. Utrecht University, Utrecht, Netherlands; 2. Eindhoven University of Technology, Eindhoven, Netherlands*

DOC-11. **Nonreciprocal Magnon Hanle Effect in Antiferromagnetic α-Fe_2O_3.** J. Gückelhorn[1,2], S. de-la-Peña[3], M. Scheufele[1,2], M. Grammer[1,2], *M. Opel*[1], S. Geprägs[1], J.C. Cuevas[3], R. Gross[1,2], H. Huebl[1,2], A. Kamra[3] and M. Althammer[1,2] *1. Walther-Meissner-Institut, Bayerische Akademie der Wissenschaften, Garching, Germany; 2. TUM School of Natural Sciences, Technical University of Munich, Garching, Germany; 3. Condensed Matter Physics Center (IFIMAC), Universidad Autónoma de Madrid, Madrid, Spain*

DOC-12. **Thermoelectric Generation in $Y_3Fe_5O_{12}$/Co-Ru/Pt Systems.** *Y. Ikeda*[1], Y. Hamada[1], Y. Kurokawa[1], C. Martin Valderrama[2], B. Andreas[2] and H. Yuasa[1] *1. Kyushu University, Fukuoka, Japan; 2. CIC nanoGUNE, San Sebastin, Spain*

DOC-13. **THz emission from Fe/Pt spintronic emitters with $L1_0$-FePt alloyed interface.** *L. Scheuer*[1], M. Ruhwedel[1], L. Franke[1], D. Sokoluk[1], G. Torosyan[2], G. Vourlias[3], M. Rahm[1], B. Hillebrands[1], T. Kehagias[3], R. Beigang[1] and E. Papaioannou[4,3] *1. Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau, Kaiserslautern, Germany; 2. Photonic Center Kaiserslautern, Kaiserslautern, Germany; 3. Aristotle University of Thessaloniki, Thessaloniki, Greece; 4. Martin-Luther-University Halle-Wittenberg, Halle, Germany*

Session DOD
VOLTAGE-CONTROLLED MAGNETIC ANISOTROPY I

Tom Thomson, Chair
University of Manchester, Manchester, United Kingdom

DOD-01. **Antiferromagnetic Tunnel Junctions for Spintronics.** ***(Invited)*** *E.Y. Tsymbal*[1] *1. Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, United States*

DOD-02. **Orbital Polarization Enhanced by Electron Correlation at the Fe/MgO Interface: A Depth-Resolved X-Ray Magnetic Circular Dichroism Study.** *S. Sakamoto*[1], M. Tsujikawa[2], M. Shirai[2], K. Amemiya[3] and S. Miwa[1,4] *1. The Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 2. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 3. Institute of Materials Structure Science, KEK, Tsukuba, Japan; 4. Trans-scale Quantum Science Institute, The University of Tokyo, Bunkyo, Japan*

DOD-03. **Voltage-controlled magnetic easy-cone states for low-power spintronic applications.** *J. Jeong*[1], M. Kang[1], S. Lee[1], J. Kang[1], K. Lee[1] and B. Park[1] *1. Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea*

DOD-04. **Withdrawn**

DOD-05. **Effect of alkali halide layer insertions on magnetic anisotropy at the Fe/MgO interface.** *J. Chen*[1], S. Sakamoto[1], H. Kosaki[1] and S. Miwa[1,2] *1. The Insititute for Solid State Physics, The University of Tokyo, Chiba, Japan; 2. Trans-scale Quantum Science Institute, The University of Tokyo, Tokyo, Japan*

DOD-06. **Interface control of anisotropy in CoFeB/MgO/HfO_2 using dusting layers and magneto-ionic gating.** T. Bhatnagar-Schöffmann[1], A. Kovács[2], R. Pachat[1], D. Ourdani[3], A. Lamperti[4], M. Syskaki[5], T. da Câmara Santa Clara Gomes[6], Y. Roussigné[3], S. Ono[7], J. Langer[5], R.E. Dunin-Borkowski[2], P. Schöffmann[8], D. Ravelosona[1,9], M. Belmeguenai[3], A. Solignac[10] and *L. Herrera Diez*[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Universite Paris-Saclay, Palaiseau, France; 2. Forschungszentrum Julich GmbH, Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Grunberg Institute (PGI-5), Juelich, Germany; 3. Laboratoire des Sciences des Procedes et des Materiaux, CNRS-UPR 3407, Universite Sorbonne Paris Nord, Villetaneuse, France; 4. CNR-IMM, Agrate Unit, Agrate-Brianza, Italy; 5. Singulus Technologies AG, Kahl am Main, Germany; 6. Unité Mixte de Physique CNRS/Thales, Universite Paris-Saclay, Palaiseau, France; 7. Central Research Institute of Electric Power Industry, Yokosuka, Japan; 8. Synchrotron SOLEIL, Saint Aubin, France; 9. Spin-Ion Technologies, Palaiseau, France; 10. SPEC, CEA, CNRS, Universite Paris-Saclay, Gif-sur-Yvette, France*

Session DOE
VOLTAGE-CONTROLLED MAGNETIC ANISOTROPY II

Ivan Vera Marun, Chair
University of Manchester, Manchester, United Kingdom

DOE-01. **Advances in Magnetic Tunnel Junctions and Voltage-Induced Dynamic Switching for Voltage-Controlled MRAM.** ***(Invited)*** *S. Yuasa*[1], T. Nozaki[1], T. Yamamoto[1], T. Ichinose[1], T. Nozaki[1], H. Onoda[1], A. Sugihara[1], R. Matsumoto[1], H. Imamura[1], H. Nakayama[1], M. Konoto[1] and K. Yakushiji[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

DOE-02. **VCMA-MTJ: Towards GHz operation low power MRAM.** ***(Invited)*** W. Kim[1], R. Carpenter[1], K. Sankaran[1], S. Rao[1], D. Favaro[1], N. Jossart[1], N. Franchina Vergel[1], D. Crotti[1], K. Wostyn[1], G. Kar[1] and *S. Couet*[1] *1. Imec, Leuven, Belgium*

DOE-03. **Magneto-Transport Properties of CoFeB/MgO/CoFeB Magnetic Tunnel Junctions Deposited at Cryogenic Temperature.** *T. Ichinose*[1], T. Yamamoto[1], T. Nozaki[1], K. Yakushiji[1], S. Tamaru[1], M. Konoto[1] and S. Yuasa[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

DOE-04. **Solid-State Lithium-Ion Supercapacitor for Voltage Control of Skyrmions.** *M. Ameziane*[1], J. Huhtasalo[1], L. Flajšman[1], R. Mansell[1] and S. van Dijken[1] *1. Applied Physics, Aalto University, Espoo, Finland*

DOE-05. **Interplay of voltage-controlled magnetic anisotropy and spin-orbit torque in IrMn-based perpendicular magnetic tunnel junctions.** *J. Lu*[2], W. Li[1], J. Liu[2], Z. Liu[2], Y. Wang[2], C. Jiang[2], J. Du[2], S. Lu[1], N. Lei[2], S. Peng[2] and W. Zhao[2] *1. Beihang University, Beijing, China; 2. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China*

DOE-06. **Electric field control of RKKY coupling through solid-state ionics.** *R. Mansell*[1], M. Ameziane[1], R. Rosenkamp[1], L. Flajšman[1] and S. van Dijken[1] *1. Department of Applied Physics, Aalto University, Espoo, Finland*

POSTER SESSION

Session DPA
SPIN CURRENTS, SPIN PUMPING, SPIN HALL, AND RELATED EFFECTS IV (Poster Session)

Tatsuya Yamamoto, Co-Chair
National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
Rajkumar Modak, Co-Chair
National Institute for Materials Science (NIMS), Tsukuba, Japan

DPA-01. **Systematic study of parallel parametric amplification of magnetization dynamics in YIG thin disk.** *G. Emdi*[1], T. Hioki[2,1] and E. Saitoh[1,2] *1. Department of Applied Physics, The University of Tokyo, Bunkyo, Japan; 2. Advanced Institute for Material Research, Tohoku University, Sendai, Japan*

DPA-02. **Atomic Layer Deposition of Perpendicularly Magnetized Co Layers Showing Current-induced Domain Wall Motion.** M. Kado[1], Y. Tokuda[1], Y. Ootera[1], N. Umetsu[1], M. Quinsat[1], H. Fukumizu[1] and *T. Kondo*[1] *1. Kioxia Corporation, Yokohama, Japan*

DPA-03. **Spin-Orbit Torques in PtCr and PtCu multi-layers/Co bi-layers.** *W. Janssens*[1,2], G. Talmelli[2], K. Cai[2], R. Carpenter[2], J. De Boeck[1,2] and S. Couet[2] *1. Department of Electrical Engineering, KU Leuven, Leuven, Belgium; 2. Imec, Leuven, Belgium*

DPA-04. **Spin-orbit torques in Co_2MnGa magnetic Weyl semimetal thin films.** *L. Bainsla*[1,2], Y. Sakuraba[3], A. Awad[2], A. Kumar[2], N. Behera[2], R. Khymyn[2], S.P. Dash[1] and J. Åkerman[2] *1. Department of Microtechnology and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden; 2. Physics Department, University of Gothenburg, Gothenburg, Sweden; 3. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan*

DPA-05. **Anomalous Hall Transport of Ferrimagnetic Inverse Heusler Alloy Mn2PdSn.** *A. Bhattacharya*[1], S. Duttagupta[1] and I. Das[1] *1. Condensed Matter Physics, Saha Institute of Nuclear Physics, Kolkata, India*

DPA-06. **Nano artificial alloys in bulk-immiscible Ru-Cu system for spin-current generation.** *C. He*[1], J. Song[1,2], Z. Wen[1], H. Sukegawa[1], Y. Miura[1], T. Ohkubo[1], Y. Nozaki[3] and S. Mitani[1,2] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan; 3. Department of Physics, Keio University, Yokohama, Japan*

DPA-07. **Quantification of Spin Accumulation in Ferromagnetic Heterostructure using DC Bias Harmonic Hall Measurement.** *H. Poh*[1], C.C. Ang[1], W. Lew[1] and G.J. Lim[1] *1. School Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

DPA-08. **High-Throughput Calculation of Transverse Transport Properties in Heusler Compounds.** *G. Xing*[1], K. Masuda[1], T. Tadano[1] and Y. Miura[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

DPA-09. **Spin Hall effect in Se-implanted Pt from extrinsic scattering.** *G. Vashisht*[1], U. Shashank[1], Y. Kusaba[1], T. Tomoda[1], R. Nongjai[2], P. Murmu[3], J. Kennedy[3], R. Medwal[4], S. Gupta[5], R. Rawat[5], A. Kandasami[6], H. Asada[7] and Y. Fukuma[1] *1. Department of Physics and Information Technology, Faculty of Computer Science and System Engineering, Kyushu Institute of Technology, Iizuka, Japan; 2. Materials Science Division, Inter-University Accelerator Centre, Delhi, India; 3. National Isotope Centre, GNS Science, Lower Hutt, New Zealand; 4. Department of Physics, Indian Institute of Technology, Kanpur, India; 5. Natural Sciences and Science Education, National Institute of Education, Nanyang Technological University, Singapore, Singapore; 6. Department of Physics & Centre for Interdisciplinary Research, University of Petroleum and Energy Studies, Dehradun, India; 7. Graduate School of Sciences and Technology for Innovation, Yamaguchi University, Ube, Japan*

DPA-10. **Thickness dependence of Gilbert damping in Ta/CoFeB/MgO films probed by Tr-MOKE.** *Y. Gong*[1], X. Lu[1], J. Su[2], Z. Chen[1], L. Yang[1], Y. Yan[1], Y. Li[1], X. Ruan[1], J. Du[3], J. Cai[2], J. Wu[4], L. He[1], R. Zhang[1], H. Meng[5], B. Liu[5] and Y. Xu[1,4] *1. School of Electronic Science and Engineering, Nanjing University, Nanjing, China; 2. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 3. Department of Physics, Nanjing University, Nanjing, China; 4. York-Nanjing Joint Center (YNJC) for Spintronics and Nano-engineering, Department of Electronics and Physics, University of York, York, United Kingdom; 5. Devices and Systems of Zhejiang Province, Hangzhou, China*

DPA-11. **Spin current generation in highly conductive Ru/Cu epitaxial heterostructures.** *Z. Wen*[1], J. Song[1,2], C. He[1], T. Scheike[1], H. Sukegawa[1], T. Ohkubo[1], Y. Nozaki[3] and S. Mitani[1,2] *1. National Institute for Materials Science, Tsukuba, Japan; 2. Graduate School of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan; 3. Department of Physics, Keio University, Yokohama, Japan*

DPA-12. **Spin Swapping Effect of Band Structure Origin in Centrosymmetric Ferromagnets.** H. Park[1], *H. Ko*[2], G. Go[2], J. Oh[3], K. Kim[4] and K. Lee[2] *1. KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, The Republic of Korea; 2. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 3. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 4. Center of Spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea*

DPA-13. **Unconventional Spin Pumping and Magnetic Damping in an Insulating Compensated Ferrimagnet.** *Y. Li*[1] *1. Physical Science and Engineering, King Abdullah University of Science and Technology (KAUST), Jeddah, Saudi Arabia*

DPA-14. **Spin-Pump-Induced Spin Transport in A Thermally Evaporated Naphthyl Diamine Derivative Film.** *E. Shikoh*[1,2], Y. Onishi[2] and Y. Teki[1,2] *1. Osaka Metropolitan University, Osaka, Japan; 2. Osaka City University, Osaka, Japan*

DPA-15. **Optical spin-orbit torque measurement of poly-Bi/CoFeB bilayer.** *S. Kim*[1] *1. Department of Energy Science, Sungkyunkwan University, Suwon, The Republic of Korea*

DPA-16. **An Electromotive Force in Pt/VO_2/$Ni_{80}Fe_{20}$ Tri-Layer Junctions Under the Ferromagnetic Resonance.** *T. Nishimura*[1,2], F. Kishi[1], S. Yamauchi[1], T. Kanki[3] and E. Shikoh[1,2] *1. Osaka City University, Osaka, Japan; 2. Osaka Metropolitan University, Osaka, Japan; 3. Osaka University, Osaka, Japan*

DPA-17. **Independent Control of Spin-Orbit Torque.** *S. Lee*[1], J. Park[1], M. Kim[1], M. Kim[1], J. Shin[1] and S. Choe[1] *1. Seoul National University, Seould, The Republic of Korea*

Session DPB
SPIN CURRENTS, SPIN PUMPING, SPIN HALL, AND RELATED EFFECTS V (Poster Session)

Shoya Sakamoto, Chair
The University of Tokyo, Kashiwa, Japan

DPB-01. **Independent Control of Field-like Spin-Orbit Torque by Adjusting Ferromagnet Thickness.** *J. Yoon*[1], M. Kim[1], S. Lee[1], D. Kim[2] and S. Choe[1] *1. Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea; 2. Center for Spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea*

DPB-02. **Magneto-electric signal due to microwave heating in ferromagnetic/nonmagnetic bilayer system.** *S. Obinata*[1], R. Iimori[1], R. Kajima[1], T. Tanaka[1] and T. Kimura[1] *1. Physics, Kyushu University, Fukuoka, Japan*

DPB-03. **Spin Hall magnetoresistance of $CoFe_2O_4$/Pt heterosturctures with interface non-collinear magnetic configurations.** *J. Guo*[1], K. Meng[1], T. Zhang[1], J. Liu[1], J. Chen[1], Y. Wu[1], X. Xu[1] and Y. Jiang[1] *1. University of Science and Technology Beijing, Beijing, China*

DPB-04. **Generation of Spin-wave Soliton using Magnetostatic Surface Mode.** *T. Iwata*[1], T. Eguchi[1] and K. Sekiguchi[1] *1. Yokohama National University, Yokohama, Japan*

DPB-05. **Mechanical Spin Current Generation via Intrinsic Spin-Orbit Interaction with Spatial Inversion Symmetry.** *Y. Ogawa*[1] and H. Kohno[1] *1. Physics, Nagoya University, Nagoya, Japan*

DPB-06. **Transition from digital to analog spin-orbit torque switching in PtMn/$(Co/Pd)_n$/Ta heterostructures using current treatment.** *A. Ranjan*[1] *1. Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan*

DPB-07. **Electrical Determination of Magnetization Switching in In-plane Anisotropy Spin-orbit Systems.** *Y. Huang*[1], Y. Lin[1], Y. Wu[1] and Y. Tseng[1] *1. Materials Science & Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan*

DPB-08. **Microfabrication and Characterization of Ferromagnetic Metal/Nonmagnetic Semiconductor Junctions for Spin Pumping-Induced Highly Efficient Spin Injection.** *T.S. Balland*[1,2], T. Seki[2,3], T. Yamazaki[2], R.Y. Umetsu[2], M. Ogawa[4], T. Uemura[4] and K. Takanashi[2,5] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Institute for Materials Research, Tohoku University, Sendai, Japan; 3. JST-CREST, Tokyo, Japan; 4. Faculty of Information Science and Technology, Hokkaido University, Sapporo, Japan; 5. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

DPB-09. **A new method for emitting spin-polarized electron.** Y. Chow[1], S. Chao[1], P. Jiang[2], C. Chang[1] and *C. Chang*[1] *1. Department of Electronic Engineering, Mingshin University of Science and Technology, Hsinchu, Taiwan; 2. Department of Mechanical Engineering, Minghsin University of Science and Technology, Hsinchu, Taiwan*

DPB-10. **Observation of Anomalous Nernst Effect in Flexible Co-Pt Nanoparticle Assembled Films Fabricated by Chemical Processes.** *Y. Kurokawa*[1], K. Yamada[2], H. Matsui[2], M. Shima[2] and H. Yuasa[1] *1. Graduate School and Faculty of Information Science and Electrical Engineering, Kyushu University, Fukuoka, Japan; 2. Graduate School of Natural Science and Technology, Gifu University, Gifu, Japan*

DPB-11. **Four-terminal sensing of laser-induced anomalous-Nernst voltages.** *S. Mochizuki*[1], T. Obayashi[1], I. Sugiura[2], Y. Shiota[2], T. Moriyama[2], T. Ono[2], T. Satoh[1] and K. Yamada[1] *1. Department of Physics, Tokyo Institute of Technology, Meguro, Japan; 2. Institute of Chemical Research, Kyoto University, Uji, Japan*

DPB-12. **Acoustic Spin Rotation in Heavy-Metal-Ferromagnet Bilayers.** *Y. Cao*[1], H. Ding[1], Y. Zuo[1], N. Lei[2], J. Cao[1], M. Si[1], L. Xi[1], C. Jia[1], D. Xue[1] and D. Yang[1] *1. School of Physical Science and Technology, Lanzhou University, Key Laboratory for Magnetism and Magnetic Materials of Ministry of Education, Lanzhou University, Lanzhou 730000, China, Lanzhou, China; 2. School of Integrated Circuit Science and Engineering, Fert Beijing Institute, MIIT Key Laboratory of Spintronics, School of Integrated Circuit Science and Engineering, Beihang University, Beijing 100191, China, Beijing, China*

DPB-13. **Determination of Spin Transport Properties of Non-collinear Antiferromagnets in Tunnel Junctions.** *C. Fang*[1], B.K. Hazra[1] and S. Parkin[1] *1. NISE, Max Planck Institute for Microstructure Physics, Halle (Saale), Germany*

DPB-14. **First-Principles Simulation of Anomalous- and Spin-Hall Effect in Fe–Co Disordered Systems.** *Y. Kota*[1] and A. Sakuma[2] *1. National Institute of Technology, Fukushima College, Iwaki, Japan; 2. Department of Applied Physics, Tohoku University, Sendai, Japan*

DPB-15. **Experimental and Theoretical Evaluation for Pressure Effects on Spin Hall Effect in Pt.** *R. Iimori*[1], S. Obinata[1], T. Yamazaki[1], A. Mitsuda[1] and T. Kimura[1] *1. Physics, Kyushu University, Fukuoka, Japan*

DPB-16. **Spin-orbit effective fields generated by geometric rotation induced novel spin polarization.** *C. Pan*[1] and X. Qiu[1] *1. School of Physics Science and Engineering, Tongji University, Shanghai, China*

DPB-17. **Detecting spin hall signals of permalloy and heavy metal using inverse spin Hall effect.** *K. Lai*[1], D. Shiu[1], N. Liang[1], C. Chang[1] and L. Horng[1] *1. National Changhua University of Education Department of Physics, Changhua, Taiwan*

POSTER SESSION

Session DPC
VOLTAGE-CONTROLLED ANISOTROPY AND SPIN-CURRENTS (Poster Session)

Saroj Dash, Co-Chair
Chalmers Tekniska Hogskola, Gothenburg, Sweden
Lakhan Bainsla, Co-Chair
Chalmers University of Technology, Gothenburg, Sweden

DPC-01. **Sub-Volt Switching of Nanoscale Voltage-Controlled Magnetic Random-Access Memory Cell.** *Y. Shao*[1], V. Lopez-Dominguez[1], N. Davila[2], Q. Sun[3], N. Kioussis[4], J. Katine[2] and P. Khalili[1] *1. Department of Electrical and Computer Engineering, Northwestern University, Evanston, IL, United States; 2. Western Digital, San Jose, CA, United States; 3. School of Science, Shandong Jianzhu University, Jinan, China; 4. Department of Physics and Astronomy, California State University, Northridge, CA, United States*

DPC-02. **Voltage control of frequency and effective damping in nano-constriction-based spin Hall nano-oscillators.** *V. Gonzalez*[1], R. Khymyn[1], H. Fulara[2], A.A. Awad[1] and J. Åkerman[1] *1. University of Gothenburg, Gothenburg, Sweden; 2. Indian Institute of Technology, Roorkee, India*

DPC-03. **Systematic study of the strength of VCMA effect in nanomagnets of small and large strength of spin-orbit interaction.** *V. Zayets*[1], I. Serdeha[2] and V. Grygoruk[2] *1. Platform Photonics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. Educational and Scientific Institute of High Technologies, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

DPC-04. **Magnetic compensation behavior driven by excess Mn in ferrimagnet $Mn_{2.21}Ru_{0.86}Ga$ thin films.** *C. Dou*[1], X. Xu[1], K. Yang[2], C. Li[1], T. Zhang[1], Z. Zhu[1], X. Zhao[1], K. Meng[1], Y. Wu[1], J. Chen[1], M. Yang[2] and Y. Jiang[1] *1. University of Science and Technology Beijing, Beijing, China; 2. The Hong Kong Polytechnic University, Hong Kong, China*

DPC-05. **Write-error rate estimation of voltage-controlled magnetization switching in a magnetic-topological-insulator-based device.** *T. Komine*[1], S. Watahiki[1] and T. Chiba[2] *1. Ibaraki University, Ibaraki, Japan; 2. Fukushima National College of Technology, Fukushima, Japan*

DPC-06. **Engineering of Voltage Controlled Magnetic Anisotropy Magnetic Tunnel Junctions at Cryogenic Temperatures.** *P. Brandao Veiga*[1], R. Sousa[1], L.D. Buda-Prejbeanu[1], S. Auffret[1], L. Vila[1], I. Joumard[1], I. Prejbeanu[1] and B. Dieny[1] *1. CEA-SPINTEC, Grenoble, France*

DPC-07. **Electrically controllable exchange bias via interface magnetoelectric effect.** *A.B. Cahaya*[1], A.A. Anderson[1], A. Azhar[2] and M.A. Majidi[1] *1. Physics, Universitas Indonesia, Depok, Indonesia; 2. UIN Syarif Hidayatullah Jakarta, Jakarta, Indonesia*

DPC-08. **Withdrawn**

DPC-09. **Comparative study on the origin of spin Hall effect in poly and single crystalline α-W in W/CoFeB bilayers.** *M. Talluri*[1,2], Z. Wen[1], C. Murapaka[1] and S. Mitani[1] *1. Spintronics Group, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Materials Science and Metallurgical Engineering, IIT Hyderabad, Hyderabad, India*

DPC-10. **Large spin Hall conductivity in epitaxial thin films of non-collinear antiferromagnet Mn_3Sn.** *H. Bangar*[1], K. Imtiyaz Ali Khan[1], A. Kumar[2], N. Chowdhury[1], P. Muduli[3] and P. Kishor Muduli[1] *1. Department of Physics, Indian Institute of Technology Delhi, New Delhi, India; 2. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 3. Department of Physics, Indian Institute of Technology Madras, Chennai, India*

DPC-11. **Manipulating Sign and Amplitude of Interlayer Dzyaloshinskii-Moriya Interaction by Electrical Currents.** *F. Kammerbauer*[1], W. Choi[1], F. Freimuth[1,2], K. Lee[1,3], R. Frömter[1], D. Han[4], R. Lavrijsen[5], H. Swagten[5], Y. Mokrousov[1,2] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 2. Forschungszentrum Julich, Jülich, Germany; 3. Korea University, Sejong, The Republic of Korea; 4. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 5. Eindhoven University of Technology, Eindhoven, Netherlands*

DPC-12. **Acoustic spin transport in *s*-wave superconductors.** *T. Funato*[2], A. Yamakage[1] and M. Matsuo[3] *1. Nagoya University, Nagoya, Japan; 2. Keio University, Yokohama, Japan; 3. University of Chinese Academy of Sciences, Beijing, China*

DPC-13. **Effect of sputtering process parameters on tungsten structural phases and its spin Hall angle.** K. Sriram[1], R. Mondal[1], Y. Pappu[1], J. Pradhan[2], A. Haldar[2] and *C. Murapaka*[1] *1. Department of Materials Science and Metallurgical Engineering, Indian Institute of Technology Hyderabad, Sangareddy, India; 2. Department of Physics, Indian Institute of Technology Hyderabad, Sangareddy, India*

DPC-14. **Single Domain Spin Orbit Torque Enabled Magnetic Field Sensor With Offset Compensation.** *S. Zeilinger*[1,2], J. Guettinger[2], A. Satz[2], S. Koraltan[1] and D. Suess[1] *1. Physics of Functional Materials, University of Vienna, Vienna, Austria; 2. Infineon Technologies Austria, Villach, Austria*

Session EOA
BIOMAGNETICS I: THERAPY AND DIAGNOSTICS

Ron Goldfarb, Co-Chair
National Institute of Standards and Technology, Boulder, CO, United States

Maria Luisa Fernandez Gubieda, Co-Chair
Universidad del Pais Vasco, Leioa, Spain

EOA-01. **Magnetotactic Bacteria: Biorobots for Targeted Therapies and Model Nanomagnetic Systems.** ***(Invited)*** *J. Alonso*[1], D. Gandia[2], E. M. Jefremovas[1,3], L. Gandarias[4], D. Villanueva[5], N. Lete[5], L. Marcano[6,5], A. García-Prieto[9], I. Orue[7], L. Fernández Barquín[1], D. de Cos Elices[8], A. García-Arribas[5,2], A. Muela[4] and M. Fernandez Gubieda[5,2] *1. CITIMAC, Universidad de Cantabria, Santander, Spain; 2. BCMaterials, Leioa, Spain; 3. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 4. Inmunología, Microbiología y Parasitología, Universidad del País Vasco (UPV/EHU), Leioa, Spain; 5. Electricidad y Electrónica, Universidad del País Vasco (UPV/EHU), Leioa, Spain; 6. Física, Universidad de Oviedo, Oviedo, Spain; 7. SGIker Medidas Magnéticas, Universidad del País Vasco (UPV/EHU), Leioa, Spain; 8. Física Aplicada, Universidad del País Vasco (UPV/EHU), Vitoria, Spain; 9. Física Aplicada, Universidad del País Vasco (UPV/EHU), Bilbao, Spain*

EOA-02. **Evaluation of alternative magnetic nanoparticle materials for biomedical applications.** *I. Dirba*[1], C.K. Chandra[1], Y. Ablets[1] and O. Gutfleisch[1] *1. Institute of Materials Science, TU Darmstadt, Darmstadt, Germany*

EOA-03. **Iron oxide nanoparticles as a new tool for treating cardiovascular diseases. *(Invited)*** *D. Cabrera*[2], J. Ranjbar[1], A. Santana-Otero[3], M. Eizadi Sharifabad[2], D. Ortega[3], N. Telling[2] and A. Harper[1] *1. School of Medicine, Keele University, Keele, Newcastle under Lyme, United Kingdom; 2. School of Pharmacy and Bioengineering, Guy Hilton Research Centre, Keele University, Stoke on Trent, United Kingdom; 3. Condensed Matter Physics Department, University of Cádiz, Puerto Real, Cadiz, Spain*

EOA-04. **Withdrawn**

EOA-05. **From thermographical data to 2D temperature maps: how to evaluate performance for magnetic hyperthermia experiments in phantoms.** *D.P. Valdés*[1,2], T.E. Torres[1,2], A.C. Moreno Maldonado[3], G. Urretavizcaya[4], M.S. Nadal[1], M. Vasquez Mansilla[1], R.D. Zysler[1,2], G.F. Goya[3], E. De Biasi[1,2] and E. Lima Jr.[1] *1. Instituto de Nanociencia y Nanotecnología, CNEA-CONICET, Bariloche, Argentina; 2. Instituto Balseiro, UNCuyo, Bariloche, Argentina; 3. Departamento de Física de la Materia Condensada, INMA, UNIZAR, Zaragoza, Spain; 4. Consejo Nacional de Investigaciones Científicas y Técnicas, CNEA, Bariloche, Argentina*

EOA-06. **Synthetic Antiferromagnet Disk Particles for Hyperthermia.** S. Scheibler[1], I.K. Herrmann[3], D. Suess[4], M. Krupinski[5], M. Graeser[6,7] and *H.J. Hug*[1,2] *1. Magnetic and Functional Thin Films, Empa, Duebendorf, Switzerland; 2. Physics, University of Basel, Basel, Switzerland; 3. Dep. of Mechanical and Process Eng., ETH Zurich, Zurich, Switzerland; 4. Physics of Functional Materials, University of Vienna, Vienna, Austria; 5. Polish Academia of Science, The Henryk Niewodniczanski Institute of Nuclear Physics, Krakow, Poland; 6. Luebeck University, Luebeck, Germany; 7. Individualized and Cell-based Medical Engineering, Fraunhofer Research Institution, Luebeck, Germany*

EOA-07. **Exchange bias, magnetic fluid hyperthermia, and cellular uptake by endothelial cells in core-shell Fe@Fe_3O_4 nanoparticles.** *K. Riahi*[1], I. Dirba[1], Y. Ablets[1], N. Sultana Shaik[2], E. Adabifiroozjaei[2], A. Filatova[3], L. Molina-Luna[2], U. Nuber[3] and O. Gutfleisch[1] *1. Functional Materials, Institute of Materials Science,TU Darmstadt, Darmstadt, Germany; 2. Advanced Electron Microscopy Division, Institute of Materials Science, Darmstadt, Germany; 3. Stem Cell and Developmental Biology, TU Darmstadt, Darmstadt, Germany*

EOA-08. **MagPure Chip: A Microfluidic Device to Isolate Viable Circulating Tumor Cells.** *D. Le Roy*[1], L. Descamps[2,1], J. Garcia[3], D. Barthélémy[3], E. Laurenceau[4], S. Cavassila[5], L. Payen[3] and A. Deman[2] *1. Institut Lumière Matière, ILM UMR5306, Université Claude Bernard Lyon 1, Villeurbanne, France, Villeurbanne, France; 2. Institut des Nanotechnologies de Lyon, INL UMR5270, Université Claude Bernard Lyon 1, Villeurbanne, France., Villeurbanne, France; 3. Laboratoire de Biochimie et Biologie Moléculaire, CICLY UR3738, Groupe Hospitalier Sud, HCL, Pierre Bénite, France., Pierre Bénite, France; 4. Institut des Nanotechnologies de Lyon, INL UMR5270, Ecole Centrale de Lyon, Ecully, France., Ecully, France; 5. CREATIS, Univ Lyon, INSA Lyon, Université Claude Bernard Lyon 1, UJM Saint Etienne, CNRS, Inserm, CREATIS UMR 5220, U1206, F69621, LYON, France., Lyon, France*

EOA-09. **Effect of Substitution in the Heating Efficiency of $CuFe_2O_4$ Nanoparticles for Magnetic Hyperthermia Application.** *G. Phukan*[1] and J. Borah[1] *1. Department of Science And Humanities, National Institute of Technology Nagaland, Dimapur, India*

EOA-10. **Revealing the relation between the magnetic anisotropy and the heating efficiency of different magnetotactic bacteria species.** D. Gandia[1], L. Gandarias[3], L. Marcano[2], D. Villanueva[1], A.G. Gubieda[3], A. Abad[3], A. García Prieto[4], J. Alonso[5] and *M. Fernandez Gubieda*[1] *1. Electricidad y Electronica, Universidad Del Pais Vasco, Leioa, Spain; 2. Física, Universidad de Oviedo, Oviedo, Spain; 3. Inmunología, Microbiología y Parasitología, Universidad Del Pais Vasco, Leioa, Spain; 4. Física Aplicada, Universidad Del Pais Vasco, Bilbao, Spain; 5. CITIMAC, Universidad de Cantabria, Santander, Spain*

EOA-11. **Ultrafast Heating Rate of Ultrasmall Gold-coated Iron Oxide Magnetic Nanoparticles by Ferromagnetic Resonance.** *L. Tonthat*[1], A. Kuwahata[1], T. Ogawa[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan*

EOA-12. **Ferromagnetic resonance heating of magnetic nanoparticles Resovist for biomedical applications.** *W. Szawro*[1,2], A. Kuwahata[1,3], T. Kagami[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan; 2. Faculty of Chemistry, Warsaw University of Technology, Warsaw, Poland; 3. Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan*

EOA-13. **Multifunctional nano-probes for cancer diagnosis and therapy based on iron carbide nanoparticles.** *J. Yu*[1] *1. College of Materials Science and Engineering, Zhejiang University of Technology, Hangzhou, China*

Session EOB
BIOMAGNETICS II: SENSORS AND DEVICES

Zoe Boekelheide, Co-Chair
Lafayette College, Easton, PA, United States
Sachiko Yamaguchi-Sekino, Co-Chair
National Institute of Occupational Safety and Health, Japan, Kawasaki, Japan

EOB-01. **Glioblastoma Cancer Cells Destruction by Mechanical Stimulation Using Magnetic Particles: In vitro Versus In vivo Assays and Investigations in 3D Gels.** ***(Invited)*** C. Naud[1,5], C. Thébault[1], A. Visonà[1,2], H. Joisten[1,4], F. Berger[5], M. Carrière[3], Y. Hou[3], A. Nicolas[2], B. Dieny[1] and *R. Morel*[1] *1. CEA-SPINTEC, Grenoble, France; 2. LTM\ CNRS, Grenoble, France; 3. CEA-SyMMES, Grenoble, France; 4. CEA-LETI, Grenoble, France; 5. INSERM/ BrainTechLab, Grenoble, France*

EOB-02. **High Gradient Magnetic Separator Design with Hybrid Poles and Increased Efficiency.** *C. Li*[1], H. King[1], A. Toy[1], Y. Kanevskiy[1], I. Ambriz[1] and p. Paiz[1] *1. R&D Engineering, Dexter Magnetic Technologies Inc., Elk Grove Village, IL, United States*

EOB-03. **Factors Affecting Magnetic Particle Imaging: Frequency-Sustained Hysteresis and Dipole-dipole Interactions, Challenges and Solutions.** ***(Invited)*** G. Barrera[1], P. Allia[1] and *P. Tiberto*[1] *1. Advance Materials and Life sciences, INRIM, Torino, Italy*

EOB-04. **Development of a human size magnetic particle imaging device for breast cancer sentinel lymph node biopsy.** B. Shi[1,3], *L. Gai*[1], Q. Zhang[1], Y. Kang[2], Z. Liu[1,3], T. Li[1], F. Hou[1], H. Cui[1], Y. He[1,4] and M. Zhang[5] *1. School of Information Science and Engineering, Shenyang University of Technology, Shenyang, China; 2. Department of Breast Surgery, Cancer Hospital of Dalian University of Technology, Cancer Hospital of China Medical University, Liaoning Cancer Hospital & Institute, Shenyang, China; 3. Liaoning Magnetic Medical Sensing and Treatment Technological Innovation Center, Liaoning Jiayin Medical Technology, Shenyang, China; 4. Keio University, Yokohama, Japan; 5. First Affiliated Hospital, China MedicalUniversity, Shenyang, China*

EOB-05. **An MRI-Compatible Implantable Magnet Design with Self-Realigning Orientation.** *B. Zhang*[1], A. Hirka[1] and Y. Kanevskiy[1] *1. Dexter Magnetic Technologies inc., Elk Grove Village, IL, United States*

EOB-06. **Giant Magnetoresistive Biosensing Platform for Point-of-Care Gene Expression Analysis.** *A. de Olazarra*[1] and S.X. Wang[1,2] *1. Electrical Engineering, Stanford University, Stanford, CA, United States; 2. Materials Science and Engineering, Stanford University, Stanford, CA, United States*

EOB-07. **The Induced Electric Field in the Head Model With Titanium Skull Plate During Transcranial Magnetic Stimulation.** *M. Lu*[1] and S. Ueno[2] *1. Lanzhou Jiaotong University, Lanzhou, China; 2. The University of Tokyo, Tokyo, Japan*

EOB-08. **Development of a Non-magnetic Helical Sensor Drive Mechanism for Magnetocardiography Multipoint Measurement in Animals.** *W. Shang*[1], M. Fushimi[1], S. Chikaki[1] and M. Sekino[1] *1. Graduate School of Engineering, The University of Tokyo, Tokyo, Japan*

EOB-09. **Proposal of a Method for Estimating the Position of Ferromagnetic Markers under Magnetization Conditions.** *Y. Inoue*[1], S. Chikaki[1], M. Fushimi[1], Y. Xiao[1], A. Kuwahata[2], M. Kusakabe[3,4] and M. Sekino[1] *1. Graduate School of Engineering, The University of Tokyo, Bunkyo-ku, Japan; 2. Graduate School of Engineering, Tohoku University, Aoba-ku, Japan; 3. Graduate School of Agricultural and Life Sciences, Research Center for Food Safety, The University of Tokyo, Bunkyo-ku, Japan; 4. Matrix Cell Research Institute Inc., Ushiku, Japan*

EOB-10. **Reconstruction of the Electrical Properties in Human Bodies Based on the Estimation of the Unmeasurable Magnetic Fields.** *N. Eda*[1] and T. Nara[1] *1. The Graduate School of Information Science and Technology, The University of Tokyo, Tokyo, Japan*

EOB-11. **Dipolar Interaction Effect on Harmonics in Liner Chain Magnetic Nanoparticles.** *H. Zhang*[1], Y. Sun[1], S. Yamamura[1], T. Sasayama[1] and T. Yoshida[1] *1. Kyushu University, Fukuoka, Japan*

EOB-12. **Low-Concentration Magnetic Particle Spectroscopy Using Gradiometric Receive Coil-Coupled Magnetoresistive Sensor.** *S. Trisnanto*[1], T. Kasajima[2], T. Shibuya[2] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. Technology and Intellectual Property HQ, TDK Corporation, Tokyo, Japan*

EOB-13. **Optimization Of Receive Coil Shape For Highly Sensitive MRI In Deep Local Region.** *M. Takahashi*[1], M. Fushimi[2], M. Sekino[2], S. Yabukami[1] and A. Kuwahata[1] *1. Tohoku University, Sendai, Japan; 2. The University of Tokyo, Tokyo, Japan*

EOB-14. **Wireless Magnetoelectric Neural Interfaces.** *E. Zhang*[1], M. Abdel-Mottaleb[2], J. Shulgach[3], M. Alberteris Campos[1], M. Murphy[3], B. Navarrete[1], S. Chen[1,4], V. Andre[2], M. Shotbolt[2], D. Griffin[3], D. Weber[3], P. Liang[5] and S. Khizroev[1] *1. Electrical and Computer Engineering, University of Miami, Coral Gables, FL, United States; 2. Biomedical Engineering, University of Miami, Coral Gables, FL, United States; 3. Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 4. Chemical, Environmental, and Materials Engineering, University of Miami, Coral Gables, FL, United States; 5. Cellular Nanomed Inc, Irvine, CA, United States*

POSTER SESSION

Session EPA
BIOMEDICAL DIAGNOSTICS AND IMAGING (Poster Session)

David Cabrera, Co-Chair
Keele University, Stoke on Trent, United Kingdom
Akihiro Kuwahata, Co-Chair
Tohoku University, Miyagi, Japan

EPA-01. **Evaluation of Superconducting Self-Shield and Zero Boil-Off Magnetoencephalogram Systems Using Dry Phantom.** *K. Tanaka*[1], A. Tsukahara[1], Y. Miyanaga[2], K. Yokoyama[2], T. Yamaguchi[2], S. Tsunematsu[2], T. Kato[2] and Y. Matsubara[2] *1. School of Science and Engineering, Tokyo Denki University, Hatoyama, Japan; 2. Sumitomo Heavy Industries, Ltd., Yokosuka, Japan*

EPA-02. **High Efficiency Magnetic Induction System Development with Synchronous MPI Imaging.** B. Shi[1], *X. Zhang*[1], Y. Zou[1], Z. Liu[1], Y. Lin[1], P. Huang[1] and Y. Takashi[2] *1. Shenyang University of Technology, Shenyang City in Liaoning Province, China; 2. Kyushu University, Fukuoka, Japan*

EPA-03. **Estimation of Q-factor of Composite Heating Element for Magnetic Hyperthermia.** *T. Takura*[1], H. Sunaguchi[1] and K. Takahashi[1] *1. Tohoku Institute of Technology, Sendai, Japan*

EPA-04. **Drug targeting system for guiding? magnetic nanoparticles toward a blood vessel wall using an array of permanent magnets.** *B. Son*[1] and J. Yoon[1] *1. School of Integarated Technology, Gwangju Institute of Science and Technology (GIST), Gwnagju, The Republic of Korea*

EPA-05. **Effect of the static magnetic field bias on the dynamic hysteresis loop of a magnetic nanoparticle suspension.** *R. Onodera*[1], E. Kita[1,2], T. Kuroiwa[3] and H. Yanagihara[2] *1. National Institute of Technology, Ibaraki College, Hitachinaka, Japan; 2. Department of Applied Physics, University of Tsukuba, Tsukuba, Japan; 3. Graduate school of Science and Engineering, University of Tsukuba, Tsukuba, Japan*

EPA-06. **Magnetic Resonance Imaging Using a Magnetoresistive Sensor with a Flux Transformer.** *D. Oyama*[1], Y. Adachi[1] and N. Tsuyuguchi[2,3] *1. Applied Electronics Laboratory, Kanazawa Institute of Technology, Kanazawa, Japan; 2. Department of Neurosurgery, Kindai University, Osakasayama, Japan; 3. Neurosurgery, Naniwaikuno Hospital, Osaka, Japan*

EPA-07. **Magnetic nanowires versus nano/micro-particles for cancer cell destruction by magneto-mechanical actuation.** H. Chiriac[1], A. Minuti[1,2], C. Stavila[1,2] and *N. Lupu*[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania; 2. Faculty of Physics, Alexandru Ioan Cuza University of Iasi, Iasi, Romania*

EPA-08. **Dynamics of magnetization under spin-lock pulse with T_1 relaxation.** *H. Ueda*[1] and Y. Ito[1] *1. Department of Electrical Engineering, Kyoto University, Kyoto, Japan*

EPA-09. **Magnetic Hyperthermia Properties of Green Synthesized $CoFe_2O_4$/ZnS Nanocomposites Utilizing *Moringa Oleifera* Extract.** *D.A. Larasati*[1], D.L. Puspitarum[1], M.Y. Darmawan[1], N.I. Istiqomah[1], J. Partini[1], D. Oshima[2], T. Kato[2] and E. Suharyadi[1] *1. Physics, Universitas Gadjah Mada, Yogyakarta, Indonesia; 2. Nagoya University, Nagoya, Japan*

EPA-10. **Dynamic magnetization and specific loss powers of commercial magnetic nanoparticles.** *H. Obana*[1], S. Ota[2], S. Takeuchi[1], S. Trisnanto[1] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. Electrical and Electronic Engineering, Shizuoka University, Hamamatsu, Japan*

EPA-11. **Detection of Magnetic Nanoparticles Using Drive and Receive Coils for Head-Size Magnetic Particle Imaging.** *H. Ahn*[1], K. Suzuki[1], S. Trisnanto[1], S. Ota[2], T. Yoshida[3] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. Electrical and Electronic Engineering, Shizuoka University, Hamamatsu, Japan; 3. Electrical Engineering, Kyushu University, Fukuoka, Japan*

EPA-12. **Formulation and in-vitro evaluations of hedgehog pathway inhibitor drugs loaded polymer coated magnetic nanocarriers for hyperthermia and targeting Hep 1-6 liver cancer cells.** G.C. Hermosa[1], L. Fang[2], C. Liao[1], C. Chang[3] and *A.A. Sun*[1,4] *1. Department of Chemical Engineering & Materials Science, Yuan Ze University, Taoyuan, Taiwan; 2. Department of Mechanical and Industrial Engineering, Vanung University, Taoyuan, Taiwan; 3. Department of Medical Research, Far Eastern Memorial Hospital, New Taipei City, Taiwan; 4. Graduate School of Biotechnology and Bioengineering, Yuan Ze University, Taoyuan, Taiwan*

EPA-13. **The Pulse Magnetic Field Controls the TNF-α of the BALB_C Mice Injected with LPS.** *S. Kim*[1], B. Lee[1], J. Moon[1], M. Ahn[1] and H. Lee[1] *1. Sangji University, Wonju, The Republic of Korea*

POSTER SESSION

Session EPB
BIOMEDICAL SENSORS AND DEVICES (Poster Session)

Javier Alonso, Co-Chair
University of Cantabria, Santander, Spain
Ravi Hadimani, Co-Chair
Virginia Commonwealth University, Richmond, VA, United States

EPB-01. **Investigation of EEG Functional Connectivity Relationship with TMS Response in Mild Traumatic Brain Injury Patients.** *M.Z. Hussain*[3], A. Jamil[1], L. Franke[2] and R.L. Hadimani[3,1] *1. Psychiatry, Harvard University, Boston, MA, United States; 2. Physical Medicine and Rehabilitation, Virginia Commonwealth University, Richmond, VA, United States; 3. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*

EPB-02. **Biocompatible Nanoparticles for DDS with Field-Dependent Radical Pair System.** *H. Nakagawa*[1], M. Fujimoto[2] and T. Tadokoro[1] *1. Department of Electrical and Electronic Engineering, Tokyo Denki University, Tokyo, Japan; 2. Department of Health and Nutrition, University of Human Arts and Sciences, Saitama, Japan*

EPB-03. **An ELF Magnetic Control Study of Metamorphic Qualities in T_4-Administrated Axolotls (*Ambystoma mexicanum*).** *H. Nakagawa*[1], M. Fujimoto[2] and T. Tadokoro[1] *1. Department of Electrical and Electronic Engineering, Tokyo Denki University, Tokyo, Japan; 2. Department of Health and Nutrition, University of Human Arts and Sciences, Tokyo, Japan*

EPB-04. **Shape Observation by Local illumination Using Reflected Light from Magnetically Controlled Guanine Crystal Platelet.** *H. Asada*[1], E. Muneyama[1], M. Kurahashi[1], K. Takeuchi[1] and M. Iwasaka[2] *1. Yamaguchi University, Ube, Japan; 2. Hiroshima University, Higashi-Hiroshima, Japan*

EPB-05. **Human Error Verification During ELF Stimuli: Retinal Receptivity of ELF-Inducing Phosphenes.** *H. Nakagawa*[1] and S. Ueno[2] *1. Department of Electrical and Electronic Engineering, Tokyo Denki University, Tokyo, Japan; 2. Department of Applied Quantum Physics, Kyushu University, Fukuoka, Japan*

EPB-06. **Calibration of AC Hysteresis Magnetometers for Magnetic Fluids.** *Z. Boekelheide*[1], J. Santos[1] and H. Steinthal[1] *1. Physics, Lafayette College, Easton, PA, United States*

EPB-07. **Hybrid Transcranial Magnetic Stimulation and Deep Brain Stimulation in the Presence of an Implantable Pulse Generator.** A. Mhaskar[1,2], *M. Tashli*[1], K. Holloway[4,5] and R.L. Hadimani[1,3] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Center for Medical Sciences, Mills E. Godwin High School, Richmond, VA, United States; 3. Department of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 4. Hunter Holmes McGuire Veterans Affairs Medical Center, McGuire Research Institute, Richmond, VA, United States; 5. Department of Neurosurgery, Virginia Commonwealth University, Richmond, VA, United States*

EPB-08. **Human Skull Implantable Wireless Power Transfer System.** Ú.d. Resende[1], *M.D. Almeida*[1] and I.V. Soares[2] *1. Electrical Engineering, CEFET-MG, Belo Horizonte, Bouvet Island; 2. Institut d'Electronique et de Telecommunications de Rennes, Université de Rennes 1, Rennes, France*

EPB-09. **Effects of Magnetic Field and Magnetic Force on Proliferation and Differentiation of Osteoblast cells.** *S. Yamaguchi-Sekino*[1] and M. Sekino[2] *1. Work Environment Research Group, National Institute of Occupational Safety and Health, Japan, Kawasaki, Japan; 2. Department of Bioengineering, School of Engineering, The University of Tokyo, Tokyo, Japan*

EPB-10. **Investigation of Resting Motor Threshold Variabiliy in Schizophrenia Patients during Transcranial Magnetic Stimulation.** C.J. Lewis[1], E. Cheng[1], U.M. Mehta[3], A.K. Pandurangi[4] and *R.L. Hadimani[2,5] 1. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Psychiatry, National Institute of Mental Health & Neurosciences, Bangalore, India; 4. Psychiatry, Virginia Commonwealth University, Richmond, VA, United States; 5. Psychiatry, Harvard Medical School, Boston, MA, United States*

EPB-11. **Dry-type phantom emulating quadrupole-like magnetic field distribution for evaluation of magnetoneurography.** *Y. Adachi*[1], D. Oyama[1], G. Uehara[1] and S. Kawabata[2] *1. Applied Electronics Laboratory, Kanazawa Institute of Technology, Kanazawa, Japan; 2. Tokyo Medical and Dental University, Tokyo, Japan*

EPB-12. **Withdrawn**

EPB-13. **Simplified Magnetic Flux Density Measurement for Local Resolution Analysis of Transcranial Magnetic Stimulation.** *T. Torii*[2], H. Sakamoto[1] and A. Sato[2] *1. Department of Clinical Engineering, Komatsu University, Komatsu, Japan; 2. Department of Human Information Engineering, Tokai University, Kumamoto, Japan*

ORAL SESSIONS

Session FOA
ANALYTICAL, SEMI-ANALYTICAL AND NUMERICAL MODELLING FOR DESIGN AND ANALYSIS OF ELECTRICAL MACHINES I

Yacine Amara, Co-Chair
Université Le Havre Normandie, Le Havre, France
Abdelmounaim Tounzi, Co-Chair
Univ. Lille, Arts et Metiers Institute of Technology, Villeneuve d'Ascq, France

FOA-01. **Analytical Modelling of Cogging Torque Based on Harmonic Action.** *L. Dai*[1], W. Zhang[2], J. Gao[1] and S. Huang[1] *1. College of Electrical and Information Engineering, Hunan University, Changsha, China; 2. Changsha University, Changsha, China*

FOA-02. **Analytical Model for Electromagnetic Field in Permanent Magnet Synchronous Motor Considering Stator Slotting and Rotor Eccentricity.** *Q. Wei*[1], Y.W. Li[1], J.Z. Shuai[1] and D. Zeng[2] *1. College of Power and Energy Engineering, Harbin Engineering University, Harbin, China; 2. College of Intelligent Systems Science and Engineering, Harbin Engineering University, Harbin, China*

FOA-03. **Experimental Validation of a Mesh-to-Mesh Magnetic Force Projection for e-NVH Simulation.** *R. Pile*[1], J. Le Besnerais[2], M. Glesser[2], G. Parent[1] and Y. Le Menach[3] *1. LSEE, Université d'Artois, Béthune, France; 2. EOMYS Engineering, Villeneuve d'Ascq, France; 3. L2EP, Université de Lille, Lille, France*

FOA-04. **Approximation of nonlinear properties of soft-magnetic materials with Bézier curves.** *E. Rahmanović*[1] and M. Petrun[1] *1. UM FERI, Maribor, Slovenia*

FOA-05. **3-D Stray Loss Evaluation of Structural Component under Harmonic and DC-Biased Magnetization by Harmonic-Balanced Method.** S. Gao[1], *X. Zhao*[1], L. Liu[3], K. Muramatsu[2], Y. Gao[4] and B. Forghani[5] *1. North China Electric Power University, Baoding, China; 2. Saga University, Saga, Japan; 3. Hebei Provincial Key Laboratory of Electromagnetic and Structural Performance of Power Transmission and Transformation Equipment, Baoding, China; 4. Oita University, Oita, Japan; 5. A Siemens Business, Montreal, QC, Canada*

FOA-06. **High-Speed Iron Loss Calculation of Permanent Magnet Synchronous Motor Combining Reluctance Network Analysis and One-Dimensional Magnetic Circuit Models Considering Dynamic Hysteresis Behavior.** *Y. Hane*[1] and K. Nakamura[1] *1. Electrical Engineering, Tohoku University, Sendai, Japan*

FOA-07. **Comparison of the Finite Element Method and High-Order Isogeometric Analysis for Modeling Magnetic Vector Hysteresis.** *B. Daniels*[1], M. Curti[1], T. Overboom[2] and E. Lomonova[1] *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Royal SMIT Transformers (SGB-SMIT Group), Nijmegen, Netherlands*

FOA-08. **Equivalent 2D FEA Modeling Method for High-speed Electrical Machines with Litz Winding Considering Transposition Influence.** *H. Jiang*[1], J. Zhang[1], Z. Zhang[1] and G. Hu[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

FOA-09. **Development and Experimental Verification of Magnetic Loss Models for High-Speed Electric Drives.** *R. Zeinali*[1], D. Krop[1] and E. Lomonova[1] *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

FOA-10. **Novel Stator Slot Opening to Reduce Electrical Machine Bearing Currents.** *D. De Gaetano*[1], W. Zhu[1], X. Sun[1], X. Chen[1], A. Griffo[1] and G.W. Jewell[1] *1. Electronic and Electrical Engineering, The University of Sheffield, Sheffield, United Kingdom*

FOA-11. **Stator Optimization for a Novel Magnetic Levitation Actuator.** *G. Zuidema*[1], D. Krop[1] and E. Lomonova[1] *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

FOA-12. **Topology Optimization of Magnetic Actuator based on Reluctance Network Modeling and Adjoint Variable Method.** *M. Yin*[1], M. Naidjate[2], N. Bracikowski[1], A. Pierquin[1] and D. Trichet[1] *1. Nantes Université, Saint Nazaire, France; 2. École Polytechnique Montréal, Montréal, QC, Canada*

FOA-13. **Semi-analytical modeling for linear motors with conductive media in high-dynamic applications.** *A. Desikan*[1], D. Krop[1], B. De Bruyn[1] and E. Lomonova[1] *1. Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

FOA-14. **Dynamic Analysis of Eddy Current Damper for Multiple-Degree-of-Freedom Vibration.** *Y. Umekawa*[1], A. Heya[1] and T. Inoue[1] *1. Mechanical Systems Engineering, Nagoya University, Nagoya, Japan*

FOA-15. **Analysis of a Magnetic Damping Structure for Ball Balancer.** *S. Fukuda*[1], A. Heya[1] and T. Inoue[1] *1. Mechanical systems engineering, Nagoya University, Nagoya, Japan*

FOA-16. **Analysis of the amount of flux variation on the HTS surface by the oscillation of HTS magnetic bearing rotor.** R. Taniguchi[1], S. Ishida[1], K. Yagi[1] and *S. Ohashi*[1] *1. Department of Electrical and Electronic Engineering, Kansai University, Suita, Japan*

POSTER SESSION

Session FPA
ANALYTICAL, SEMI-ANALYTICAL AND NUMERICAL MODELLING FOR DESIGN AND ANALYSIS OF ELECTRICAL MACHINES II (Poster Session)

Shuangxia Niu, Co-Chair
The Hong Kong Polytechnic University, Kowloon, Hong Kong
Georges Barakat, Co-Chair
University of Le Havre, Le Havre, France

FPA-01. **Performance Prediction of a FMaSynRM Considering MTPA, FW, and MTPV Operating Conditions Using Open-Source FEA.** *C. Di*[1,2], X. Bao[1] and W. Jiang[2] *1. Hefei University of Technology, Hefei, China; 2. Luoyang Bearing Research Institute Co., Ltd., Luoyang, China*

FPA-02. **Design, Analysis, and Experimental Verification of a PM-Based Hybrid Brake System for Personal e-Mobility Applications.** *G. Choi*[1], J. Park[1] and G. Jang[1] *1. Inha University, Incheon, The Republic of Korea*

FPA-03. **Electromagnetic Analysis Technique and Experimental Study of Permanent Magnet Synchronous Machine Considering Axial Leakage Flux using Subdomain Method.** *K. Shin*[1], J. Lee[1], S. Sung[2] and J. Choi[3] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Korea Research Institute of Science and Ocean Engineering, Daejeon, The Republic of Korea; 3. Chungnam National University, Daejeon, The Republic of Korea*

FPA-04. **Electromagnetic Performance Analysis of a Bearingless Permanent Magnet Synchronous Motor by Model Order Reduction.** *K. Xu*[1], Y. Guo[1], G. Lei[1], J. Zhu[2] and X. Sun[3] *1. Faculty of Engineering and Information Technology, University of Technology Sydney, Sydney, NSW, Australia; 2. School of Electrical and Information Engineering, The University of Sydney, Sydney, NSW, Australia; 3. Automotive Engineering Research Institute, Jiangsu University, Zhenjing, China*

FPA-05. **Analytical Analysis of a Novel Axial-Radial Permanent Magnet Eddy-Current Coupling With Mechanical Magnetic Adjuster.** *Z. Li*[1], F. Bian[1] and X. Chai[1] *1. School of Electronic and Information, Zhongyuan University of Technology, Zhengzhou, China*

FPA-06. **Study of Levitation Characteristic against Vertical Displacement at Minimum Levitation Velocity in the Electrodynamic Suspension System with Damper Coils.** *S. Higashiike*[1], R. Yamamoto[1] and S. Ohashi[1] *1. Electrical and Electronic Engineering, Kansai University, Suita, Japan*

FPA-07. **Investigation of the Excess Loss of the Grain-Oriented Steel Sheets in A High-Frequency Range Considering Skin Effect.** *L. Chen*[1], X. Wen[1], T. Ben[2], P. Wei[1] and X. Zhang[3] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. Hubei Provincial Research Center on Microgrid Engineering Technology, China Three Gorges University, Yichang, China; 3. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

FPA-08. **Calculation of Iron Loss in Permanent Magnet Synchronous Motors Based on PSO-RNN.** *K. Xu*[1], Y. Guo[1], G. Lei[1], L. Liu[1] and J. Zhu[2] *1. Faculty of Engineering and Information Technology, University of Technology Sydney, Sydney, NSW, Australia; 2. School of Electrical and Information Engineering, The University of Sydney, Sydney, NSW, Australia*

FPA-09. **Analytical Calculation and Experiment of 3-D Electromagnetic Force of Permanent Magnet Electrodynamic Suspension System.** *F. Bu*[1], J. Xu[1] and J. Chen[1] *1. College of National Key Laboratory of Science and Technology on Vessel Intergrated Power System, Naval University of Engineering, Wuhan, China*

FPA-10. **Analysis and Modeling of Field Distributions in Tooth-Yoke Junction Close Slot Grain-Oriented Electrical Steel Electrical Machine.** Z. Li[1], *Y. Ma*[1], W. Li[1,2], Y. Li[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang, China; 2. School of Electrical and Mechanical Engineering (Engineering Training Centre), XuChang University, Xuchang, China*

FPA-11. **Multi-Objective Tradeoff Designs of Rotor Flux-Barrier in a Multi-Layered IPM Machines for EV Applications.** *Y. Hu*[1] and S. Zhu[1] *1. Nanjing Engineering Institute of Aircraft Systems, Nanjing, China*

FPA-12. **Withdrawn**

FPA-13. **Multiphysics modeling and optimization of PMSM for high speed operation.** *T.A. Marcand*[1], C. Bonnard[1], S. Mezani[1] and N. Takorabet[1] *1. Laboratoire GREEN, Université de Lorraine, Nancy, France*

FPA-14. **Design and Analysis of Axial Flux Permanent Magnet Motor with Halbach Magnet Array Dual Rotor Based on Three-Dimensional Analytical Approach.** *M. Koo*[1], H. Shin[1], K. Lee[1] and S. Lee[1] *1. Automotive Materials & Components R&D Group, Korea Institute of Industrial Technology, Gwangju, The Republic of Korea*

FPA-15. **Investigation of Electromagnetic Formulations for Efficient Analysis of MFTs.** *S. Pourkeivannour*[1], M. Curti[1] and E. Lomonova[1] *1. Department of Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

FPA-16. **Development of a Machine Learning-based Design Platform for Permanent-Magnet Synchronous Motor Toward Simulation Free.** *L. Lin*[1] and M. Hsieh[1] *1. National Cheng Kung University, Tainan, Taiwan*

FPA-17. **Comparative Study of Superconducting Machines according to Shielding and Electromagnetic Structures based on Analytical Method.** *K. Shin*[1], J. Lee[1], J. Choi[2], S. Sung[3] and H. Cho[2] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea; 3. Korea Research Institute of Science and Ocean Engineering, Daejeon, The Republic of Korea*

Session GOA
PERMANENT MAGNET MACHINES I

Narayan Kar, Chair
University of Windsor, Windsor, ON, Canada

GOA-01. **Axial Force Negative Stiffness in Axial-Flux Electric Machines.** ***(Invited)*** *W. Soong*[1], E. Roshandel[2], Z. Cao[2], A. Mahmoudi[2] and S. Kahourzade[3] *1. School of Electrical and Mechanical Engineering, University of Adelaide, Adelaide, SA, Australia; 2. College of Science & Engineering, Flinders University, Adelaide, SA, Australia; 3. STEM, University of South Australia, Adelaide, SA, Australia*

GOA-02. **An Inductance Testing Method of Dual Three-Phase Permanent Magnet Synchronous Machines Using Equivalent Electromagnetic Field Analysis.** *D. Zeng*[1], Q. Zhang[1], J. Zou[2], Y. Xu[2] and H. Pan[1] *1. Harbin Engineering University, Harbin, China; 2. Harbin Institute of Technology, Harbin, China*

GOA-03. **Study on Injection Molding IPMSM Using Sm-Fe-N Bonded Magnet.** *Y. Yoshida*[1], R. Yoshida[2], M. Abe[2], K. Takeda[1], S. Tada[2], M. Yamamoto[2] and K. Tajima[1] *1. Graduate School of Engineering Science, Akita University, Akita, Japan; 2. Magnet Manufacturing Dept. Functional Materials Business Unit, Nichia corporation, Akita, Japan*

GOA-04. **Effect of Reaction Field Caused by Eddy Currents and Hysteresis Phenomenon in Laminated Cores on Torque Characteristics of Interior Permanent Magnet Synchronous Motors.** *K. Yamazaki*[1] and Y. Nakatani[1] *1. Electrical and Electric Engineering, Chiba Institute of Technology, Narashino, Japan*

GOA-05. **Complex shaped magnets for an efficient use of rare earths in synchro-reluctant machines.** B. Chareyron[2], A. Nasr[2], O. Guyon[2], S. Desrousseaux[1] and *G. Delette*[1] *1. DTNM, CEA-LITEN, Grenoble, France; 2. IFPEN, Rueil-Malmaison, France*

Session GPA
PERMANENT MAGNET MACHINES II (Poster Session)

Yukihiro Yoshida, Chair
Akita University, Akita, Japan

GPA-01. **Analysis and Monitoring Method for Inter-Turn Short Circuit Fault for PMSM.** *C. Liu*[1], J. Zou[1], Y. Xu[1] and S. Li[1] *1. Harbin Institute of Technology, Harbin, China*

GPA-02. **Investigation of Fault-Tolerant Performance and Inductance in a Modular Permanent Magnet In-Wheel Motor.** Y. Tang[1], F. Chai[2], *Y. Xie*[1] and W. Cai[1] *1. Electrical Engineering, Harbin University of Science and Technology, Harbin, China; 2. Electrical Engineering, Harbin Institute of Technology, Harbin, China*

GPA-03. **A Novel Rotor-Step Skewing Method for Vibration Mitigation in Interior Permanent Magnet Synchronous Motor.** D. Li[1], *Y. Xie*[1], F. Liu[1], W. Cai[1] and F. Yang[1] *1. Harbin University of Science and Technology, Harbin, China*

GPA-04. **A Novel Fault Tolerant Structure of Open Circuit Fault in Arc Linear Flux Switching Permanent Magnet Motors Based on Redundant Winding.** *F. Liu*[1], Y. Xie[1] and W. Cai[1] *1. Harbin University of Science and Technology, Harbin, China*

GPA-05. **Magnetic Property Investigation of High-Tension Electrical Steel Sheet Applied to Interior Permanent Magnet Synchronous Motors Considering Multiaxial Stress Caused by Centrifugal Force.** *K. Yamazaki*[1], K. Ishikawa[1], H. Ohguchi[2], S. Imamori[3] and M. Shuto[3] *1. Chiba Institute of Technology, Narashino, Japan; 2. Electrical and Electric Engineering, Tokai University, Hiratsuka, Japan; 3. Fuji Electric Co., Ltd., Hino, Japan*

GPA-06. **Optimal Design of Outer Rotor Permanent Magnet Synchronous Motor Considering Electromagnetic Loss and Torque Characteristics.** *H. Kim*[1], J. Kang[1], J. Kim[1], J. Lee[1] and S. Won[2] *1. Hanyang university, Seoul, The Republic of Korea; 2. Dongyang Mirae University, Seoul, The Republic of Korea*

GPA-07. **A Novel Partitioned-Stator Flux Reversal Machine with Two Sets of Permanent Magnet.** *K. Yang*[1], F. Zhao[1], J. Yu[1] and Y. Wang[1] *1. Harbin Institute of Technology (Shenzhen), Shenzhen, China*

GPA-08. **Analytical Calculation and Low-Order Component Optimization of Axial Electromagnetic Force for an Axial Flux Motor.** *F. Zhao*[1], Z. Shao[1] and H. Fan[2] *1. Harbin Institute of Technology (Shenzhen), Shenzhen, China; 2. Shenzhen MSU-BIT University, Shenzhen, China*

GPA-09. **Design Optimization Using Asymmetric Rotor in IPMSM for Torque Ripple Reduction Considering Forward and Reverse Directions.** J. Park[1,2], *J. Kim*[1], S. Park[1,3], K. Kim[1], M. Sung[4] and M. Lim[1] *1. Department of Automotive Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Robot Business Team, Samsung Electronics Co., Ltd, Suwan-si, The Republic of Korea; 3. R&D Division, Hyundai Motor Company, Hwaseong-si, The Republic of Korea; 4. Department of Automotive Engineering (Automotive-Computer Convergence), Hanyang University, Seoul, The Republic of Korea*

GPA-10. **Comparative Study of Mechanical and Electrical Characteristics on High-Strength Steel and Conventional Steel for EV Traction High-Speed Multilayer IPMSM Using Rare-Earth Free PM.** *K. Kim*[1], Y. Jung[3], J. Park[2,1] and M. Lim[1] *1. Hanyang University, Seoul, The Republic of Korea; 2. Samsung Electronics, Suwan, The Republic of Korea; 3. Hyundai Motor Company, Hwaseong, The Republic of Korea*

GPA-11. **Effects of High-Pressure Environment on Deep-sea Fe-Co-V Alloys Permanent Magnet Synchronous Motors.** G. Yu[1], *J. Huang*[1], Y. Xu[1], L. Xiao[1] and J. Zou[1] *1. Harbin Institute of Technology, Harbin, China*

GPA-12. **A Study on Radial Magnetic Bearing of a New Stator Shape for High Manufacturability and Reduction of and Weight.** S. Song[1], S. Lee[2], W. Kim[2], J. Lee[1] and *D. Jung*[3] *1. Hanyang University, Seoul, The Republic of Korea; 2. Gachon University, Seong-Nam, The Republic of Korea; 3. Halla University, Wonju, The Republic of Korea*

GPA-13. **A Novel Flux Concentrated Stator Consequent-Pole Permanent Magnet Machine with Non-Uniform Stator Modulation Teeth.** *Y. Li*[1], Q. Zhou[1], S. Ding[1], J. Hang[1] and W. Li[1] *1. School of Electrical Engineering and Automation, Anhui University, Hefei, China*

GPA-14. **Space Vector Pulse Width Modulation for a Five-Leg Inverter to Control a Dual Three-Phase Electric Machine.** *W. Wang*[1,2], Y. Chen[1,2], Y. Liu[1,2], R. Huang[1,2], B. Zhang[1,2], F. Yu[1,3] and C. Liu[1,2] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong SAR, China; 2. Shenzhen Research Institute, City University of Hong Kong, Shenzhen, China; 3. School of Electrical Engineering, Nantong University, Nantong, China*

GPA-15. **A Novel Six-Phase Out Rotor Transverse Flux Reversal PM Motor for Aviation Propulsion System.** *B. Zhang*[1,2], K. Feng[1,2], W. Wang[1,2], H. Wen[1,2], Y. Chen[1,2], T. Wang[1,2] and C. Liu[1,2] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong; 2. City University of Hong Kong Shenzhen Research Institute, Shen Zhen, China*

GPA-16. **A Low-Cost Segment Method to Reduce PM Eddy-Current Loss in Axial Flux PM Wheel Motor.** *C. Wang*[1], Y. Liu[2], J. Huang[2] and Z. Zhang[3] *1. School of Electrical Engineering, Anhui Polytechnic University, Wuhu, China; 2. Anhui Polytechnic University, Wuhu, China; 3. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

GPA-17. **A Novel Winding Connection Sequence of Dual Three-Phase Series-End Winding PMSM Drive for Speed Range Extension.** *Z. Dong*[1,2], Y. Liu[1,2], H. Wen[1,2], K. Feng[1,2], F. Yu[1,3] and C. Liu[1,2] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong; 2. Shenzhen Research Institute, City University of Hong Kong, Shenzhen, China; 3. School of Electrical Engineering, Nantong University, Nantong, China*

GPA-18. **The Analytical Calculation and Measurements of the Magnetic Force Between Permanent Magnet and Rotor Yoke of a Large-Scale Permanent Magnet Synchronous Generator.** *H. Shin*[1], M. Lim[2] and J. Choi[1] *1. Chung Nam National University, Daejeon, The Republic of Korea; 2. Unison, Daejeon, The Republic of Korea*

POSTER SESSION

Session GPB
PERMANENT MAGNET MACHINES III (Poster Session)

Narayan Kar, Co-Chair
University of Windsor, Windsor, ON, Canada
Reza Nasirizarandi, Co-Chair
University of Windsor, Windsor, ON, Canada

GPB-01. **The Influence of Segmented Modular Stator on the Efficiency of Permanent Magnet Synchronous Motor.** *J. Lee*[1], J. Choi[2], S. Sung[3], H. Cho[2] and K. Shin[1] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea; 3. Korea Research Institute of Science and Ocean Engineering, Daejeon, The Republic of Korea*

GPB-02. **Dynamic Magnetic Network Modeling and Electromagnetic Analysis of an External Rotor PMSM for Electric Hub System.** L. Wang[1], *F. Shen*[1], F. Marignetti[2], Q. Li[1] and N. Bianchi[3] *1. Department of Electrical and Electronic Engineering, Harbin University of Science and Technology, Harbin, China; 2. University of Cassino and South Lazio, Cassino, Italy; 3. Department of Industrial Engineering, University of Padova, Padova, Italy*

GPB-03. **A Study on the Shape of Axial Flux Motor for Collaborative Robot Joints to Improve Output.** J. Min[1], *H. Pyo*[1], N. Kang[1], M. Youn[1] and W. Kim[1] *1. Department of Electrical Engineering, Gachon University, Seongnam, The Republic of Korea*

GPB-04. **A study on Performance Improvement of Axial Flux Motor through Halbach Array and Same Direction Skew.** *M. Hong*[1], W. Kim[1], H. Pyo[1], N. Jo[1] and D. Jung[2] *1. Electrical Engineering, Gachon University, Seongnam-Si, The Republic of Korea; 2. Halla Univerisity, Seongnam-Si, The Republic of Korea*

GPB-05. **Experimental Verification and Characteristics Analysis of Permanent Magnet Synchronous Generator using Semi-Analytical Method.** *H. Lee*[1], J. Woo[1], K. Shin[2], K. Kim[3], J. Park[3] and J. Choi[1] *1. Chung Nam National University, Daejeon, The Republic of Korea; 2. Chonnam National University, Yeosu, The Republic of Korea; 3. Korea Research Institute of Ships and Ocean Engineering, Daejeon, The Republic of Korea*

GPB-06. **Torque Ripple Suppression Under Open-Circuit Fault for DTPPMSM Considering Phase Back EMF Harmonics.** *C. Liu*[1], J. Zou[1], Y. Xu[1] and Z. Liu[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

GPB-07. **Computationally Efficient Estimation of PWM-induced Iron Loss of PMSM using Deep Transfer Learning.** S. Park[1,2], *K. Kim*[2] and M. Lim[2] *1. R&D Division, Hyundai Motor Company, Hwaseong, The Republic of Korea; 2. Department of Automotive Engineering, Hanyang University, Seoul, The Republic of Korea*

GPB-08. **Comparative Study of Various Slot Pitch for 2-Pole 6-Slot Ultra-High Speed Permanent Magnet Synchronous Motor.** *J. Kim*[1], S. Im[1], S. An[1], K. Cha[1] and M. Lim[1] *1. Automotive Engineering, Hanyang University, Seoul, The Republic of Korea*

GPB-09. **Transfer Learning-Based Design Method for Cogging Torque Reduction in PMSMs with Step-Skew considering 3-D Leakage Flux.** *Y. Won*[1], J. Kim[1], S. Park[1], J. Lee[1], S. An[1] and M. Lim[1] *1. Hanyang University, Seoul, The Republic of Korea*

GPB-10. **Design of a Novel Double-Stator Transverse Flux Reversal Permanent Magnet Machine.** B. Zhang[1,2], *R. Huang*[1,2], Z. Song[3], S. Liu[1,2], Z. Dong[1,2], Y. Liu[1,2] and C. Liu[1,2] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong; 2. City University of Hong Kong Shenzhen Research Institute, Shen Zhen, China; 3. Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

GPB-11. **Research and Analysis of Toroidal and Conventional Windings in Permanent Magnet Synchronous Machine.** *X. Liang*[1], M. Wang[1], P. Zheng[1], J. Gao[1] and W. Li[1] *1. Harbin Institute of Technology, Harbin, China*

GPB-12. **Harmonic Component Analysis of Radial and Tangential Electromagnetic Force of Permanent Magnet Synchronous Motor.** J. Zou[1], *M. Liu*[1], Y. Xu[1], H. Lan[2] and G. Yu[1] *1. Harbin Institute of Technology, Harbin City, China; 2. Huawei Technologies Co., Ltd., Shenzhen City, China*

GPB-13. **A Study on the Shape of a Small Wind Turbine with Fractional Slot Concentrated Winding to Realize Zero Cogging Level.** *J. Kang*[1], J. Kim[1], D. Jung[2], K. Kim[2], C. Kim[3] and J. Lee[1] *1. Hanyang University, Seoul, The Republic of Korea; 2. Halla University, Wonju, The Republic of Korea; 3. Kangnam University, Yong-in, The Republic of Korea*

GPB-14. **Study on the Offline Inter-turn Fault Diagnosis Performance According to the Parameter of Interior Permanent Magnet Synchronous Motor.** *H. Kim*[1], J. Kang[1], J. Kim[1], S. Won[2] and J. Lee[1] *1. Hanyang University, Seoul, The Republic of Korea; 2. Dongyang Mirae University, Seoul, The Republic of Korea*

GPB-15. **Hybrid Rotor Multiple Magnet Design for Electric Vehicles.** *C.I. Nlebedim*[1] and A. Baghel[1] *1. Critical Materials Institute, Ames Laboratory, US Department of Energy, Ames, IA, United States*

GPB-16. **Study on the Electromagnetic Force and Vibration Noise of Different Current Harmonics on Generator Shell with Amorphous Alloy.** *C. Hsu*[1] *1. Department of Mechanical Engineering, Asia Eastern University of Science and Technology, New Taipei City, Taiwan*

GPB-17. **A Study on the 2D Demagnetization Analysis Error Caused by the 3D End Effect in an Interior Permanent Magnet Synchronous Motor.** *S. Lee*[1] and J. Bae[2] *1. Electrical Engineering, Dong-A University, Busan, The Republic of Korea; 2. Electrical Engineering, Dongyang University, Seoul, The Republic of Korea*

Session HOA
MAGNETICALLY GEARED AND VERNIER MACHINES I

Jonathan Bird, Co-Chair
Portland State University, Portland, OR, United States
Udochukwu Akuru, Co-Chair
Tshwane University of Technology, Pretoria, South Africa

HOA-01. **Enhanced Assemblability and Maximum Transmission Torque of Interior Permanent Magnet Magnetic-Geared Motor.** *J. Okamoto*[1,2], N. Niguchi[2], H. Kometani[1], H. Suzuki[1], K. Okazaki[1] and K. Hirata[2] *1. Mitsubishi Electric Corporation, Amagasaki, Japan; 2. Osaka University, Suita, Japan*

HOA-02. **A Novel Magnetic-Geared Motor Combining Magnetic Gear and SR Motor.** *K. Iwaki*[1], K. Ito[1] and K. Nakamura[1] *1. Tohoku University, Sendai, Japan*

HOA-03. **Investigation of Maximum Torque of Interior Permanent Magnet Type Magnetic-Geared Generator Based on Magnetic Interaction.** *B. Dai*[1], K. Ito[1] and K. Nakamura[1] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan*

HOA-04. **Investigation on Inclination Angle of Inserted Permanent Magnets in Double-Stator Vernier Machines.** *Z. Cai*[1], J. Yu[1], K. Yang[1], W. Mi[1], Z. Song[2] and Y. Luo[3] *1. School of Mechanical Engineering and Automation, Harbin Institute of Technology (Shenzhen), Shenzhen, China; 2. Department of Industrial and Systems Engineering, the Hong Kong Polytechnic University, Hong Kong SAR, China; 3. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*

HOA-05. **An Integrated Axial-Flux Magnetic-Geared Double-Rotor Machine using Harmonic Current Injection Method for HEVs.** *J. Lang*[1], C. Tong[1], J. Bai[1], J. Liu[1], G. Liu[1] and P. Zheng[1] *1. Electrical Engineering, Harbin Institute of Technology, Harbin, China*

HOA-06. **Design and Analysis of a Novel Double-Stator Hybrid Flux Machine for Direct-Drive Electric Traction.** *Z. Song*[1], B. Zhang[2], W. Wang[2], Y. Liu[2] and D. Xiao[3] *1. Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong; 2. School of Energy and Environment, City University of Hong Kong, Kowloon, Hong Kong; 3. Sustainable Energy and Environment Thrust, The Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China*

HOA-07. **Development of Ultra High Speed Magnetic Gear.** *E. Asahina*[1], K. Mitsuya[1], K. Nakamura[1], Y. Tachiya[2], Y. Suzuki[2] and K. Kuritani[2] *1. Tohoku University, Sendai, Japan; 2. Prospine Co., Ltd., Osaki, Japan*

HOA-08. **Experimental Verification of Increasing Torque Density by Magnetic Interaction in 500 Nm Class IPM-Type Magnetic-Geared Motor.** *K. Iwaki*[1], K. Ito[1] and K. Nakamura[1] *1. Tohoku University, Sendai, Japan*

POSTER SESSION

Session HPA
MAGNETICALLY GEARED AND VERNIER MACHINES II
(Poster Session)

Abdelmounaim Tounzi, Co-Chair
Univ. Lille, Arts et Metiers Institute of Technology, Villeneuve d'Ascq, France

Makoto Ito, Co-Chair
Hitachi, Ltd., Ibaraki, Japan

HPA-01. **Improvement of Transmission Torque Characteristics of Strain Wave Gear with Magnets.** *F. Kitayama*[1], R. Kondo[1] and R. Endo[1] *1. Graduate School of Science and Engineering, Ibaraki University, Hitchi-city, Japan*

HPA-02. **Design of 20-MW Direct-Drive PM Vernier Generator with Minimal Volume.** *A. Rehman*[1], J. Lee[1], Y. Kim[1] and B. Kim[1] *1. Electrical Engineering, Kunsan National University, Gunsan, The Republic of Korea*

HPA-03. **Design and Analysis of High-Torque-Density Consequent-Pole Permanent Magnet Vernier Motor with Even-Order Harmonics Cancellation.** *C. Chang*[1] and M. Hsieh[1] *1. National Cheng Kung University, Tainan, Taiwan*

HPA-04. **Effects of the Rotor Mechanical Offset Angle on the Electromagnetic Performance of Dual Stator Wound-Field Flux Switching Machines.** *U.B. Akuru*[1], W. Ullah[2], F. Khan[2] and L. Masisi[3] *1. Department of Electrical Engineering, Tshwane University of Technology, Pretoria, South Africa; 2. Department of Electrical and Computer Engineering, COMSATS University Islamabad, Abbottabad, Pakistan; 3. School of Electrical and Information Engineering, University of the Witwatersrand, Johannesburg, South Africa*

HPA-05. **Prediction of Stress and Deformation Caused by Magnetic Attraction Force in Modulation Elements in A Magnetically Geared Machine Using Mathematical Modeling.** *M. Nguyen*[1], J. Lee[3], H. Shin[1], Y. Lee[1], H. Lee[1], K. Shin[2], A. Phung[4] and J. Choi[1] *1. Chung Nam National University, Daejeon, The Republic of Korea; 2. Chonnam National University, Yeosu, The Republic of Korea; 3. Hyundai Transys, Hwaseong, The Republic of Korea; 4. Hanoi University of Science and Technology, Hanoi, Vietnam*

HPA-06. **Analysis of Loss Characteristics of a Double Stator Magnetic Gear Motor Based on Thin Non-Oriented Electrical Steel.** *D. Li*[1], Y. Li[1], X. Zhang[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang City, China*

HPA-07. **A Novel S-Shape Offset Type of a Modulated Ferromagnetic Pole Piece Design for a Pseudo Direct Drive Motor.** *P. Huang*[1], T. Chang[1], W. Yang[1], Y. Wu[2] and M. Tsai[3] *1. Electric Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Department of Mechanical Engineering, National Yunlin University of Science and Technology, Yunlin, Taiwan; 3. Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan*

HPA-08. **Robust Optimization and Design of Double-Stator Vernier Permanent Magnet Motors Considering Motor Punching Process.** *D. Fan*[1], W. Shan[1], X. Zhu[1] and Z. Xiang[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

HPA-09. **Dynamic Performance Analysis of The Variable Speed Ratio Magnetic Gear.** *Y. Xiao*[1], M. Lu[1] and X. Liu[1] *1. College of Electrical and Information Engineering, Hunan University, Changsha 410082, China*

HPA-10. **Comparison of Permanent Magnet Vernier Motors with Evenly and Unevenly Distributed Modulation Teeth.** *Z. He*[1], F. Xiao[1], Y. Du[1] and X. Zhu[1] *1. Jiangsu University, Zhenjiang, China*

HPA-11. **Design and Analysis of Magnetic Geared Permanent Magnet Machine to Improve Electromagnetic Performance.** *J. Lee*[1], S. Sung[2], J. Choi[3] and K. Shin[1] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Korea Research Institute of Science and Ocean Engineering, Daejeon, The Republic of Korea; 3. Chungnam National University, Daejeon, The Republic of Korea*

HPA-12. **Design and Experimental Verification Considering the Electromagnetic-Mechanical Characteristics of a Coaxial Magnetic Gear for Permanent Magnet Wind Turbine.** J. Lee[1], K. Shin[2], *H. Lee*[3], Y. Lee[3], J. Woo[3] and J. Choi[3] *1. Hyundai Transys, Hwaseong-si, The Republic of Korea; 2. Chonnam National University, Yeosu, The Republic of Korea; 3. Chung Nam National University, Daejeon, The Republic of Korea*

HPA-13. **Additional Magneto Motive Force of Spoke-Type Vernier Permanent-Magnet Machines.** *Y. Liu*[1], B. Song[1] and X. Tang[1] *1. Huazhong University of Science and Technology, Wuhan, China*

HPA-14. **Analytical Modeling of a Spoke-type Double-stator Vernier Machine.** H. Zhao[1,2] and *J. Yu*[3] *1. Robotics and Autonomous Systems, The Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China; 2. Department of Electronic & Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong, China; 3. School of Mechanical Engineering and Automation, Harbin Institute of Technology (Shenzhen), Shenzhen, China*

HPA-15. **Design and Analysis of Magnetic Gear-Axial Flux Generator for Wave Power Generation Based on Halbach Magnetic Circuit.** *Y. Li*[1], L. Huang[1], M. Chen[1] and M. Hu[1] *1. Department of Electrical Engineering, Southeast University, Nanjing, China*

HPA-16. **Research on Linear-rotary Wave Energy Conversion with Axial Flux Modulation Generator.** *L. Huang*[1], Y. Li[1], Y. Li[1], M. Hu[2] and L. Wei[1] *1. Southeast University, Nanjing, China; 2. Nanjing Normal University, Nanjing, China*

HPA-17. **Quantitative Analysis and Comparison of In-Wheel Outer Rotor Consequent-Pole Flux-Switching Permanent Magnet Machines with Different Magnet Arrangements.** *Y. Bi*[1], W. Fu[2] and S. Niu[1] *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong; 2. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China*

HPA-18. **Design and Analysis of Multiport Field Modulated Axial Flux Generator for Wave Power Generation.** *Y. Li*[1], L. Huang[1], M. Chen[1] and M. Hu[1] *1. Southeast University, Nanjing, China*

HPA-19. **High Torque Density Toroidal Winding Permanent Magnet Vernier Machine with Dual Rotor.** *B. Wang*[1], R. Wang[1], M. Cheng[1] and Z. Wang[1] *1. Southeast University, Nanjing, China*

HPA-20. **Influence of Electrical Steel Sheets Cutting on Dual-Winding Dual-Flux-Concentrated Magnetic-Field-Modulated Brushless Compound-Structure Machine.** *G. Liu*[1], P. Zheng[1], J. Bai[1], Y. Wang[1] and X. Liang[1] *1. School of Electrical Engineering & Automation, Harbin Institute of Technology, Harbin, China*

Session IOA
SPECIAL MACHINES I

Cheng-Tsung Liu, Chair
National Sun Yat-Sen University, Kaohsuing, Taiwan

IOA-01. **Effects of the Partial Non-Magnetic Improvement Length and Position in the Bridge on the Flux of a Rotor Core for Obtaining a High Magnetic Flux.** *N. Hamada*[1,2], A. Watarai[1], H. Mitarai[1,2], K. Oikawa[2] and S. Sugimoto[2] *1. Aichi Steel Corporation, Tokai, Japan; 2. Tohoku University, Sendai, Japan*

IOA-02. **Impact of Series and Parallel teeth on Performance of Counter Rotating Dual Rotor Permanent Magnet Flux Switching Machines.** W. Ullah[1], F. Khan[1] and *U.B. Akuru*[2] *1. Electrical and Computer Engineering, COMSATS Institute of Information Technology, Abbottabad, Pakistan; 2. Department of Electrical Engineering, Tshwane University of Technology, Pretoria Campus, South Africa*

IOA-03. **Analysis of Three-Degree-of-Freedom Spherical Actuator Driven by Four-Phase.** *Y. Tamaki*[1], A. Heya[1] and T. Inoue[1] *1. Department of Mechanical Systems Engineering, Nagoya University, Nagoya City, Japan*

IOA-04. **Dual-Axial Gap High-Speed Induction Motor using Wound Ultra-thin Laminated 3.5%Si-Steel Strip Core.** *M. Enokizono*[2], D. Wakabayashi[1], M. Oka[1], N. Soda[3], M. Takai[4], T. Kajiya[4], K. Okamoto[6], K. Harmeyer[5] and M. Nell[5] *1. Mechanical Electric Engineering, Nippom Bunri University, Oita, Japan; 2. Vector Magnetic Characteristic Technical Laboratory, Usa, Japan; 3. Electrical Engineering, Ibaragi University, Hitachi, Japan; 4. Nippon Kinzoku Co, Ltd, Tokyo, Japan; 5. Institute of Electrical Machines, RWTH Aachen University, Aschen, Germany; 6. Tokuden, Co., Kyoto, Japan*

IOA-05. **Analysis of Operation Characteristics for a Novel Axial Field Hybrid Excitation Synchronous Generator.** *J. Yu*[1], S. Zhu[1] and C. Liu[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

IOA-06. **Enhanced Tunneling Performance of Magnetic Helical Robots Utilizing Pecking Motion Generated by Alternating Rotating Magnetic Field.** *J. Kwon*[1], J. Sa[1], D. Lee[1] and G. Jang[1] *1. Hanyang University, Seoul, The Republic of Korea*

IOA-07. **A Novel High-Performance Flux Reversal Motor with Cross-Pole Shape Stator.** *Y. Yu*[1] and K. Nakamura[1] *1. Tohoku University, Sendai, Japan*

IOA-08. **Influence of air gaps between grain-oriented steel sheets on losses in the magnetic system.** *A. Giraud*[1], Y. Serdyuk[1] and T. Thiringer[1] *1. Chalmers University of Technology, Gothenburg, Sweden*

IOA-09. **Dynamic Modeling of Two-Coil Two-Degree-of-Freedom Voice Coil Actuator.** *Y. Ohashi*[1], A. Heya[1] and T. Inoue[1] *1. Mechanical Systems Engineering, Nagoya University, Nagoya, Japan*

IOA-10. **Analytical Approach for the Optimal Design of Line Start Permanent Magnet Synchronous Motor (LSPMSM).** *H. Farooq*[1], N. Bracikowski[2], P. La Delfa[3] and M. Hecquet[1] *1. Centrale Lille, Lille, France; 2. University of Nantes, Nantes, France; 3. University of Lille, Lille, France*

IOA-11. **Bearingless Doubly Salient Electromagnetic Motor with Combined Suspension Winding for Reduction of Suspension Force Cross-Coupling.** *L. Yu*[1], Q. Xu[1], W. Chen[1] and Z. Zhang[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

IOA-12. **Axial Flux Switched Reluctance Machine Modelling by a Quasi-3D Reluctance Network.** *M. Hatoum*[1], S. Asfirane[1], G. Barakat[1] and Y. Amara[1] *1. Université Le Havre Normandie, Le Havre, France*

ORAL SESSIONS

Session IOB
SPECIAL MACHINES II

Lei Xu, Chair
Jiangsu University, Zhenjiang, China

IOB-01. **Automatic MTPA Control Method for Magnetic-Geared Motor Using Sensorless Control Based on Extended Electromotive Force Model.** *N. Niguchi*[1], K. Hirata[1] and J. Okamoto[1] *1. Osaka University, Suita, Japan*

IOB-02. **Design and Comparative Analysis of Dual Rotor Wound Field Excited Flux Switching Generator for Wind Turbine Applications.** W. Ullah[1], F. Khan[1], A. Selema[1] and *U.B. Akuru*[2] *1. Department of Electromechanical, Systems and Metal Engineering, Ghent University, Ghent, Belgium; 2. Department of Electrical Engineering, Tshwane University of Technology, Pretoria Campus, South Africa*

IOB-03. **Design of a Novel Modular Flux Switching Permanent Magnet Resolver.** *W. Mi*[1], J. Yu[1], Z. Song[2], K. Yang[1], Z. Cai[1] and H. Zhao[3] *1. School of Mechanical Engineering and Automation, Harbin Institute of Technology (Shenzhen), Shenzhen, China; 2. Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hongkong SAR, China; 3. Robotics and Autonomous Systems Thrust, The Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China*

IOB-04. **Design and Analysis of a Six-Phase Axial Switched-Flux Permanent Magnet Machine with Different Winding Configuration.** *J. Zhao*[1], Z. Lu[1], Q. Han[1], L. Wang[1] and L. Wang[1] *1. School of Electrical Engineering, Xi'an University of Technology, Xi'an, China*

IOB-05. **Surrogate-Based Modeling of Induction Machines to Reduce the Computational Burden of Robust Multi-Objective Optimization.** *O. Taqavi*[1], A. Fatima[1], A.J. Bourgault[1], Z. Li[1], G. Byczynski[2], J. Tjong[1] and N. Kar[1] *1. Electrical and Computer Engineering, University of Windsor, Windsor, ON, Canada; 2. Nemak, Windsor, ON, Canada*

IOB-06. **Winding Magnetization Design of Single-Phase Capacitor-Run Induction Motor for Submersive Pump Application.** *C. Liu*[1], H. Chen[1], P. Wu[1] and P. Chao[1] *1. Department of Electrical Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan*

IOB-07. **Multi-Mode Excitation Analysis and Design of a New Hybrid Excited Modular Stator Permanent Magnet Switched Reluctance Machine.** *L. Xu*[1], D. Xu[1], X. Zhu[1], C. Zhang[1] and X. zang[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

IOB-08. **Parameter Identification for Large Synchronous Machine Using Standstill Time Response Test in Arbitrary Position.** *Y. Ma*[1], R. He[1], Z. Li[1] and D. Chen[1] *1. CSG Power Generation Co. Ltd., Guangzhou, China*

IOB-09. **Nonlinear Force Model of a Double-Sided Linear Switched Reluctance Motor Using Intelligent Optimization Method.** S. Huang[1], *P. He*[1] and G. Cao[1] *1. Guangdong Key Laboratory of Electromagnetic Control and Intelligent Robots, Shenzhen University, Shenzhen, China*

IOB-10. **Four-Axes Controlled Superconducting Magnetic Levitation System Using Persistent Current.** *M. Komori*[1], K. Murakami[1], K. Nemoto[2] and K. Asami[1] *1. Electrical and Electronic Engineering, Kyushu Institute of Technology, Kitakyushu, Japan; 2. Superconducting Division, Furukawa Electric Co., Chiyoda, Japan*

IOB-11. **Design Optimization of a Six-Degrees-of-Freedom Magnetically Levitated Planar Motor Using Response Surface Methodology.** *Y. Gan*[1], S. Huang[1] and G. Cao[1] *1. Guangdong Key Laboratory of Electromagnetic Control and Intelligent Robots, Shenzhen University, Shenzhen, China*

IOB-12. **Analysis of Efficiency Maps of Synchronous Machines.** H. Diab[1], S. Asfirane[1] and *Y. Amara*[1] *1. University of Le Havre, Le Havre, France*

POSTER SESSION

Session IPA
SPECIAL MACHINES III
(Poster Session)

Shuangxia Niu, Chair
The Hong Kong Polytechnic University, Kowloon, Hong Kong

IPA-01. **Magnetic Properties of Wound Laminated Cores for a Dual-Axial Gap Induction Motor under PWM Excitation.** *M. Oka*[1], M. Enokizono[2], D. Wakabayashi[1], H. Kiyotake[3], N. Soda[4], M. Takai[5] and T. Kajiya[5] *1. Mechanical and Electrical Engineering, Nippon Bunri University, Oita, Japan; 2. Vector Magnetic Characteristic Technical Laboratory, Oita, Japan; 3. Department of Electrical and Electronic Engineering, National Institute of Technology, Oita College, Oita, Japan; 4. Department of Electrical and Electronic Engineering, Ibaraki University, Hitachi, Japan; 5. Nippon Kinzoku Co. Ltd., Itabashi-ku, Japan*

IPA-02. **A Novel Speed-Sensorless Wireless Universal Motor with Bidirectional Movement.** H. Wang[1], *K. Chau*[1], W. Liu[1] and S. Goetz[2] *1. The University of Hong Kong, Hong Kong; 2. Duke University, Durham, NC, United States*

IPA-03. **Research on a Transverse-Dislocated Magnetic-Field Modulated Brushless Contra-Rotating Machine Adopting Different Core Material Combinations.** *Y. Wang*[1], Y. Sui[1], G. Liu[1], X. Liang[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

IPA-04. **A Brushless Hybrid Excited Motor based on Field Modulation Theory.** Y. Du[1], X. Wang[1], F. Xiao[1], *Z. He*[1] and X. Zhu[1] *1. Jiangsu University, Zhenjiang, China*

IPA-05. **Programmable Behaviors of Magnetic Microrobots under the Fluidic Flow.** *M. Park*[1] and J. Yoon[1] *1. School of Integrated Technology, Gwangju Institute of Science and Technology, Gwangju, The Republic of Korea*

IPA-06. **Magnetic Performance Analysis of Axial Magnetic Flux Motor Stator Considering Laminating Thermal Stress.** *X. Zhang*[1], J. Li[1], D. Li[1], J. Li[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang City, China*

IPA-07. **Research on Magnetic Properties of Iron Core Based on Fe-Co Alloys under Multi-field Coupling.** *J. Li*[1], S. Xu[1], L. Wang[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

IPA-08. **Sub-Harmonic Synchronous Machine Using a Dual Inverter and a Unique Three-Layer Stator Winding.** S. Rafin[1] and *O.A. Mohammed*[1] *1. Electrical and Computer Engineering, Florida International University, Miami, FL, United States*

IPA-09. **Comparison of Torque Generation Capabilities of the Axial-Field Switched Reluctance Machine with Segmented Rotor for Four Winding Configurations under Sine Wave and Unipolar Current.** *S. Asfirane*[1], G. Barakat[1], F. ChaBour[1] and Y. Amara[1] *1. GREAH, Université Le Havre Normandie, Le Havre, France*

IPA-10. **A Novel Consequent-Pole Contra-Rotating Machine with Zero-Sequence Current Excitation.** *M. Jiang*[1] and S. Niu[1] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

IPA-11. **A Novel PM-Assisted Compound-Excited Brushless DC Motor.** *M. Jiang*[1] and S. Niu[1] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

IPA-12. **A Built-In Integrated Magnetorheological Fluid Brake Permanent Magnet Synchronous Motor.** *Y. Hu*[1] and W. Xu[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

Session IPB
SPECIAL MACHINES AND RELUCTANCE MACHINES
(Poster Session)

Thanh Anh Huynh, Chair
National Cheng Kung University, Tainan, Taiwan

IPB-01. **Electromagnetic Design and Analysis of Low Speed High Torque Motor with Composite Rotor and Double Stator.** *S. Wang*[1], S. Jin[1], S. Yu[1] and Z. Zhang[1] *1. Shenyang University of Technology, Shenyang, China*

IPB-02. **Design and Performance Analysis of a New Synchronous Reluctance Machine with Hybrid Cores.** *S. Zhang*[1], C. Liu[1], G. Lei[2], Y. Wang[1] and J. Zhu[2] *1. Hebei University of Technology, Tianjin, China; 2. Sydney University of Science and Technology, Sydney, NSW, Australia*

IPB-03. **Design and Analysis of Wireless Stepper Motors Using Selective Wireless Power Transfer.** *S. Li*[1], K. Chau[1], W. Liu[1] and C. Liu[2] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong; 2. School of Energy and Environment, City University of Hong Kong, Hong Kong*

IPB-04. **Effective Performance Improvement Designs of a Hybrid Permanent-Magnet-Assisted Synchronous Reluctance Motor.** *C. Liu*[1], W. Chen[1], S. Yen[2], Y. Hsu[2], P. Shih[2] and T. Lo[2] *1. Department of Electrical Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan; 2. Research & Development Center, Nidec Taiwan Corporation, Tainan, Taiwan*

IPB-05. **Additive Manufacturing Axial Flux Variable Reluctance Resolve.** *T. Chang*[1], P. Huang[1], W. Huang[1], C. Huang[2], C. Mo[2] and M. Tsai[3] *1. Electric Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Department of Mechanical Engineering, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan; 3. Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan*

IPB-06. **Analysis and Comparison of Novel Yokeless Double Rotor Mutually Coupled Switched Reluctance Motor.** *D. Fu*[1], Z. Lv[1], H. Si[1], Y. Liu[1] and X. Wu[1] *1. School of Electrical Engineering, China University of Mining and Technology, Xuzhou, China*

IPB-07. **Novel Slot-Opening-PM Variable Reluctance Machine with High-Order-Harmonic Winding.** *F. Ni*[1], S. Niu[1], Z. Li[1] and X. Zhao[2] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong; 2. School of Physics, Engineering and Technology, The University of York, York, United Kingdom*

IPB-08. **A Novel High-Order-Harmonic Winding Design in Hybrid-Excited Reluctance Machine for Electric Vehicle Application.** *J. Jiang*[1] and S. Niu[1] *1. Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong*

IPB-09. **Analysis and Magnetic Field Calculation Method for Motor with Saliency.** *X. Liang*[1], M. Wang[1], P. Zheng[1], J. Gao[1] and W. Li[1] *1. Harbin Institute of Technology, Harbin, China*

IPB-10. **Analysis of Aluminum Eddy Current Effect for Planar Switched Reluctance Motors.** *J. Sun*[1], Z. He[1], G. Cao[2], S. Huang[2], J. He[3] and Q. Qian[1] *1. School of Electrical Engineering, Southwest Jiaotong University, Chengdu, China; 2. Shenzhen Key Laboratory of Electromagnetic Control, Shenzhen University, Shenzhen, China; 3. University of Kentucky, Lexington, KY, United States*

IPB-11. **Effect of cross-saturation on the performance of synchronous reluctance machine operating as autonomous generator.** *Y. Djouadi*[1] and A. Tounzi[1] *1. Université de Lille, Lille, France*

IPB-12. **Research on the Influence of Magnetic Barrier Distribution on the Magnetic Field of Synchronous Reluctance Machine.** P. Zheng[1], *X. Liang*[1], M. Wang[1], J. Gao[1] and W. Li[1] *1. Harbin Institute of Technology, Harbin, China*

ORAL SESSIONS

Session JOA
PERMANENT MAGNET MACHINES IV

Yacine Amara, Chair
Université Le Havre Normandie, Le Havre, France

JOA-01. **Evaluation of the Magneto-Elastic Effect on the High-Speed Capability of Rotors in Synchronous Machines with Buried Permanent Magnets.** *M. Lauerburg*[1], B. Schauerte[1] and K. Hameyer[1] *1. RWTH Aachen University, Institute of Electrical Machines (IEM), Aachen, Germany*

JOA-02. **Development of High Efficiency PMSG with Extremely Thin Stator Lamination Materials for Electric-Propulsion UAV.** *L. Li*[1,2], Z. Zhang[1,2], W. Bian[1,2], J. Li[1,2] and Y. Li[1,2] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China; 2. Center for More-Electric-Aircraft Power System College of Automation Engineering, Nanjing, China*

JOA-03. **Design Optimization of Rotor Bridge and Fixing Hole for Spoke-Type PMSM.** Y. Liu[1], *K. Ma*[1] and J. Xu[1] *1. College of Electrical and Automation Engineering, Nanjing Normal University, Nanjing, China*

JOA-04. **Heat magnetizing method for high-performance neodymium magnets for EV and HEV motors.** *M. Hori*[1], N. Tomita[1] and J. Hinata[2] *1. Nihon Denji Sokki Co., LTD., Tokyo, Japan; 2. Daido Steel Co., Ltd., Nakatsugawa-shi, Japan*

JOA-05. **Effect of Radial and Axial Magnet Segmentation on PM Eddy Current Losses for Brushless Synchronous Motors.** Y. Demir[1], M. Onsal[1] and *M. Aydin*[2] *1. MDS Motor, Kocaeli, Turkey; 2. Kocaeli University, Kocaeli, Turkey*

JOA-06. **Torque Pulsation Suppression of Permanent Magnet Machine Based on Pole-Pair Shift.** *L. Dai*[1], W. Zhang[2], J. Gao[1], C. Li[1] and S. Huang[1] *1. College of Electrical and Information Engineering, Hunan University, Changsha, China; 2. Changsha University, Changsha, China*

JOA-07. **Reduction of Iron Loss on Motor Stator Cores by means of Secondary Current Heating Method.** *Y. Tsuchida*[1] *1. Oita University, Oita, Japan*

JOA-08. **Impact of Soft Magnetic Material on Electromagnetic Force and Vibration of Permanent Magnet Electrical Machines.** *B. Li*[1], J. Zhu[2], C. Liu[1], G. Lei[3] and Y. Li[1] *1. Hebei University of Technology, Tianjin, China; 2. The University of Sydney, Sydney, NSW, Australia; 3. University of Technology Sydney, Sydney, NSW, Australia*

JOA-09. **Influence of Harmonic Magnet Field on Radial Force of Fractional-Slot PM Machines with Consideration of Slot/Pole Combinations.** *Y. Guo*[1], K. Wang[1] and H. Sun[2] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China; 2. Nanjing Forestry University, Nanjing, China*

JOA-10. **Study on Electromagnetic Vibration Characteristics in Fractional Slot Permanent Magnet Synchronous Motor.** *L. Bai*[1,2], W. Jiang[1,2] and L. Li[1,2] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China; 2. Center for More-Electric-Aircraft Power System College of Automation Engineering, Nanjing, China*

JOA-11. **Withdrawn**

JOA-12. **A Novel Double Stator Hybrid-Excited Flux Reversal Permanent Magnet Machine with Halbach PM Arrays.** S. Ning[1], P. Seangwong[1], *A. Siritaratiwat*[1] and P. Khunkitti[1] *1. Electrical Engineering, Khon Kaen University, Muang, Thailand*

JOA-13. **3D-printed Magnetic Iron Material Modeling for High Speed Actuators.** M. Pechlivanidou[1] and *A.G. Kladas*[1] *1. Electrical and Computer Engineering, National Technical University of Athens, Athens, Greece*

JOA-14. **Thermal Management with Heat Pipes for PMSM with Dual Rotor and Yokeless Stator for Electrified Aircraft Propulsion.** *Z. Wei*[1], Y. Liu[1], H. Xue[2], Z. Zhang[2] and C. Chen[1] *1. Nanjing Normal University, Nanjing, China; 2. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

Session JPA
PERMANENT MAGNET MACHINES V (Poster Session)

Daniele De Gaetano, Chair
The University of Sheffield, Sheffield, United Kingdom

JPA-01. **Analysis of A New Bidirectional Field Modulation Machine with Separated Type PM Excitation.** H. Wang[1], *Y. Zhang*[1], Y. Liu[1], C. He[1] and H. Zhu[1] *1. School of Electrical and Automation Engineering, Nanjing Normal University, Nanjing, China*

JPA-02. **Comparative Analysis of Dual-Stator Permanent Magnet Machines With Squirrel Stator Teeth Designed in Hypotenuse.** H. Wang[1], *Y. Xu*[1], Y. Liu[1], J. Yang[1] and D. Wang[2] *1. School of Electrical and Automation Engineering, Nanjing Normal University, Nanjing, China; 2. Jiangsu Maiji Yiwei Electric Technology Co., Ltd, Nanjing, China*

JPA-03. **Parameter Analysis and Multilevel Design Optimization of a Permanent Magnet Claw Pole Machine with Hybrid Cores.** *H. Zhang*[1], C. Liu[1], S. Zhang[1], G. Lei[2] and Y. Wang[1] *1. Hebei University of Technology, Tianjin, China; 2. Sydney University of Science and Technology, Sydney, NSW, Australia*

JPA-04. **Magnetic Properties Evaluation of a Compacted Soft Magnetic Composite Core for Permanent Magnet Claw Pole.** *H. Du*[1], C. Liu[1], S. Wu[1], S. Zhang[1] and Y. Wang[1] *1. Hebei University of Technology, Tianjin, China*

JPA-05. **Axis-Shifted Machines with Hybrid Rotors Considering Forward and Reverse Operations.** *S. Li*[1], C. Di[1] and X. Bao[1] *1. Hefei University of Technology, Hefei, China*

JPA-06. **Optimization of Halbach magnetic field applied response genetic algorithm.** L. Yin[1], Y. Wang[1], R. Sun[1], L. Wu[1] and *X. Xu*[2] *1. State Grid Lianyungang Power Supply Company, Lianyungang, China; 2. College of Automation, Nanjing University of Posts and Telecommunications, Nanjing, China*

JPA-07. **Loss reduction method under multi-operation points based on response surface algorithm.** L. Yin[1], Y. Wang[1], R. Sun[1], L. Wu[1] and *X. Xu*[2] *1. State Grid Lianyungang Power Supply Company, Lianyungang, China; 2. College of Automation, Nanjing University of Posts and Telecommunications, Nanjing, China*

JPA-08. **Design Optimization of an Interior Permanent Magnet Synchronous Machine with Asymmetric and Auxiliary Slot Structure.** *H. Zhang*[1], C. Liu[1], S. Zhang[1], G. Lei[2] and Y. Wang[1] *1. Hebei University of Technology, Tianjin, China; 2. Sydney University of Science and Technology, Sydney, NSW, Australia*

JPA-09. **Improvement Torque Ripple Characteristics of Dual-Winding Square Wave Brushless DC Motor with Phase Difference Drive.** *S. Noguchi*[1] *1. Aviation Technology Directorate, Japan Aerospace Exploration Agency (JAXA), Mitaka, Japan*

JPA-10. **Comparison Between Novel Pole-Changing and Conventional Flux Switching Permanent-Magnet Motors.** Y. Mao[1], F. Xiao[1], Y. Du[1], *Z. He*[1], X. Zhu[1] and L. Quan[1] *1. Jiangsu University, Zhenjiang, China*

JPA-11. **Rotor Position Estimation for PMSM Based on Hall Interval Angle Compensation and Phase-Tracking.** *K. Li*[1], J. Gao[1], L. Dai[1], S. Huang[1] and Y. Feng[1] *1. College of Electrical and Information Engineering, Hunan University, Changsha, China*

JPA-12. **Rotor Auxiliary Slot Design Optimization for Permanent Magnet Synchronous Motor with Double-Layer Rotor Structure for Electric Vehicle.** *H. Zhang*[1], C. Liu[1], S. Zhang[1], G. Lei[2] and Y. Wang[1] *1. Hebei University of Technology, Tianjin, China; 2. Sydney University of Science and Technology, Sydney, NSW, Australia*

JPA-13. **Performance Improvement of Rare-Earth Free High-Speed Multilayer IPMSM Using Dual-Phase Magnetic Material.** Y. Jung[1], *K. Kim*[2] and M. Lim[2] *1. Hyundai Motor Company, Hwaseong, The Republic of Korea; 2. Hanyang University, Seoul, The Republic of Korea*

JPA-14. **Investigation on Wide-Speed Operation of a New Five-Phase Fault-Tolerant Interior Permanent Magnet Motor from Perspective of Flux-Intensifying Effect.** *S. Deng*[1], L. Zhang[1] and D. Shen[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang City, China*

JPA-15. **Influence of Additional Air Gaps Between Stator Tooth and Back-Iron on Acoustic Performance of Spoke-Type Permanent Magnet Synchronous Motor.** *C. Liu*[1], X. Qiu[1,2], K. Zhou[1] and J. Yang[1,2] *1. School of Electric Engineering and Automation, Nanjing Normal University (NNU), Nanjing, China; 2. Nanjing Institute of Intelligent High-End Equipment Industry Co., Nanjing, China*

JPA-16. **Extended Virtual-Signal-Injection MTPA Control of New Five-Phase Flux-Intensifying Interior Permanent Magnet Motor with Compensation Factor.** *X. Chen*[1], L. Zhang[1], X. Zhao[1] and Y. Wang[2] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China; 2. State Grid Zhenjiang Power Supply Company, Zhenjiang, China*

JPA-17. **Withdrawn**

POSTER SESSION

Session JPB
PERMANENT MAGNET MACHINES VI (Poster Session)

Fei Zhao, Chair
Harbin Institute of Technology (Shenzhen), Shenzhen, China

JPB-01. **Influence of Phase Shift Angle on Performance of PMSM with Dual Three-Phase Star and Delta Connection.** *J. Yu*[1], J. Yang[1] and S. Huang[1] *1. Hunan University, Changsha, China*

JPB-02. **Analysis and Optimization of Dual Three-Phase PMSM for Integrated EMA with Harsh Space Constraint.** *S. Zhu*[1], J. Hu[1], K. Wang[1], Y. Guo[1], C. Liu[1] and Y. Bi[1] *1. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

JPB-03. **Axial Flux Permanent Magnet Electrical Machine with High Torque Density: Research on the Influence of Combined-Halbach Array on YASA Machine.** *Y. Lu*[1], Y. Kai[1], S. Songjun[1] and Y. Luo[1] *1. Huazhong University of Science and Technology, Wuhan, China*

JPB-04. **Thermal Characteristics and Cooling Methods of a Permanent Magnet Synchronous Motors with High Flux Density.** *J. Mao*[1], Y. Pei[1] and T. Yoshida[1] *1. Electrical and Electrical Engineering, Kyushu University, Fukuoka, Japan*

JPB-05. **Investigation of a New Split Stator-Permanent-Magnet Machine With Mechanical Manufacturing Consideration.** H. Wang[1], *C. Zhang*[1], Y. Liu[1] and J. Yang[1] *1. School of Electrical Engineering, Nanjing Normal University, Nanjing, China*

JPB-06. **A Dimension Reduction Transformation Method for the Hybrid Axial-Radial Machine.** *Z. Chen*[1], S. Sun[1], B. Xu[1], Y. Wang[1], Y. Kai[1] and Y. Luo[1] *1. Electrical and Electronic Engineering, Hua Zhong University of Science and Technology, Wuhan, China*

JPB-07. **Conductor Design Method Considering AC Resistance for High Efficiency of PMSM Using High Fill Factor Winding.** *K. Cha*[1] and M. Lim[2] *1. Advanced Mechatronics R&D Group, Korea Institute of Industrial Technology, Daegu, The Republic of Korea; 2. Department of Automotive Engineering, Hanyang University, Seoul, The Republic of Korea*

JPB-08. **Modeling and Analysis of Different Assembly Faults of a Dual-stator Low-speed High-torque Permanent Magnet Drive Machine.** *J. Liu*[1], C. Di[1], L. Wang[1] and X. Bao[1] *1. Hefei University of Technology, Hefei, China*

JPB-09. **Comparative Study of Field Modulation Effects On Consequent-Pole PM Machines with Different Stator Slot Configurations.** *Y. Li*[1,2], H. Lin[1], H. Yang[1] and Z. Zhao[1] *1. Jiangsu CRRC Electric Co., LTD, Yancheng, China; 2. School of Electrical Engineering and Automation, Anhui University, Hefei, China*

JPB-10. **Investigation on the Influence of Eccentricity on the AC Copper Loss of High Speed Slotless Permanent Magnet Motor.** *S. Dai*[1], J. Yang[1] and S. Huang[1] *1. Hunan University, Changsha, China*

JPB-11. **Model Predictive Torque Control for a Flux-Modulated Permanent Magnet Motor With Torque Harmonic Injection.** L. Quan[1], Y. Bai[1], *L. Xu*[1], X. Zhu[1] and L. Zhang[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

JPB-12. **Modeling of Wind Turbine Drive Trains for Finite Element Analysis.** *A. Swain*[1], C. Liu[2] and P. Pong[1] *1. Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ, United States; 2. School of Energy and Environment, City University of Hong Kong, Kowloon Tong, Hong Kong*

JPB-13. **Optimization and Design of U-Shaped In-Wheel Permanent Magnet Motor for High Torque and Low Weight.** *C. Han*[1], X. Zhu[1], D. Fan[1] and Z. Xiang[1] *1. Jiangsu University, Zhenjiang, China*

JPB-14. **High Torque Density and Lightweight Design of Permanent Magnet In-wheel Motor Based on Magnetic Field Modulation Effect.** Z. Xiang[1] and *S. Bi*[1] *1. Jiangsu University, Zhenjiang, China*

JPB-15. **High-Efficiency Region Analysis and Broadening Design of Permanent Magnet Motor Based on Variable Magnetic Field Effect.** L. Quan[1], *X. Yu*[1], D. Fan[1], Z. Xiang[1] and X. Zhu[1] *1. Jiangsu University, Zhenjiang, China*

JPB-16. **Scroll-Type Stator for Axial Field Electric Machines.** *C.U. Ubadigha*[1], P. Huang[1], T. Chang[1] and M. Tsai[2] *1. Electric Motor Technology Research Center, National Cheng Kung University, Tainan, Taiwan; 2. Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan*

JPB-17. **Torque Ripple Optimization of the Interior Permanent Magnet Motor for Electric Vehicles.** *Y. Chen*[2], H. Chang[2] and G. Chen[1] *1. Mechanical and Electro-Mechanical Engineering, Tamkang University, New Taipei, Taiwan; 2. Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan*

JPB-18. **Influence Studies of the Flux-Barriers and PM Arrangements on High-Speed Flux-Intensifying Interior Permanent Magnet Motor Performance.** *T. Huynh*[1], M. Hsieh[1], M. Tsai[2], P. Huang[2] and Z. Lee[2] *1. Electrical Engineering, National Cheng Kung University, Tainan, Taiwan; 2. Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan*

Session KOA
LINEAR MOTORS / ACTUATORS

Metin Aydin, Co-Chair
Kocaeli University, Umuttepe, Izmit, Turkey
Johannes Paulides, Co-Chair
Advanced Electromagnetics Group, Waalwijk, Netherlands

KOA-01. **3D Modeling of High-Temperature Superconducting Rotating Field Electrodynamic Maglev Motor.** *W. Qin*[1] *1. EE, Beijing Jiaotong University, Beijing, China*

KOA-02. **Design and Analysis of a Double Layer Coils Linear Motor with Series Magnetic Circuit Structure Using for Linear Dynamic Loading Platform.** *J. Mu*[1], H. Zhang[1], Y. Lou[1] and Y. Zhao[1] *1. Harbin Institute of Technology, Harbin, China*

KOA-03. **Dynamic Modeling and Analysis of Six-Degree-of-Freedom Vibration Device using Multi-Degree-of-Freedom Electromagnetic Actuator.** *K. Nagano*[1], A. Heya[1] and T. Inoue[1] *1. Mechanical Systems Engineering, Nagoya University, Nagoya, Japan*

KOA-04. **Design of Wrist Rehabilitation Exoskeleton Device with Magnetic Serial Elastic Actuator.** *L. Cheng*[1], Z. Chen[1] and J. Chang[1,2] *1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. Mechanical and Computer-Aided Engineering, National Formosa University, Huwei, Taiwan*

KOA-05. **Dual-Rotor Electrodynamic Wheel Force Analysis.** C. Bruce[1], M. Grubbs[1] and *J. Bird*[1] *1. Portland State University, Portland, OR, United States*

KOA-06. **Design of a Reaction Wheel with MRF-encapsulated Magnetic Ball.** *C. Hong-Siang*[1], K. Peng[1], K. Ho[2] and J. Chang[1,3] *1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. TECO Electric & Machinery Co., Taipei, Taiwan; 3. Mechanical and Computer-Aided Engineering, National Formosa University, Huwei, Taiwan*

KOA-07. **Force Generation Method of a Novel Three-Degree-of-Freedom Electromagnetic Actuator with Finger Ring Structure.** *Y. Dan*[1], A. Heya[1] and T. Inoue[1] *1. Mechanical Systems Engineering, Nagoya University, Nagoya, Japan*

KOA-08. **A Rare-Earth-Free Linear Motor Replacing Coreless Linear Motors with Neodymium Sintered Magnets.** *T. Akiyama*[1] and S. Imamori[1] *1. Fuji Electric Co., Ltd., Hino-city, Japan*

Session KPA
ENERGY HARVESTING AND LINEAR MACHINES (Poster Session)

Jang-Young Choi, Co-Chair
Chungnam National University, Daejeon, The Republic of Korea
Johannes Paulides, Co-Chair
Advanced Electromagnetics Group, Waalwijk, Netherlands

KPA-01. **Study on smoothing generated voltage in the vertical linear vibration generator.** *H. Kojima*[1], T. Maruyama[1], Y. Koyanagi[1], E. Shirahama[1] and S. Ohashi[1] *1. Kansai University, Suita-shi, Japan*

KPA-02. **Effects of the External Disturbances on Rotational Stability of the HTS Magnetic Bearings.** *K. Yagi*[1], R. Taniguchi[1], S. Ishida[1] and S. Ohashi[1] *1. Kansai University, Suita, Japan*

KPA-03. **Withdrawn**

KPA-04. **Design of magnetic levitation-based harvester for very low frequencies.** I. Royo-Silvestre[1,2], J. Beato-Lopez[1,2], J. Algueta-Miguel[3,4] and *C. Gomez-Polo*[1,2] *1. Departamento de Ciencias, Universidad Publica de Navarra, Pamplona, Spain; 2. Institute for Advanced Materials and Mathematics INAMAT2, Universidad Publica de Navarra, Pamplona, Spain; 3. Departamento de Ingeniería de Electricidad, Electrónica y Comunicación, Universidad Publica de Navarra, Pamplona, Spain; 4. Institute for Smart Cities (ISC), Universidad Publica de Navarra, Pamplona, Spain*

KPA-05. **Study of a Cancellation Coil for Reducing Magnetic Field Leakage in Contactless Power Transfer in Motion.** *M. Yokosawa*[1], S. Miyahara[1], F. Sato[1], H. Matsuki[2], K. Inada[3], T. Abe[3] and S. Sasaki[4] *1. Graduate School of Engineering, Tohoku-Gakuin University, Tagajo, Japan; 2. Tohoku University, Sendai, Japan; 3. NITTOKU Co., Ltd, Saitama, Japan; 4. Hikari Denshi Co., Ltd, Osaki, Japan*

KPA-06. **Switchable Frequency Response Based on Electropermanent Magnet Actuator for Wide-Range Operation of Electromagnetic Devices.** *M. Kato*[1] and F. Kitayama[1] *1. Ibaraki University, Hitachi, Japan*

KPA-07. **Design and Analysis of Wide-Bandwidth Actuator for Haptic Controller with Novel Magnetic Circuit.** *Z. Jiang*[1], J. Park[1] and S. Hwang[1] *1. Pusan National University, Busan, The Republic of Korea*

KPA-08. **Magnetic Properties Evaluation on Cold-Rolled Steel Plates with Bending Process.** *T. Kai*[1,2], S. Yamaguchi[1] and Y. Tsuchida[2] *1. Mitsubishi Electric Corporation, 8-1-1 Tsukaguchi-honmachi, Amagasaki, Japan; 2. Oita University, 700 Dannoharu, Oita, Japan*

KPA-09. **A Study of Stable Levitation Conditions Considering Propulsion of a Carrier in the Magnetically Levitated Conveyance System Using the Linear Stepper Motor.** *S. Mitsui*[1], K. Taniguchi[1] and S. Ohashi[1] *1. Electrical, Electronic and Information Engineering, Kansai University, Suita, Japan*

KPA-10. **Development Acoustic Device Using Giant Magnetostrictive Material: Fundamental Consideration on Output Performance Due to Differences in Material Properties.** *T. Kato*[6], H. Okazaki[6], T. Kitamura[1], F. Maehara[1], I. Kobayashi[1], J. Kuroda[2], D. Uchino[2], K. Ogawa[2], K. Ikeda[3], A. Endo[4], H. Kato[5], T. Narita[5] and M. Furui[6] *1. Course of Mechanical Engineering, Tokai University, Hiratsuka, Japan; 2. Course of Science and Technology, Tokai University, Hiratsuka, Japan; 3. Mechanical Engineering, Hokkaido University of Science, Sapporo, Japan; 4. Electrical Engineering, Fukuoka Institute of Technology, Fukuoka, Japan; 5. Prime Mover Engineering, Tokai University, Hiratsuka, Japan; 6. Mechanical Engineering, Tokyo University of Technology, Hachioji, Japan*

KPA-11. **Withdrawn**

KPA-12. **Placement of Electromagnets for Edge-Supported Maglev Systems: Fundamental Consideration on Tilting Angle of Electromagnets.** *S. Baba*[1], A. Endo[1], J. Kuroda[2], D. Uchino[2], K. Ogawa[2], K. Ikeda[3], T. Kato[4], T. Narita[2] and H. Kato[2] *1. Fukuoka Institute of Technology, Fukuoka, Japan; 2. Tokai University, Hiratsuka, Japan; 3. Hokkaido University of Science, Sapporo, Japan; 4. Tokyo University of Technology, Hachioji, Japan*

KPA-13. **2-D FEA Based Iron Loss Calculation Method for Linear Oscillating Actuator Considering Equivalent Circumferential Stack Length of Segmented Outer Stator Structure.** *J. Lee*[1], S. Park[1], P. Kim[1], D. Park[1] and M. Lim[1] *1. Hanyang University, Seoul, The Republic of Korea*

KPA-14. **Analysis and Modeling of a Flux-Switching Transverse-Flux Permanent Magnet Tube Linear Motor.** *D. Fu*[1], K. Wu[1], X. Wang[1] and X. Wu[1] *1. School of Electrical Engineering, China University of Mining and Technology, Xuzhou, China*

KPA-15. **Experimental Verification of Torque Ripple Suppression Method Using Coriolis Force Generated by Electromagnetic Oscillatory Actuator.** *D. Naganuma*[1] and M. Kato[1] *1. Electrical and Electronics Systems, Ibaraki University, Ibaraki, Japan*

KPA-16. **Bending Levitation System for Flexible Steel Plate (Experimental Consideration on Dynamic Behavior of Levitated Steel Plate).** *Y. Uchida*[1], R. Miyazaki[1], K. Ogawa[1], J. Kuroda[1], D. Uchino[1], K. Ikeda[2], T. Kato[3], A. Endo[4], T. Narita[1] and H. Kato[1] *1. Tokai University, Hiratsuka, Japan; 2. Hokkaido University of Science, Sapporo, Japan; 3. Tokyo University of Technology, Hachioji, Japan; 4. Fukuoka Institute of Technology, Fukuoka, Japan*

KPA-17. **An Evolutionary Computation Approach for the Electromagnetic Field Assessment of Eddy Current Motion Dampers.** *A. Adly*[2,1] and S. Abd-El-Hafiz[3] *1. Electric Power Engineering Department, Cairo University, Giza, Egypt; 2. Egypt-Japan University of Science and Technology (E-JUST), Alexandria, Egypt; 3. Engineering Mathematics Department, Cairo University, Giza, Egypt*

KPA-18. **An Examination of the Damping and Stiffness Terms Needed to Model the Dynamics of an Eddy Current/based Maglev Vehicle.** *J. Bird*[1] and C. Bruce[1] *1. Electrical and Computer Engineering, Portland State University, Portland, OR, United States*

KPA-19. **Simple design for magnetic field energy harvesting.** *K. Tashiro*[1] *1. Faculty of Engineering, Shinshu University, Nagano, Japan*

KPA-20. **Analysis and Optimization of Novel Series-SLSPC Compensation Network for PT-Symmetric WPT systems.** *Y. Gu*[1], Q. Zhu[1], J. Wang[1], L. Jia[2], G. Li[2], J. Chen[1] and Z. Zhang[1,3] *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China; 2. Beijing Aerospace Automatic Control Institute, Beijing, China; 3. International Institute for Innovative Design and Intelligent Manufacturing of Tianjin University, Shaoxing, China*

KPA-21. **An Integrated Rotary Transformer and 3-Phase Dual-Active-Bridge Converter for High Power Transfer in Novel X-rotor Wind Turbines.** *R. Yazdanpanah*[1], S. Mortazavizadeh[1], Y. Teng[1], O. Anaya-Lara[1] and D. Campos-Gaona[1] *1. Electronic and Electrical Engineering, University of Strathclyde, Glasgow, United Kingdom*

KPA-22. **Anisotropic magnetostriction for low-frequency energy harvesting applications.** *Y. Liu*[1], L. Daniel[2], B. Ducharne[4,3], G. Sebald[4], M. Lallart[3] and K. Makihara[1] *1. Department of Aerospace Engineering, Tohoku University, Sendai, Japan; 2. Université Paris-Saclay, CentraleSupélec, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, Saclay, France; 3. Univ. Lyon, INSA Lyon, LGEF EA682, Lyon, France; 4. ELyTMaX IRL3757, CNRS, Univ Lyon, INSA Lyon, Centrale Lyon, Université Claude Bernard Lyon 1, Tohoku University, Sendai, Japan*

KPA-23. **Design Consideration of Magnetic Energy Harvesting System: Comparison with Design of Current Transformer.** *S. Huh*[3], J. Koo[1], O. Jeong[2] and S. Ahn[3] *1. Ferraris Inc., Las Vegas, NV, United States; 2. Electronic Engineering, Sogang University, Seoul, The Republic of Korea; 3. CCS Graduate School of Mobility, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea*

Session LOA
SPECIAL MACHINES IV

Yacine Amara, Co-Chair
University of Le Havre, Le Havre, France
Elena Lomonova, Co-Chair
Technische Universiteit Eindhoven, Eindhoven, Netherlands

LOA-01. **Permanent-Magnet-Free Variable Flux Reluctance Machines: Towards a Nonlinear Magnetodynamic Modeling Framework for Heavy-Duty Applications.** ***(Invited)*** *D. Ceylan*[1] *1. Eindhoven University of Technology, Eindhoven, Netherlands*

LOA-02. **Investigation of Ferrofluid Cooling in Modular Permanent Magnet Machines.** *W. Zhang*[1], G. Li[1], Z. Zhu[1], B. Ren[2], Y. Chong[2] and M. Michon[2] *1. The University of Sheffield, Sheffield, United Kingdom; 2. Motor Design Ltd, Wrexham, United Kingdom*

LOA-03. **Analysis and Optimization of Asymmetric Multi-Layer Barrier Permanent Magnet Motor for Electric Vehicles.** *F. Li*[1], L. Shi[1], D. Xiao[1], Z. Qiao[1], X. Zhao[1] and H. Ding[2] *1. Shandong University of Technology, ZiBo, China; 2. Jiangsu Haopeng Machinery Co., Ltd., Xinghua, China*

LOA-04. **Open-Delta Flux-Modulating Consequent Pole Motors.** *H. Mitsuda*[1,2], T. Fukami[1], M. Koyama[1] and T. Tanaka[2] *1. Kanazawa Institute of Technology, Ishikawa, Japan; 2. Mitsubishi Electric Corporation, Hyogo, Japan*

LOA-05. **Inductance Map Regression of Doubly Excited Electrical Machines Considering Cross-Saturation.** *G. Bayazit*[1], E. Ilhan Caarls[1] and E. Lomonova[1] *1. Eindhoven University of Technology, Eindhoven, Netherlands*

LOA-06. **Model for Angular Dependency of the Intrinsic Coercivity Force of Ferrite Permanent Magnets.** *M. Silva*[1], E. Lind[1], A. Ibrayeva[1], S. Ghorai[2] and S. Eriksson[1] *1. Department of Electrical Engineering, Uppsala University, Uppsala, Sweden; 2. Department of Materials Science and Engineering, Uppsala University, Uppsala, Sweden*

LOA-07. **Design and Evaluation of a Linear Permanent Magnet Flux Switching Machine for Use in Dry Gravity Energy Storage.** *M. Mugyema*[1], M.J. Kamper[1] and R. Wang[1] *1. Electrical and Electronic Engineering, Stellenbosch University, Stellenbosch, South Africa*

LOA-08. **Iron Loss Analytical Prediction of IPMSMs Considering Multi-factor Effects Over the Drive Cycle of Electric Vehicles.** *L. Liu*[1], Y. Guo[1], G. Lei[1], W. Yin[2] and J. Zhu[2] *1. School of Electrical and Data Engineering, University of Technology Sydney, Sydney, NSW, Australia; 2. School of Electrical and Information Engineering, The University of Sydney, Sydney, NSW, Australia*

LOA-09. **A Novel Counter-Rotating Axial-Flux Hybrid-Excitation Permanent Magnet Machine with Dual-rotor.** *C. Xia*[1], Y. Feng[1], M. Jia[1], Y. Gao[1] and S. Huang[1] *1. College of Electrical and Information Engineering, Hunan University, Changsha, China*

LOA-10. **Comparison between Conical and Axial Flux Geometries of High-Speed Permanent Magnets Synchronous Machines.** *H. Taha*[1], G. Barakat[1], Y. Amara[1] and M. Hatoum[1] *1. Université Le Havre Normandie, Groupe de Recherche en Electrotechnique et Automatique du Havre (GREAH), Le Havre, France*

LOA-11. **Analysis of a Five-Phase Hybrid Excited Axial Switched-Flux Permanent Magnet Machine for HEV/EV Applications.** *J. Zhao*[1], Z. Lu[1], Q. Han[1], L. Wang[1] and L. Wang[1] *1. School of Electrical Engineering, Xi'an University of Technology, Xi'an, China*

LOA-12. **Comparative Analysis of Noise and Vibration for Dual Three-Phase IPMSM under Healthy and Multi-Phase Open-circuit Fault Operations.** *P. Song*[1], W. Li[1], Z. Li[1] and N. Kar[1] *1. Department of Electrical & Computer Engineering, University of Windsor, Windsor, ON, Canada*

Session LPA
SPECIAL MACHINES V
(Poster Session)

Mi-Ching Tsai, Co-Chair
National Cheng Kung University, Tainan, Taiwan
Chinweze Ubadigha, Co-Chair
National Cheng Kung University, Tainan, Taiwan

LPA-01. **Hybrid-Excitation Variable Flux Memory Motor for Enhancing Output Power Density in Traction Applications in Six-Step Operation Mode.** *R. Tsunata*[1], K. Yokomichi[1], M. Takemoto[1] and J. Imai[1] *1. Okayama University, Okayama, Japan*

LPA-02. **Initial Rotor Position Estimation for an Ultra-low Inductive Saliency Machine Based on Eddy Current Loss.** *H. Wang*[1], W. Xu[1] and Z. Jin[1] *1. School of Electrical Engineering, Southeast University, Nanjing, China*

LPA-03. **Toroidal Field Excitation for Axial-Field Double-Rotor Flux-Reversal DC Motors with Magnetic Differential.** *T. Yang*[1], K. Chau[1], Z. Hua[1] and H. Pang[1] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong*

LPA-04. **Torque Performance Enhancement for Hybrid PM Motor Considering Magnet Characteristic Difference and Variation.** Y. Chen[1], *X. Zhou*[1], Z. Li[1] and X. Zhu[2] *1. Yangzhou University, Yangzhou, China; 2. Jiangsu University, Zhenjiang, China*

LPA-05. **Novel Electrically Excited Doubly Salient Variable Reluctance Machine with High-Order-Harmonic Winding.** *F. Ni*[1], S. Niu[1], Z. Li[1] and X. Zhao[2] *1. Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Hong Kong; 2. School of Physics, Engineering and Technology, The University of York, York, United Kingdom*

LPA-06. **Principle and Analysis of Structure of Low-Speed High-Torque Gear Meshing Motor Driven by Radial Force.** G. Yu[1], *S. Sun*[1], L. Xiao[1], W. Zhang[1], X. Bai[1] and Y. Xu[1] *1. School of Electrical Engineering and Automa, Harbin Institute of Technology, Harbin, China*

LPA-07. **Power Factor Improvement of Variable Leakage Flux PM Motor Under Different Operation Conditions.** *X. Zhou*[1], X. Zhu[1], Z. Xiang[1], L. Xu[1], D. Fan[1] and T. Wang[1] *1. Jiangsu University, Zhenjiang, China*

LPA-08. **Experimental verification for electromagnetic and thermal characteristics of a high-speed permanent magnet motor with two different rotors.** *J. Woo*[1], H. Lee[1], J. Shin[2] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. TNE Korea, Cheongju-si, The Republic of Korea*

LPA-09. **Novel Stator Multi-Tooth Hybrid Permanent Magnet Memory Motor.** *L. Wang*[1] and W. Xu[1] *1. Southeast University, Nanjing, China*

LPA-10. **Influence of Split Ratio on Field Modulation Effect in Consequent-Pole Permanent Magnet Machine.** *Y. Li*[1,2], H. Lin[1], H. Yang[1] and Z. Zhao[3] *1. School of Electrical Engineering, Southeast University, Nanjing, China; 2. School of Electrical Engineering and Automation, Anhui University, Hefei, China; 3. Jiangsu CRRC Electric Co., LTD, Yancheng, China*

LPA-11. **Investigation on the Influence of Various Sensitivity Analysis Methods on the Performance of PMSMs.** *F. Li*[1], H. Zhao[1,2] and Z. Yin[1] *1. Robotics and Autonomous Systems Thrust, The Hong Kong University of Science and Technology(Guangzhou), Guangzhou, China; 2. Department of Electronic & Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong, China*

LPA-12. **Research on Motor Performance Based on Hybrid Lamination of Silicon Steel and Amorphous Alloy.** *W. Li*[1,2], H. Hu[1], Z. Li[1], J. Wang[1], D. Ma[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang City, China; 2. School of Electrical and Mechanical Engineering (Engineering Training Centre), XuChang University, Xuchang City, China*

LPA-13. **Study on the Properties of High Strength Silicon Steel on High-Speed Rotor under High-Frequency External-stress Extreme-Speed and Frequent-Temperature-change.** *M. Cheng*[1], Y. Li[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

LPA-14. **Research on High-Efficiency Motor Based on Ultra Low Resistance Graphene-Copper Wire.** *S. Xu*[1], J. Li[1] and R. Pei[1] *1. Department of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

LPA-15. **Equivalent Magnetic Network Modeling of Grain-Oriented Silicon Steel Sheets Permanent Magnet Linear Synchronous Motors.** T. Dong[1], *Z. Gao*[1], B. Zhang[1] and R. Fu[1] *1. Shenyang University of Technology, ShenYang, China*

LPA-16. **Design and Analysis of Low-Cost Double Rotor Axial Flux Permanent Magnet Synchronous Motor.** *C. Diao*[1], W. Zhao[1], H. Ding[1] and X. Wang[1] *1. Shandong University, Jinan, China*

LPA-17. **Investigation of a Novel Partitioned Stator Hybrid Excitation Spoke-Type Vernier Machine.** *D. Liu*[1], L. Wei[1], X. Tan[1], H. Zhou[2] and J. Yuan[2] *1. School of Intelligent Systems Engineering, Sun Yat-Sen University, Guangzhou, China; 2. School of Electrical Engineering and Automation, Wuhan University, Wuhan, China*

LPA-18. **Loss Model of Interior Permanent Magnet Synchronous Machine with Series Iron-Loss Resistance.** *Y. Ma*[1,2], H. Yuan[1,2], W. Yin[1,2], Y. Huan[1,2] and R. Zhao[1,2] *1. Zhejiang University, Hangzhou, China; 2. Zhejiang Provincial Key Laboratory of Electrical Machine Systems, Hangzhou, China*

LPA-19. **Comparison of Simulation Methods for Angular Dependency when Modeling Demagnetization.** *S. Eriksson*[1] and M. Silva[1] *1. Electrical Engineering, Uppsala University, Uppsala, Sweden*

LPA-20. **Multi-Objective Design Optimization of an IPMSM Drive System Based on Loss Minimization Control Strategy.** *L. Liu*[1], Y. Guo[1], G. Lei[1], W. Yin[2] and J. Zhu[2] *1. School of Electrical and Data Engineering, University of Technology Sydney, Sydney, NSW, Australia; 2. School of Electrical and Information Engineering, The University of Sydney, Sydney, NSW, Australia*

ORAL SESSIONS

Session MOA
HIGH FREQUENCY DEVICES & WIRELESS POWER TRANSMISSION I

Yacine Amara, Co-Chair
Université Le Havre Normandie, Le Havre, France
Shuangxia Niu, Co-Chair
The Hong Kong Polytechnic University, Kowloon, Hong Kong

MOA-01. **Semi-Analytical Non-Linear Physical Model of the Core Losses in Ferrite Ring Cores.** *T. Dimier*[1] and J. Biela[1] *1. D-ITET / HPE, ETH Zurich, Zürich, Switzerland*

MOA-02. **Iron loss characteristics for various magnetic materials under PWM inverter excitation.** *T. Yamaguchi*[1], H. Matsumori[1] and T. Kosaka[1] *1. Department of Electrical and Mechanical Engineering, Nagoya Institute of Technology, Nagoya-shi, Japan*

MOA-03. **Toroidal Nanocrystalline Powder Core with Trapezoidal Cross Section.** *X. Li*[1], Z. Luo[1], L. Shillaber[1], B. Hu[1], C. Jiang[2] and T. Long[1] *1. Department of Engineering, University of Cambridge, Cambridge, United Kingdom; 2. Department of Electrical Engineering, City University of Hong Kong, Hong Kong*

MOA-04. **Optimum Air Gap Selection in Powder Core Inductors.** *L. Solimene*[1], D. Cittanti[1], F. Mandrile[1], C. Ragusa[1] and R. Bojoi[1] *1. DENERG, Politecnico di Torino, Torino, Italy*

MOA-05. **Fabrication of CoFeB-SiO_2 films with large uniaxial anisotropic by facing target sputtering and its application to high frequency planar type spiral inductors.** *Y. Takamura*[1], H. Nitta[1], K. Kawahara[1], T. Kaneko[1], R. Ishido[2], T. Miyazaki[2], N. Hosoda[3], K. Fujisaki[3] and S. Nakagawa[1] *1. Tokyo Institute of Technology, Meguro-ku, Japan; 2. ROHM Co., Ltd, Kyoto, Japan; 3. Toyota Technological Institute, Nagoya, Japan*

MOA-06. **Semi–Lumped Model for U– or E–Cores for the Calculation of Frequency Dependent Complex Permeance.** *T. Dimier*[1] and J. Biela[1] *1. D-ITET / HPE, ETH Zurich, Zürich, Switzerland*

MOA-07. **Hysteresis Effect Induced Inductance Change and Power Loss for Boost Converter during the Voltage Conversion.** J. Lee[1], *C. Li*[2], C. Liao[3], T. Liao[3], K. Nidhi[3] and K. Chen[2] *1. Device Engineering, Vanguard International Semiconductor, Hinschu, Taiwan; 2. Department of Electrical and Computer Eng., National Yang Ming Chiao Tung University, Hinschu, Taiwan; 3. ESD, Richtek Technology Corp., ChuPei, Taiwan*

MOA-08. **Minor Loop Position and Area Measurement of Inductors for DC-DC converter Considering Excitation Process.** *K. Oda*[1], K. Takano[1] and K. Wada[1] *1. System Design, Tokyo Metropolitan University, Hachioji, Japan*

MOA-09. **Optimal Inductor Design for Power Electronic Converter.** *M. Haji Mohammadi*[1], I. Askarian[2], H. Abiane[1] and A. Knight[2] *1. Amirkabir University of Technology, Tehran, The Islamic Republic of Iran; 2. University of Calgary, Calgary, AB, Canada*

MOA-10. **Inductive heating based on VHF-ISM radio band frequencies as technology platform for efficient heating of metallic micro-scaled bonding layers in MEMS packaging.** *C. Hofmann*[1], M. Kroll[2], S. Panhale[2], M. Wiemer[1], A. Kunke[2], K. Hiller[3] and H. Kuhn[4,3] *1. System Packaging, Fraunhofer Institute for Electronic Nano Systems ENAS, Chemnitz, Germany; 2. Institute for Machine Tools and Production Processes, Chemnitz University of Technology, Chemnitz, Germany; 3. Center for Microtechnologies, Chemnitz University of Technology, Chemnitz, Germany; 4. Fraunhofer Institute for Electronic Nano Systems ENAS, Chemnitz, Germany*

MOA-11. **A Novel Planar Magnetic Flux Concentrator and Its Application in Wireless Power Transfer.** *J. Lu*[1] and X. Li[1] *1. School of EBE, Griffith University, Brisbane, QLD, Australia*

MOA-12. **Optimized High-Order Compensation Topology for PT-WPT Systems with Expanded Constant Power Region.** *Y. Gu*[1], J. Wang[1], Q. Zhu[1], Z. Liang[1], J. Chen[1] and Z. Zhang[1,2] *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China; 2. International Institute for Innovative Design and Intelligent Manufacturing of Tianjin University, Shaoxing, China*

MOA-13. **Analysis of Cross-Coupling Effect for Multi-Objective Wireless Power Transfer.** *H. Pang*[1], K. Chau[1], Z. Hua[1] and T. Yang[1] *1. Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong*

MOA-14. **Downsizing of High-Power Open-End Coil with Pure Water.** *I. Masuda*[1], M. Fukuoka[1] and M. Ishitobi[1] *1. National Institute of Technology, Nara College, Yamatokoriyama, Japan*

MOA-15. **Withdrawn**

MOA-16. **Constant Power Control against *M*/*R* with Expanded PT-Symmetric Range for Wireless In-Flight Charging of Drones.** *Y. Gu*[1], Q. Zhu[1], J. Wang[1], L. Jia[2], G. Li[2], J. Chen[1] and Z. Zhang[1,3] *1. School of Electrical and Information Engineering, Tianjin University, Tianjin, China; 2. Beijing Aerospace Automatic Control Institute, Beijing, China; 3. International Institute for Innovative Design and Intelligent Manufacturing of Tianjin University, Shaoxing, China*

MOA-17. **Dynamic Wireless Charging for Electric Vehicles with Autonomous Frequency Control.** *Z. Hua*[1], K. Chau[1], H. Pang[1] and T. Yang[1] *1. Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong, China*

Session MOB
POWER APPARATUSES I

Hamed Hamzehbahmani, Chair
Durham University, Durham, United Kingdom

MOB-01. **Stray Loss Evaluation of Power Transformers Using Simplified Air-core Model with Tank and Frame.** ***(Invited)*** *B. Liu*[1], T. Yasuhito[1], K. Fujiwara[1] and S. Imamori[2] *1. Doshisha University, KYOTO, Japan; 2. Advanced Technology Laboratory, Fuji Electric Co., Ltd., TOKYO, Japan*

MOB-02. **Noninvasive sensor patch for internal magnetic core characterization.** S. Nguedjang[1], A. Solignac[2], R. Sabariego[3], L. Morel[4], M. Raulet[4], B. Toutsop[1], P. Tsafack[1] and *B. Ducharne*[5] *1. Faculty of Engineering and Technology, University of Buea, Buea, Cameroon; 2. SPEC, CEA, CNRS, Université Paris-Saclay, CEA Saclay, Saclay, France; 3. Dept. of Electrical Engineering (ESAT), KU Leuven, Campus EnergyVille, Leuven, Belgium; 4. Laboratoire Ampère, Université de Lyon, Lyon, France; 5. ELyTMaX IRL3757, CNRS, Univ Lyon, INSA Lyon, Centrale Lyon, Université Claude Bernard Lyon 1, Tohoku University, Sendai, Japan*

MOB-03. **Investigation of the Magnetic Indicators Affected by Residual Strain when Testing Electrical Steel Sheets.** *S. Zhang*[1,2], B. Ducharne[2], S. Takeda[1], G. Sebald[1] and T. Uchimoto[1] *1. Tohoku University, Sendai, Japan; 2. INSA Lyon, Lyon, France*

MOB-04. **An Experimental-Analytical Approach for Condition Monitoring of Magnetic Cores with Predominant Focus on Axial Off-Set Between the Short Circuit Points.** H. Hamzehbahmani[1], R. Sabariego[2] and *B. Ducharne*[3] *1. Engineering, Durham University, Durham, United Kingdom; 2. KU Leuven, Genk, Belgium; 3. Univ Lyon, Lyon, France*

MOB-05. **Influence of Thickness on Eddy Current Losses in Materials Used as Clamping Structures in High-Power Electrical Machines.** *W.M. Mohand Oussaid*[1,2], A. Tounzi[4], R. Romary[3], A. Benabou[4], D. Laloy[1] and W. Boughanmi[1] *1. R&D, Jeumont Electric, Jeumont, France; 2. L2EP/LSEE, FRANCE, France; 3. Université d'Artois, Béthune, France; 4. Université de Lille, Lille, France*

MOB-06. **Air-Core Power Inductor with Structure of High Energy Density and Low Copper Loss.** E. Asahina[1], *M. Fukuoka*[2], I. Masuda[2], A. Nagai[2], K. Maeda[3] and M. Ishitobi[2] *1. Tohoku University, Sendai, Japan; 2. National Institute of Technology, Nara College, Nara, Japan; 3. DAIHEN Corporation, Osaka, Japan*

MOB-07. **Basic Characteristics of Orthogonal-Core-Type Variable Inductor with Permanent Magnets.** *S. Aizu*[1], K. Nakamura[1], T. Ohinata[2] and K. Arimatsu[2] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Tohoku Electric Power Co., Inc., Sendai, Japan*

MOB-08. **Coupled Field–Circuit Modeling and Analysis for Interturn Short-Circuit Faults in an Onboard Traction Transformer.** C. Yan[1], *W. Wang*[1], P. Zhang[1], Z. Liu[1], J. Shu[2] and B. Zhang[1] *1. Xi'an Jiaotong University, Xi'an, China; 2. Xi'an Thermal Power Research Institute Co., Ltd., Xi'an, China*

MOB-09. **Electromagnetic Vibration Analysis of High Frequency Transformer under Inter-Turn Short Circuits.** *H. Ding*[1], W. Zhao[1], C. Diao[1] and H. Zhao[2] *1. School of Electrical Engineering, Shandong University, Jinan, China; 2. School of Electrical and Electronic Engineering, North China Electric Power University, Beijing, China*

MOB-10. **A Structure Determination Method Based on High Frequency Skin Effect for Distribution Transformer Windings.** *B. Zhang*[1], Z. Gong[1] and T. Dong[1] *1. School of Electrical Engineering, Shenyang University of Technology, Shenyang, China*

MOB-11. **A Topological Design Optimization Approach for Winding Oil Flow Paths in ONAN Transformers Based on a Fluidic-Thermal Coupled Model.** *L. Li*[1], G. Zhu[1,3], Z. Wang[1] and S. Yang[2] *1. School of Electrical Engineering, Tiangong University, Tianjin, China; 2. College of Electrical Engineering, Zhejiang University, Hangzhou, China; 3. Power Electronics, Machines and Control Group, University of Nottingham, Nottingham, United Kingdom*

POSTER SESSION

Session MPA
HIGH FREQUENCY DEVICES & WIRELESS POWER TRANSMISSION II
(Poster Session)

Hiroaki Matsumori, Chair
Nagoya Institute of Technology, Aichi, Japan

MPA-01. **Modeling and Experimental Validation of Voltage Distribution in MFTs with Foil Windings.** *K. Iwai*[1], S. Pourkeivannour[2], M. Curti[2] and E. Lomonova[2] *1. Department of Electrical and Electronic Systems Engineering, Osaka Institute of Technology, Osaka, Japan; 2. Department of Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands*

MPA-02. **Micro-patterned wire wound chip inductor for GHz applications.** *R. Lamouri*[1], B. Nam[1], D. Kim[1], T. Song[3], W. Kim[2] and K. Kim[1] *1. Physics, Yeungnam University, Gyeongsan, The Republic of Korea; 2. Smart Lighting Research Center, Korea Photonics Technology Institute, Gwangju, The Republic of Korea; 3. R&D Center, Point Engineering Inc., Hwaseong, The Republic of Korea*

MPA-03. **Fundamental Study of Magnetic Particle Composite Core Made by Fused Deposition Modeling Method.** *S. Ikeda*[1], A. Honda[1] and N. Kita[1] *1. Department of Production Systems Engineering and Sciences, Komatsu University, Komatsu, Japan*

MPA-04. **Study on Magnetic Properties of Toroidal Cores Composed by Electrolytic Iron Powder with Different Shapes.** *Y. Kodama*[1], M. Nguyen[1], T. Miyazaki[2] and Y. Endo[1,3] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Faculty of Engineering, Tohoku University, Sendai, Japan; 3. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

MPA-05. **Application of Magnetic Composite Materials in Windings to Reduce Alternating-Current Resistance in Leakage Transformers.** *K. Shimura*[1], S. Kobayashi[1], M. Sato[1] and T. Mizuno[1] *1. Shinshu University Faculty of Engineering, Nagano, Japan*

MPA-06. **Fabrication of Planar Power Inductor for beyond 10 MHz Using Fe-based Composite Magnetic Core.** *R. Miyata*[1], S. Kimura[1], N. Kawada[1], T. Minamisawa[1], M. Sonehara[1], K. Miyaji[1] and T. Sato[1] *1. Electrical and Computer Engineering, Shinshu University, Nagano, Japan*

MPA-07. **Impact of the Capacitance Cancellation on Attenuation Characteristic of Common-Mode Inductors Based on MnZn Ferrites.** *S. Takahashi*[1] and K. Wada[2] *1. Seikei University, Musashino, Japan; 2. Tokyo Metropolitan University, Hachioji, Japan*

MPA-08. **A Data-Driven Inductor Modeling Technique Using Parametric Circuit Simulation and Deep Learning.** *T. Motomatsu*[4], T. Koga[1], N. Shigei[4], M. Yamaguchi[2], A. Itagaki[3] and Y. Ishizuka[1] *1. Nagasaki University, Nagasaki, Japan; 2. Tohoku University, Sendai, Japan; 3. Ryowa Electronics Co., LTD, Sendai, Japan; 4. Kagoshima University, Kagoshima, Japan*

MPA-09. **3D Wireless Power Transfer System with Three-Phase Skewed Cylindrical Coil.** *H. Taga*[1], F. Tanaka[1], Y. Sato[1] and H. Matsumoto[1] *1. Aoyama Gakuin University, Sagamihara, Japan*

MPA-10. **Metal Influence Suppression Method for Rotating Wireless Power Transfer System Based on Toroidal Double-D Coil.** L. Sha[1], *W. Yuan*[1] and X. Zhang[2,3] *1. Tiangong University, Tianjin, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 3. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

MPA-11. **Ferrite Pads Gap Thermal-Magnetic Evaluation and Mitigation for 11.1-kW Wireless Power Transfer.** X. Zhang[1,4], C. Hao[1,4], *R. Dou*[1,3], P. Zhang[2,4], Z. Yuan[1,4] and Q. Yang[1,4] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 2. Electrical Engineering, Tsinghua University, Beijing, China; 3. Electrical, Computer and Software Engineering, University of Auckland, Auckland, New Zealand; 4. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China*

MPA-12. **Propulsion and Control of Microrobot Using a Multiple Wireless Power Transfer Coil.** *D. Kim*[1] *1. Department of Automotive Engineering, Yeungnam University, Gyeongsan, The Republic of Korea*

MPA-13. **Magnetic Analysis and Control of Three-Phase Wireless EV Charging System Based on Quasi Z-source NPC Inverter.** *Y. Liu*[1], Z. Dong[1], S. Liu[1], B. Zhang[1], H. Wen[1] and C. Liu[1] *1. School of Energy and Environment, City University of Hong Kong, Hong Kong SAR, China*

MPA-14. **A Novel Hybrid Shielding Method with Single-Source Active Topology and Efficiency Stability for Wireless Power Transfer.** X. Zhang[1,2], S. Liu[1,2], *R. Dou*[1,3], F. Wang[1,2], P. Zhang[4], Z. Yuan[1,2] and Q. Yang[1,2] *1. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China; 2. Key Laboratory of Electromagnetic Field and Electrical Apparatus Reliability of Hebei Province, Hebei University of Technology, Tianjin, China; 3. Electrical, Computer and Software Engineering, University of Auckland, Auckland, New Zealand; 4. Electrical Engineering, Tsinghua University, Beijing, China*

Session MPB
POWER APPARATUSES II
(Poster Session)

Yoshiki Hane, Chair
Tohoku University, Sendai, Japan

MPB-01. **Electromagnetic Guideway System for Continuous Steel Plates (Fundamental Consideration on Vibration Characteristics from Damping Factor of Steel Plate).** *R. Kano*[1], T. Okubo[1], J. Kuroda[1], D. Uchino[1], K. Ogawa[1], K. Ikeda[2], T. Kato[4], A. Endo[3], H. Kato[1] and T. Narita[1] *1. Engineering, Tokai University, Chofu-shi, Japan; 2. Mechanical Engineering, Hokkaido University of Science, Sapporo, Japan; 3. Electrical Engineering, Fukuoka Institute of Technology, Fukuoka, Japan; 4. Mechanical Engineering, Tokyo University of Technology, Hachiouji, Japan*

MPB-02. **Modeling of Frequency-Dependent Magnetic Properties of Silicon Steel Sheet Considering the Effect of Magnetic Saturation.** *S. He*[1] and J. Li[2] *1. School of Electrical Engineering, Northeast Electric Power University, Jilin, China; 2. School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China*

MPB-03. **Magnetic Characteristics of Thread-Type Cores with Round Steel Wires.** *E. Jung*[1], K. Seo[2] and I. Park[1] *1. Sungkyunkwan University, Suwon-si, The Republic of Korea; 2. Seoul National University, Seoul, The Republic of Korea*

MPB-04. **Numerical Computation of Three-phase Enclosed GIL's Dynamic Electromagnetic Force Based on Field-Circuit Coupling Method.** *S. Cheng*[1], Y. Zhao[1], X. Yang[1] and J. Zhang[2] *1. Wuhan University, Wuhan, China; 2. University of Connecticut, Storrs, CT, United States*

MPB-05. **Study on the Influence of Thermal Radiation on Temperature Characteristics of Current Transformer.** *J. Yang*[1], C. Liao[1], T. Li[1], K. Li[1], Z. Qiu[1] and Z. Huang[1] *1. Nanchang University, Nanchang, China*

MPB-06. **Soft-Landing Mechanism Design Driven by Electromagnetic Repulsion Force with Application to Bypass Switch.** W. Yang[1], *F. Meng*[1], X. Huang[1] and G. Zhai[1] *1. Harbin Institute of Technology, Harbin, China*

MPB-07. **Eddy-Current Reduction Structure of Copper Foil Winding for Medium-Frequency Transformer in DC-grid Applications.** *N. Kurita*[1] and Y. Tanaka[2] *1. Research & Development Group, Hitachi Ltd., Hitachi, Japan; 2. Energy Business Unit, Hitachi Ltd., Hitachi, Japan*

MPB-08. **Topology Design of Multi-Port Fault Current Limiter in Shipboard MVDC System.** *H. Zhou*[1], J. Yuan[1], J. Liu[1], L. Wei[2], Y. Gao[3] and K. Muramatsu[4] *1. Wuhan University, Wuhan, China; 2. Sun Yat-Sen University, Guangzhou, China; 3. Oita University, Oita, Japan; 4. Saga University, Saga, Japan*

MPB-09. **Mechanical Vibration Analysis of Dry-Type Iron-Core Reactor Under Magnetostrictive, Maxwell and Lorentz Forces.** C. Liao[1], K. Li[1], Z. Qiu[1], *J. Yang*[1], T. Li[1] and Z. Jiang[1] *1. Department of Energy and Electrical Engineering, Nanchang University, Nanchang, China*

MPB-10. **A novel analytic method of zero-sequence leakage flux under DC bais.** *M. Zou*[1] and Z. Wang[1] *1. School of Automation, Chongqing University of Posts and Telecommunications, Chongqing, China*

MPB-11. **Electromagnetic Shield Design of 120 kA Pulse Inductor in Artificial Zero Crossing Circuit.** *Z. Li*[1], X. Bao[1], G. Gao[2] and H. Li[2] *1. Hefei University of Technology, Hefei, China; 2. Hefei Institutes of Physical Science, Hefei, China*

ORAL SESSIONS

Session NOA
MAGNETIC LOGIC, DOMAIN WALL DEVICES, ENERGY-ASSISTED RECORDING

Taichi Goto, Co-Chair
Tohoku University, Sendai, Japan
Peng Li, Co-Chair
University of Science and Technology of China, Hefei, China

NOA-01. **Towards the geometrical control of domain wall dynamics in complex 3D nanostructures.** ***(Invited)*** *S. Ruiz Gómez*[1], P. Morales Fernandey[1], C. Fernandez Gonzalez[1], M. Foerster[5], M. Angel[5], A. Mandziak[6], D. Wilgocka-Slezak[6], E. Mlynczak[6], M. Koenig[1], S. Seifert[1], L. Danesi[4], C. Abert[4], A. Hierro-Rodriguez[3], A. Pacheco[2] and C. Donnelly[1] *1. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 2. Instituto de Nanociencia y Materiales de Aragón, Zaragoza, Spain; 3. Universidad de Oviedo, Oviedo, Spain; 4. University of Vienna, Wien, Austria; 5. Alba Synchrotron, Barcelona, Spain; 6. National Centre for Synchrotron Radiation Solaris, Cracow, Poland*

NOA-02. **Electric-field controlled spin logic device.** *J. Hong*[1,2], X. Li[3], B. Yi[3], L. You[3], S. Zhang[3] and H. Singh[1,2] *1. University of California, Berkeley, Berkeley, CA, United States; 2. Hubei University of Technology, Wuhan, China; 3. Huazhong University of Science & Technology, Wuhan, China*

NOA-03. **A complete optomagnonic logic set.** *A. Kolosvetov*[1,2] and A. Chernov[1,2] *1. Moscow Institute of Physics and Technology (National Research University), Dolgoprudny, Russian Federation; 2. Russian Quantum Center, Moscow, Russian Federation*

NOA-04. **Manipulating Excitations in Magnetic Complex Oxides.** ***(Invited)*** *L.M. Caretta*[1], S. Kim[2], J. Analytis[3], K. Lee[2], C. Ross[4], G. Beach[4] and R. Ramesh[3] *1. Brown University, Providence, RI, United States; 2. Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 3. Physics, University of California, Berkeley, Berkeley, CA, United States; 4. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

NOA-05. **Targets and Challenges of Scaled Boolean Spintronic Circuits Based on Magnetic Tunnel Junction Transducers.** *F. Meng*[1,2], S. Lee[3], O. Zografos[1], M. Gupta[1], V. Nguyen[1], G. De Micheli[3], S. Cotofana[4], I. Asselberghs[1], C. Adelmann[1], G. Kar[1], S. Couet[1] and F. Ciubotaru[1] *1. Imec, Leuven, Belgium; 2. KU Leuven, Leuven, Belgium; 3. Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland; 4. Delft University of Technology, Delft, Netherlands*

NOA-06. **Energy-efficient optoelectronic domain-wall motion for logic computing.** *Z. Boyu*[1], Y. Xu[1], D. Zhu[1], X.L. Lin[1], M. Hehn[2], G. Malinowski[2], W. Zhao[1] and S. Mangin[2] *1. Beihang University, Beijing, China; 2. Institut Jean Lamour, Nancy, France*

NOA-07. **Simultaneous determination of the Heisenberg exchange, thickness and saturation magnetization from the spin wave dispersion.** ***(Invited)*** *H. Nembach*[1,2] *1. National Institute of Standards and Technology, Boulder, CO, United States; 2. University of Colorado, Boulder, CO, United States*

NOA-08. **Impact of Curie Temperature Distribution and Anisotropy Field Distribution on the User Density of HAMR under Modest Thermal Gradient.** *K. Hosen*[1] and R. Victora[1] *1. Department of Electrical and Computer Engineering, University of Minnesota Twin Cities, Minneapolis, MN, United States*

NOA-09. **Effect of film thickness on microwave assisted switching behavior.** *N. Kikuchi*[1], K. Sato[1], M. Hatayama[1], T. Shimatsu[1] and S. Okamoto[1] *1. Tohoku University, Sendai, Japan*

NOA-10. **Ferrimagnet-ferromagnet phase transition in $Mn_{4-x}Ga_xN$ epitaxial films by X-ray magnetic circular dichroism.** *A. Hatate*[1], T. Komori[1], T. Yasuda[1], T. Horiuchi[1], K. Amemiya[2], K. Toko[1] and T. Suemasu[1] *1. University of Tsukuba, Tsukuba, Japan; 2. KEK, Tsukuba, Japan*

Session NOB
NEUROMORPHIC AND UNCONVENTIONAL COMPUTING

Shunsuke Fukami, Co-Chair
Tohoku University, Sendai, Japan
Carl Boone, Co-Chair
Aerospace Corporation, Los Angeles, CA, United States

NOB-01. **Spintronic integrate-fire-reset neuron with stochasticity for neuromorphic computing.** ***(Invited)*** *R. Mishra*[1,2], Q. Yang[2], Y. Cen[2], G. Shi[2], R. Sharma[2], X. Fong[2] and H. Yang[2] *1. Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, Delhi, India; 2. Electrical and Computer Engineering, National University of Singapore, Singapore*

NOB-02. **A single magnetic tunnel junction for the implementation of a spiking neuron.** D. Rodrigues[1], R. Moukhader[2], A. Pontlevy[2], A. Hamadeh[3], Z. Zeng[4], M. Carpentieri[1] and *G. Finocchio*[2] *1. Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy; 2. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 3. Fachbereich Physik, TU Kaiserslautern, Kaiserslautern, Germany; 4. Key Laboratory of Multifunctional Nanomaterials and Smart Systems, Suzhou Institute of Nano-Tech and Nano-Bionics, Jiangsu, China*

NOB-03. **Weighted Spin Torque Nano-Oscillator System for Neuromorphic Computing.** *T. Boehnert*[1], Y. Rezaeiyan[2], M. Claro[1], L. Benetti[1], A. Jenkins[1], H. Farkhani[2], F. Moradi[2] and R. Ferreira[1] *1. Spintronics, International Iberian Nanotechnology Laboratory, Braga, Portugal; 2. Integrated Circuits and Electronics Laboratory, Aarhus University, Aarhus, Denmark*

NOB-04. **Magnetization dynamics of dual free layer p-MTJ.** *L. Farcis*[1], B. Teixeira[1], P. Talatchian[1], D. Salomoni[1], U. Ebels[1], S. Auffret[1], B. Dieny[1], A. Mizrahi[2], J. Grollier[2], R. Sousa[1] and L.D. Buda-Prejbeanu[1] *1. CEA-SPINTEC, Grenoble, France; 2. Université Paris-Sud, CNRS/Thales, Palaiseau, France*

NOB-05. **A semi-analytical model to simulate the spin-diode effect and accelerate its use in neuromorphic computing.** *C. Chopin*[1], L. Martins[2], L. Benetti[2], S. de Wergifosse[1], A. Jenkins[2], R. Ferreira[2] and F. Abreu Araujo[1] *1. UCLouvain, Louvain la Neuve, Belgium; 2. INL, Braga, Portugal*

NOB-06. **A Spin Wave Time-Multiplexed Ising Machine.** ***(Invited)***
A. Litvinenko[1], R. Khymyn[1], V. Gonzalez[1], A. Awad[1], V. Tyberkevych[2], A.N. Slavin[2] and J. Åkerman[1]
1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Department of Physics, Oakland University, Rochester, MI, United States

NOB-07. **Physical reservoir computing utilizing voltage controlled magnetic anisotropy effect.** *T. Taniguchi*[1], S. Tsunegi[1,2] and Y. Utsumi[3] *1. Research Center for Emerging Computing Technologies, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. JST-PRESTO, Saitama, Japan; 3. Mie University, Tsu, Japan*

NOB-08. **Using magnetic tunnel junctions as unconventional computing devices.** *A. Grimaldi*[1], L. Mazza[2], P. Tullo[2], D. Rodrigues[2], V. Crupi[1], M. Carpentieri[2], V. Puliafito[2] and G. Finocchio[1] *1. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 2. Department of Electrical and Information Engineering, Polytechnic of Bari, Bari, Italy*

NOB-09. **Bipolar Coupling of Perpendicular Superparamagnetic Tunnel Junctions for Stochastic Unconventional Computing.** *N. Phan*[1], L. Soumah[1], A. Sidi El Valli[1], L. Anghel[1], M. Daniels[2], R. Sousa[1], J. Langer[3], J. Wrona[3], A. Madhavan[2,4], M.D. Stiles[2], U. Ebels[1] and P. Talatchian[1]
1. SPINTEC, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France; 2. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Singulus Technologies AG, Kahl am Main, Germany; 4. Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, United States

NOB-10. **Demonstration of Synaptic Behaviour in a Spintronic Device for On-Chip Learning in Long Short Term Memory (LSTM) Networks.** *R. Yadav*[1], P. Gupta[1], A. Sadashiva[2], P.K. Muduli[1] and D. Bhowmik[2] *1. Physics, Indian Institute of Technology Delhi, New Delhi, India; 2. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

NOB-11. **Magnetic tunnel junction-based crossbars: improving neural network performance by reducing the impact of non-idealities.** *W. Borders*[1], N. Prasad[1,2], B.D. Hoskins[1], A. Madhavan[3], M. Daniels[1], V. Georgiou[4], T. Santos[4], P.M. Braganca[4], M.D. Stiles[1] and J.J. McClelland[1] *1. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Department of Chemistry and Biochemistry, University of Maryland, College Park, MD, United States; 3. Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, United States; 4. Western Digital Research Center, Western Digital, San Jose, CA, United States*

NOB-12. **A Stochastic Computing Scheme Using Computational Random Access Memory (SC-CRAM).** *B. Zink*[1], Y. Lv[1], M. Zabihi[1], H. Cilasun[1], S. Sapatnekar[1], U. Karpuzcu[1], M. Riedel[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

NOB-13. **Power-Aware Quantization Circuits in Analog In-Memory Computing with STT-MRAM Macro.** *M. Zhou*[1], Y. Guo[1], J. Fu[1] and H. Cai[1] *1. Southeast University, Nanjing, China*

NOB-14. **Physically Unclonable Function by Magneto-Optical Kerr Effect.** *J. Lee*[1], J. Lee[1], S. Yoon[1], M. Lee[1], J. Lee[2], D. Kim[3], S. Choe[3], Y. Jang[4], J. Park[4] and Y. Kim[1] *1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. Semiconductor Systems Engineering, Korea University, Seoul, The Republic of Korea; 3. Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea; 4. Electrical Engineering, Korea University, Seoul, The Republic of Korea*

POSTER SESSION

Session NPA
ENERGY-ASSISTED RECORDING, DOMAIN WALL DEVICES, NEUROMORPHIC AND UNCONVENTIONAL COMPUTING (Poster Session)

Akinobu Yamaguchi, Co-Chair
University of Hyogo, Ako-gun, Japan
Michelle Jamer, Co-Chair
United States Naval Academy, Sterling, VA, United States

NPA-01. **Blocking phenomenon of hard/soft bilayer FePt grains in granular film.** *D. Isurugi*[1], T. Saito[1], K. Tham[3], T. Ogawa[1], Y. Tanaka[2], S. Greaves[2] and S. Saito[1] *1. Department of Electronic Engineering, Tohoku University, Sendai, Japan; 2. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 3. Tanaka Kikinzoku Kogyo K. K., Tsukuba, Japan*

NPA-02. **Effect of C replacement on magnetic properties and nanostructure of FePt-nitride granular film for HAMR media.** *K. Tham*[1], R. Kushibiki[1] and S. Saito[2] *1. Tanaka Kikinzoku Kogyo, Tsukuba, Japan; 2. Electronic Engineering, Tohoku University, Sendai, Japan*

NPA-03. **Control of Information Flow in Arrays of Spin-Torque Oscillators.** *T. Ise*[1], S. Greaves[1] and Y. Tanaka[1] *1. RIEC, Tohoku University, Sendai, Japan*

NPA-04. **Atomistic Simulations on the Effects of Grain Size in HAMR.** *D.R. Papp*[1], R.F. Evans[1] and R.W. Chantrell[1] *1. School of Physics, Engineering and Technology, University of York, York, United Kingdom*

NPA-05. **A multi-state memory device based on the manipulation of a single skyrmion using spin-polarized current.** *W.Z. Al Saidi*[1] *1. Physics, Sultan Qaboos University, Muscat, Oman*

NPA-06. **Development of Ultra-Thin CoPt Films with Electrodeposition for Three-Dimensional Domain Wall Motion Memory.** *T. Huang*[1], Y. Takamura[1], M. Saito[2], M.M. Hasan[2], S. Kasai[3], Y. Sonobe[2] and S. Nakagawa[1] *1. Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Meguro, Japan; 2. Research Organization for Nano and Life Innovation, Waseda University, Shinjuku, Japan; 3. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

NPA-07. **Withdrawn**

NPA-08. **Investigations of Domain Wall Dynamics in Ladder Domain Wall Devices for Neuromorphic Computing.** *H. Rahaman*[1], D. Kumar[1], M. Ramu[1], H.J. Chung[2], S. Lim[2] and S. Piramanayagam[1] *1. Nanyang Technological University, Singapore, Singapore; 2. Institute of Materials Research and Engineering, A*STAR, Singapore, Singapore*

NPA-09. **Discrete Anomalous Hall Resistance-Based Quantized Convolutional Neural Network.** *A.H. Lone*[1], X. Zou[1], H. Li[1], N. El-Atab[1] and H. Fariborzi[1] *1. CEMSE (Integrated Circuits and Systems Group), King Abdullah University of Science and Technology, Jeddah, Saudi Arabia*

NPA-10. **Demonstration of Pavlov associative memory by implementation of rate coding using magnetic tunnel junction neurons.** *J. Jang*[1] and W. Park[1] *1. Hanyang University, Seoul, The Republic of Korea*

NPA-11. **Modelling in-device inference and classification of binary digits using nonlinear dynamics of spin Hall oscillator.** *J.R. Mohan*[1], C. Yamanaka[1], R. Feng[1], A. Mathew[1], Y. Nakamura[1], R. Medwal[2], S. Gupta[3], R. Rawat[3] and Y. Fukuma[1,4] *1. Department of Physics and Information Technology, Kyushu Institute of Technology, IIzuka, Japan; 2. Department of Physics, Indian Institute of Technology, Kanpur, India; 3. Natural Sciences and Science Education, National Institute of Education, Nanyang Technological University, Singapore, Singapore; 4. Research Center for Neuromorphic AI hardware, Kyushu Institute of Technology, Kitakyushu, Japan*

NPA-12. **Antiferromagnetic Artificial Neuron Modeling of Biological Neural Networks.** *H. Bradley*[1], L. Quach[2], S. Louis[3] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States; 2. Oakland University William Beaumont School of Medicine, Rochester, MI, United States; 3. Electrical and Computer Engineering, Oakland University, Rochester, MI, United States*

NPA-13. **Stochastic Spin-Orbit Torque Switching in Magnetic Trilayers for True Random Number Generation.** *D. Han*[1], G. Lee[2], J. Ryu[1], M. Kohda[3], J. Nitta[3], K. Kim[2] and B. Park[1] *1. Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 3. Spintronics Research Network, Tohoku University, Sendai, Japan*

NPA-14. **Computing-in-Memory with Enhanced STT-MRAM Readout Margin.** *S. Wang*[1] and H. Cai[1] *1. Southeast University, Nanjing, China*

NPA-15. **Resistance-Sum Architecture for Voltage-Controlled SOT-MRAM Based Computing-in-Memory with Hybrid References.** *C. Xiao*[1], Y. Ma[1], D. Jiang[1], G. Ji[1], H. Gu[1], Y. Zhang[1], J. Tang[1], H. Wu[1] and T. Nan[1] *1. School of Integrated Circuits, Tsinghua University, Beijing, China*

NPA-16. **A 4T2MTJ Bit-Cell Supporting Ultra-Low Power Read Operation and In-Situ 1-bit Multiplication.** *Z. Qiu*[1] and H. Cai[1] *1. Southeast University, Nanjing, China*

ORAL SESSIONS

Session OOA
MAGNETIC RECORDING: MEDIA, HEADS & MODELS I

Simon Greaves, Chair
Tohoku University, Sendai, Japan

OOA-01. **Bias sputtering of granular L10-FePt film with hexagonal boron nitride grain boundaries.** C. Xu[1,2], V. Bollapragada[1,2], D.E. Laughlin[1,3] and *J. Zhu*[1,2] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

OOA-02. **Data-driven optimization of FePt heat-assisted magnetic recording media accelerated by deep learning TEM image segmentation.** *N. Kulesh*[1], A. Bolyachkin[2], I. Suzuki[1], Y. Takahashi[1] and H. Sepehri-Amin[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 2. International Center for Young Scientists, National Institute for Materials Science, Tsukuba, Japan*

OOA-03. **SNR Impact of Magnetic Capping Layer in Granular FePt-L10 Media.** *J. Zhu*[1], L. Zhang[2] and K. Shimizu[2] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Resonac, Minato-ku, Japan*

OOA-04. **Identification of Nonlinear Reader Distortion in Magnetic Recording.** *B. Valcu*[1], R. Wood[2] and S. Granz[3] *1. Headway Technologies, Milpitas, CA, United States; 2. Washington State University, Pullman, WA, United States; 3. Seagate Technology, Bloomington, MN, United States*

OOA-05. **An Adaptive Minimum-Frame-Error-Rate BCJR Detector for Magnetic Recording.** *Y. Zhang*[1], S. Shi[2] and J.R. Barry[1] *1. School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, United States; 2. Western Digital, San Jose, CA, United States*

OOA-06. **Flying Height Increase Problems on Heat Assisted Magnetic Recording.** *Y. Taniguchi*[1] and Y. Aoki[1] *1. Western Digital Technologies GK, Fujisawa, Japan*

OOA-07. **A Hybrid Simulation for Smear Growth on HAMR Heads.** *R. Tom*[1], Q. Cheng[1] and D.B. Bogy[1] *1. Mechanical Engineering, University of California, Berkeley, Berkeley, CA, United States*

OOA-08. **Mode hopping impact on NFT protrusion measurement in HAMR.** *A. Sakoguchi*[1], M. Furukawa[1], S. Nishida[1], R. Nishikura[1] and K. Tasaka[1] *1. Western Digital Technologies GK, Fujisawa, Japan*

Session OOB
MRAM & RELATED DEVICES I

Randall Victora, Co-Chair
University of Minnesota, Minneapolis, MN, United States
Seiji Mitani, Co-Chair
National Institute for Materials Science, Tsukuba, Japan

OOB-01. **Perpendicular Magnetization Switching in Heusler Alloy Films.** *L. Ren*[1], C. Zhou[2], L. Liu[3], J. Chen[2] and K. Teo[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore; 2. Department of Materials Science and Engineering, National University of Singapore, Singapore; 3. School of Physics and Astronomy, Shanghai Jiao Tong University, Shanghai, China*

OOB-02. **Integration of BiSb topological insulator and CoFeB/MgO with perpendicular magnetic anisotropy using an oxide interfacial layer for ultralow power spin-orbit torque magnetic memory.** *H. Ho*[1], R. Zhang[1], T. Shirokura[1], S. Takahashi[2], Y. Hirayama[2] and H.N. Pham[1] *1. Electrical and Electric Engineering, Tokyo Institute of Technology, Tokyo, Japan; 2. Samsung Device Solutions R&D Japan, Samsung Japan Corporation, Yokohama, Japan*

OOB-03. **FePd Single Layer and Synthetic Antiferromagnet with Low Damping and Crystalline Perpendicular Magnetic Anisotropy on Amorphous Si/SiO_2 Wafers.** *D. Lyu*[1], J.E. Shoup[2], D. Huang[1], X. Wang[1], D.B. Gopman[2] and J. Wang[1] *1. University of Minnesota, Minneapolis, MN, United States; 2. National Institute of Standards and Technology, Gaithersburg, MD, United States*

OOB-04. **Achieving Uniaxial In-Plane Magnetocrystalline Anisotropy to Enable Scalable SOT-MRAM Devices.** *S. Nallan*[1] and J. Zhu[1] *1. Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

OOB-05. **High-performance Type-y Spin-Orbit Torque MRAM Devices.** *H. Zhang*[1], S. Lu[1], K. Cao[1], H. Liu[2] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Truth Memory Tech. Corporation, Beijing, China*

OOB-06. **Spacer-Less Free-Layer for High-TMR Double Magnetic Tunnel Junction MRAM.** *R. Carpenter*[1], S. Rao[1], M. Gama Monteiro[1], S. Van Beek[1], N. Jossart[1], S. Kundu[1], S. Houshmand Sharifi[1] and S. Couet[1] *1. Imec, Leuven, Belgium*

OOB-07. **Magnetic Random Access Memory: From Uniaxial to Unidirectional.** *D. Zhu*[1], Z. Guo[1], A. Du[1], D. Xiong[1], R. Xiao[1], W. Cai[1], K. Shi[1], S. Peng[1], K. Cao[1], S. Lu[1], D. Zhu[1], G. Wang[2], H. Liu[2], Q. Leng[1] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Truth Memory Tech. Corporation, Beijing, China*

OOB-08. **Impact of SOT & STT stress on MTJ degradation in SOT-MRAM.** *S. Van Beek*[1], V. Kateel[1], K. Cai[1], N. Jossart[1], S. Rao[1] and S. Couet[1] *1. Imec, Heverlee, Belgium*

OOB-09. **Importance of SAF Stability against Temperature and Magnetic Field in Automotive-Grade-1 STT-MRAM Wafer Electrical Testing.** *M. Hindenberg*[1], J. Müller[2], C.A. Durner[1], T. Gurieva[1], H. Yoon[2], A. Titova[2], G. Wolf[2], Y. Otani[2] and M. Wagner-Reetz[1] *1. Fraunhofer Institute for Photonic Microsystems, Dresden, Germany; 2. GlobalFoundries, Dresden, Germany*

OOB-10. **Dipolar core-shell cells with enhanced write speed and reduced cross-talk of perpendicular shape anisotropy MRAM.** *N. Caçoilo*[1], R. Sousa[1], B. Dieny[1], L.D. Buda-Prejbeanu[1], O. Fruchart[1] and I. Prejbeanu[1] *1. CEA, CNRS, Grenoble-INP, SPINTEC, Université Grenoble Alpes, Grenoble, France*

OOB-11. **Reduced Switching Current with a Light Metal in a Tri-Layer Spin-orbit Torque Device.** *Y. Wu*[1], C. Cheng[1], Y. Lin[1], M. Chen[2] and Y. Tseng[1] *1. Materials Science & Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 2. Powerchip Semiconductor Manufacturing Corporation, Hsinchu, Taiwan*

OOB-12. **Switching Field Distributions in MRAM Elements.** *W.J. Frost*[1], G. Vallejo Fernandez[1], R. Carpenter[2], S. Couet[2] and K. O'Grady[1] *1. School of Physics, Engineering and Technology, University of York, York, United Kingdom; 2. Imec, Leuven, Belgium*

OOB-13. **Pulse Shaping Strategies for Efficient Spin-Orbit Torque Switching of Magnetic Tunnel Junctions.** *M. Hoffmann*[1], V. Krizakova[1], V. Kateel[2], K. Cai[2], S. Couet[2] and P. Gambardella[1] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Imec, Leuven, Belgium*

OOB-14. **Automated Characterization of Time-Resolved Switching Dynamics in MRAM Magnetic Tunnel Junctions Writing Operation.** *Q. Stainer*[1], S. Lequeux[1], A. Bussiere[1], K. Garello[2] and S. Salimy[1] *1. Hprobe, Eybens, France; 2. CEA-SPINTEC, Grenoble, France*

OOB-15. **Picosecond optical information storage in molecular-metal oxide interfaces.** *M. Habib*[1,2], M. Rogers[1], G. Teobaldi[3], T. Moorsom[1], O. Johansson[4], P.S. Keatley[5], R. Hicken[5], M. Valvidares[6], P. Gargiani[6], N. Alosaimi[1], E. Poli[3], M. Ali[1], G. Burnell[1], B.J. Hickey[1] and O. Cespedes[1] *1. Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Science, Engineering & Technology School, Khulna University, Khulna, Bangladesh; 3. Scientific Computing Department, Science & Technology Facilities Council UKRI, Didcot, United Kingdom; 4. EaStCHEM School of Chemistry, University of Edinburgh, Edinburgh, United Kingdom; 5. School of Physics, University of Exeter, Exeter, United Kingdom; 6. ALBA Synchrotron Light Source, Barcelona, Spain*

OOB-16. **Deep Learning-Based Adaptive Error-Correction Decoding for Spin-Torque Transfer Magnetic Random Access Memory (STT-MRAM).** *X. Zhong*[1], K. Cai[1], P. Kang[1], S. Guanghui[2] and B. Dai[3] *1. Science, Mathematics and Technology Cluster, Singapore University of Technology and Design, Singapore, Singapore; 2. State Key Lab of Integrated Services Networks, Xidian University, Xi'an, China; 3. School of Internet of Things, Nanjing University of Posts and Telecommunications, Nanjing, China*

POSTER SESSION

Session OPA
MAGNETIC RECORDING: MEDIA, HEADS & MODELS II (Poster Session)

Takehiko Hamaguchi, Chair
Western Digital Technologies, San Jose, CA, United States

OPA-01. **Challenge of Media Noise Suppression with Oxygen Control in Granular Structure for CoPtCr-Based Sputtered Tape towards 400 Gb/in^2.** *J. Tachibana*[1], H. Kobayashi[1], T. Sai[1], S. Kodama[1], T. Aizawa[1], A. Yamaguchi[1] and S. Saito[2] *1. Tape Media Dept., Sony Storage Media Solutions Corporation, Tagajyo, Japan; 2. Department of Electronic Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan*

OPA-02. **Simulation Analysis of Thermal Decay and Read-Write Characteristics Depending on the Structure of Sputtered Tape Media.** *I. Tagawa*[1], S. Kodama[2], J. Tachibana[2], T. Aizawa[2] and M. Yamaga[2] *1. Tohoku Institute of Technology, Sendai, Japan; 2. Sony Storage Media Solutions Corporation, Tagajyo, Japan*

OPA-03. **A Study on Coding of Noise Model for Storage Channel Systems.** Y. Kurihara[1], M.Z. Ahmed[2], K. Urabe[1], M. Shirai[1] and *R. Murakami*[1] *1. National Instutute of Technology (KOSEN), Niihama College, Niihama, Japan; 2. University of Plymouth, Plymouth, United Kingdom*

OPA-04. **Multitrack Recording and Two-Stage Decoding Schemes for Heated Dot Magnetic Recording with Double-Layered Bit Patterned Media.** *H. Saito*[1] *1. School of Engineering, Kogakuin University, Tokyo, Japan*

OPA-05. **Design of Non-Isolated Modulation Code with Minimum Hamming Distance of 3 for Bit-Patterned Media Recording Systems.** T.A. Nguyen[1] and *J. Lee*[1] *1. Soongsil University, Seoul, The Republic of Korea*

OPA-06. **A Study on Accelerating SP Decoding by Neural Network in SMR System.** *M. Nishikawa*[1], Y. Nakamura[1], Y. Kanai[2] and Y. Okamoto[1] *1. Ehime University, Matsuyama, Japan; 2. Niigata Institute of Technology, Kashiwazaki, Japan*

OPA-07. **Effect of Humidity on Head Smear Generation in Head-Assisted Magnetic Recording.** *H. Tani*[1], H. Kurafuji[2], N. Tagawa[1], S. Kawada[1], R. Lu[1] and S. Koganezawa[1] *1. Mechanical Engineering, Kansai University, Suita-shi, Japan; 2. Graduate School of Kansai University, Suita-shi, Japan*

OPA-08. **Optical Traps: a Hidden Factor in HAMR Head-Disk Interface.** *R. Tom*[1], R. Smith[2], O. Ruiz[2] and Q. Dai[2] *1. Mechanical Engineering, University of California, Berkeley, Berkeley, CA, United States; 2. The CTO Office, Western Digital Technologies, San Jose, CA, United States*

OPA-09. **Feasibility study of reduction in sound-pressure induced vibration in hard disk drives using an adaptive feed-forward control.** *S. Koganezawa*[1], K. Funai[1], H. Tani[1], R. Lu[1] and S. Kawada[1] *1. Kansai University, Suita, Japan*

POSTER SESSION

Session OPB
MRAM & RELATED DEVICES II
(Poster Session)

Hiroaki Yoda, Chair
YODA-S, Inc., Tsukuba, Japan

OPB-01. **Withdrawn**

OPB-02. **Field-free spin-orbit torque switching in sub-100nm magnetic tunnel junctions based on IrMn/CoFeB structures.** *W. Li*[1], Z. Liu[1], S. Peng[1], J. Lu[1], L. Jiahao[1], A. Du[1] and W. Zhao[1] *1. Beihang University, Beijing, China*

OPB-03. **Current Induced Switching of Co/Pd Memory Layer in CPP-GMR with Perpendicularly Magnetized SAF Pinned Layer.** *D. Pan*[1], D. Oshima[1] and T. Kato[1,2] *1. Electronics, Nagoya University, Nagoya, Japan; 2. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*

OPB-04. **Toward Low Soft Error Sensitivity and Latency Near Memory Computing with EB MRAM.** *Y.Y. Li*[1], D. Zhu[1], W.S. Zhao[1], J.K. Wang[1] and Y. Zhang[1] *1. Beihang University, Beijing, China*

OPB-05. **Dynamical switching properties and downsize scalability in perpendicular shape anisotropy MTJ.** *N. Caçoilo*[1], B. Teixeira[1], R. Sousa[1], B. Dieny[1], L.D. Buda-Prejbeanu[1], O. Fruchart[1] and I. Prejbeanu[1] *1. CEA, CNRS, Grenoble-INP, SPINTEC, Université Grenoble Alpes, Grenoble, France*

OPB-06. **A Novel Radiation Hardened Design of Magnetic Random Access Memory for Multi-Node Upset Tolerance.** *Z. Wang*[1], Y. Wang[2] and H. Cai[1] *1. Southeast University, Nanjing, China; 2. Nanjing University of Aeronautics and Astronautics, Nanjing, China*

OPB-07. **A Differential STT-MRAM Sensing Scheme with Magnetoresistance Boosted 4T-2M Bit-Cell.** *T. Shi*[1] and H. Cai[1] *1. Southeast University, Nanjing, China*

OPB-08. **Energy-Efficient STT-MRAM with Build-in-Self-Trimming After Test Writing Strategy.** *S. Liu*[1] and H. Cai[1] *1. Southeast University, Nanjing, China*

OPB-09. **MRAM-based spintronic physical unclonable function.** *J. Kang*[1], D. Han[1], D. Koh[1], S. Ko[1], K. Lee[4], J. Lee[3], C. Park[2], J. Ahn[2], M. Yu[2], M. Pakala[2], S. Lee[1], J. Park[4], K. Kim[1] and B. Park[1] *1. KAIST, Daejeon, The Republic of Korea; 2. Applied Materials, Santa Clara, CA, United States; 3. Hyundai Motor Company, Hwaseong, The Republic of Korea; 4. Korea University, Seoul, The Republic of Korea*

OPB-10. **PAC Code Construction for Spin-Torque Transfer Magnetic Random Access Memory.** B. Dai[1], Z. Mei[2], K. Cai[3], L. Kong[4] and *X. Zhong*[3] *1. Nanjing University of Posts and Telecommunications, Nanjing, China; 2. Nanjing University of Science and Technology, Nanjing, China; 3. Singapore University of Technology and Design, Singapore, Singapore; 4. Jinling Institute of Technology, Nanjing, China*

OPB-11. **Ultrathin free-standing spintronic device based on spin-orbit torque.** *M. Li*[1], X. Xu[1], C. Li[1], Z. Zhu[1], K. Meng[1] and Y. Jiang[2] *1. University of Science and Technology Beijing, Beijing, China; 2. Tiangong University, Tianjin, China*

OPB-12. **Nanoprobe based information processing: nanoprobe-electronics.** J. Hong[1,3], B. Yi[2], *X. Li*[2], R. Li[2] and L. You[2] *1. UC Berkeley, Berkeley, CA, United States; 2. Huazhong University of Science & Technology, Wuhan, China; 3. Hubei University of Technology, Wuhan, China*

ORAL SESSIONS

Session POA
HIGH FREQUENCY, MICROWAVE AND MILLIMETER WAVE MATERIALS AND DEVICES I

Nian Sun, Chair
Northeastern University, Boston, MA, United States

POA-01. **Angular Dependent Auto-Oscillations by Spin-Transfer and Spin-Orbit Torques in Magnetic Tunnel Junctions.** *W. Cai*[1], A. Kumar[2], A. Du[1], K. Shi[1], R. Xiao[1], K. Cao[1], J. Yin[1], J. Åkerman[2] and W. Zhao[1] *1. Fert Beijing Institute, MIIT Key Laboratory of Spintronics, School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China; 2. Department of Physics, University of Gothenburg, Gothenburg, Sweden*

POA-02. **Mutual Synchronization in Large Spin Hall Nano-Oscillator Chains.** *A. Kumar*[1], H. Fulara[2], R. Khymyn[1], M. Rajabali[1], X. Zhao[1], N. Behera[1], A. Awad[1] and J. Åkerman[1] *1. Physics Department, University of Gothenburg, Gothenburg, Sweden; 2. Physics, Indian Institute of Technology Roorkee, Roorkee, India*

POA-03. **Ultra-Fast Spectrum Analysis Using a Mutually Synchronized Chain of Spin Hall Nano-Oscillators.** P. Gupta[1], *A. Litvinenko*[2], A. Kumar[2], P.K. Muduli[1] and J. Åkerman[2] *1. Department of Physics, IIT Delhi, New Delhi, India; 2. Physics, University of Gothenburg, Gothenburg, Sweden*

POA-04. **A Compact and Integrated Magnetic Coupler Design with Crosscoupling Elimination Utilizing LCC-LCC/S Compensation Network for Building Attached Photovoltaic Systems.** *H. Wang*[1], J. Sun[1] and K. Cheng[1] *1. Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

POA-05. **Sub-harmonic resonance in spintronic diodes.** *A. Grimaldi*[1], E. Raimondo[1], A. Giordano[2], R. Tomasello[3], M. Carpentieri[3] and G. Finocchio[1] *1. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 2. Department of Engineering, University of Messina, Messina, Italy; 3. Department of Electrical and Information Engineering, Polytechnic of Bari, Bari, Italy*

POA-06. **Higher frequency permeability measurement by harmonic resonance cavity perturbation method.** *M. Yamaguchi*[1], Y. Miyazawa[1] and T. Miura[2] *1. New Industry Creation Hatchery Center, Tohoku University, Sendai, Japan; 2. The Müller Consultant, Suginami, Japan*

POA-07. **Optimization of Magnetic Coating for Improved Electromagnetic Wave Absorption in Bi-Layered Nano-Hollow Spheres.** *A. Gorai*[1] and K. Mandal[1] *1. Condensed Matter Physics and Material Sciences, Satyendra Nath Bose National Centre for Basic Sciences, Kolkata, India*

POA-08. **Evaluation of Noise Suppression Sheet Embedded in Printed Circuit Boards.** *K. Chata'ni*[1], T. Igarashi[1] and M. Ikeda[1] *1. TOKIN Corporation, Sendai, Japan*

POA-09. **Magnetic Properties of Soft Magnetic Powder/Epoxy Composite Sheet.** *H. Ooyama*[1,2], N. Kawada[2] and T. Sato[2] *1. Ajinomoto Fine-Techno Co., Inc., Kawasaki, Japan; 2. Shinshu University, Nagano, Japan*

POA-10. **Estimation of Material Characteristics of Film-Type Noise Suppressor Using Equivalent Circuit Modeling and Genetic Algorithm.** *T. Mikami*[1], S. Muroga[1] and M. Tanaka[1] *1. Akita University, Akita city, Japan*

POA-11. **High-Frequency Magnetic Properties of $Nd_2Fe_{17}N_3$ Magnetic Powders with Nano-α-Fe Phase-Separated Surface Layers.** *J. Akamatsu*[1], S. Abe[1] and N. Imaoka[1] *1. Magnet Material Development, Nichia Corporation, Anan, Japan*

POA-12. **High-Frequency Magnetic Properties of Novel Sm–Mo–Fe Phosphate-Coated Fe–*X* (*X* = Ni and Mn) Magnetic Powder Cores.** *R. Okazaki*[1], J. Nishitsuji[1], S. Abe[1], J. Akamatsu[1], N. Imaoka[1], M. Kume[1], Y. Kawakami[2], H. Hosokawa[2] and K. Ozaki[2] *1. Magnet Material Development, Nichia Corporation, Anan, Japan; 2. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

POA-13. **Microwave absorption properties of $Fe/Fe_{16}N_2$ nanoparticles prepared from iron oxide.** *S. Ajia*[1], M. Sato[1], M. Matsuura[1] and S. Sugimoto[1] *1. Tohoku University, Sendai, Japan*

POA-14. **Electromagnetic Field Analysis on Ringing Phenomenon of Inductor Driven by Inverter Considering Stray Capacitance.** *X. Hou*[1], K. Kawai[1], H. Dozono[1], K. Muramatsu[1], N. Ogishima[2], N. Thao[2], K. Fujisaki[2], Y. Gao[3], W. Guan[4], C. Tian[4], J. Yuan[4] and B. Chen[4] *1. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan; 2. Electromagnetic Energy System Laboratory, Toyota Technological Institute, Nagoya, Japan; 3. Division of Mechatronics, Oita University, Oita, Japan; 4. School of Electrical Engineering and Automation, Wuhan University, Wuhan, China*

POA-15. **Development of Millimeter-Wave Absorber Based on ε-Iron Oxide.** *A. Namai*[1], R. Kinugawa[1], M. Yoshikiyo[1] and S. Ohkoshi[1] *1. The University of Tokyo, Tokyo, Japan*

Session POB
MAGNETIC FIELD SENSORS (NON-RECORDING) I

Benjamin Spetzler, Chair
Technische Universität Ilmenau, Ilmenau, Germany

POB-01. **Development of Optically Pumped Magnetometers towards Next Generation Biomagnetic Neuroimaging.** ***(Invited)*** *T. Kobayashi*[1] *1. Open Innovation Institute, Kyoto University, Kyoto, Japan*

POB-02. **Spin-Dependent Photocarrier Generation Dynamics in Electrically Detected Nitrogen-Vacancy-Based Quantum Sensor.** *H. Morishita*[1,2], N. Morioka[3,4], T. Nishikawa[3], H. Yao[3], S. Onoda[5], H. Abe[5], T. Ohshima[5] and N. Mizuochi[3,4] *1. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 2. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Institute for Chemical Research, Kyoto University, Uji, Japan; 4. Center for Spintronics Research Network, Institute for Chemical Research, Kyoto University, Uji, Japan; 5. National Institutes for Quantum Science and Technology, Takasaki, Japan*

POB-03. **Magnetic tunnel junction sensors for linear positioning systems with nanoscale resolution.** *A. Talantsev*[1], E. Paz[1], T. Boehnert[1] and R. Ferreira[1] *1. Spintronics, International Iberian Nanotechnology Laboratory, Braga, Portugal*

POB-04. **Pulse Width Modulation Type Magnetoimpedance Sensor With Sub-mW Power Consumption.** *T. Uchiyama*[1] *1. Graduate School of Engineering, Nagoya University, Nagoya, Japan*

POB-05. **Symmetric resistance-field response and flux concentrator in tunnel magnetoresistance sensors for space applications.** S. Manceau[1,2], T. Brun[1,2], *J. Fischer*[1], C. Ducruet[3], P. Sabon[1], C. Cavoit[2], G. Jannet[2], I. Prejbeanu[1], M. Kretzschmar[2] and C. Baraduc[1] *1. CEA-SPINTEC, Grenoble, France; 2. LPC2E, Orléans, France; 3. Crocus Technology, Grenoble, France*

POB-06. **A Variable-Reluctance Based Wireless Sensing Module for Intraoral Pressure Measurement.** *M. Kohli*[1], C. Chen[1], L. Hsu[2,3], C.J. Yao[3] and T. Chung[1,4] *1. Department of Mechanical Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 2. Department of Dentistry, National Taiwan University Hospital Hsinchu Branch, Hsinchu, Taiwan; 3. Division of Orthodontics and Dentofacial Orthopedics, Dental Department, National Taiwan University Hospital, Taipei, Taipei, Taiwan; 4. International College of Semiconductor Technology, National Yang Ming Chiao Tung University, Hsinchu, Taiwan*

POB-07. **High Resolution Enlarged Open-Bore Narrow-Band Magnetic Particle Imaging Based on Double-Layer Linear Scanning Structure.** S. Bai[1], *T. Li*[1], K. Li[1], P. Huang[1], Z. Du[3], T. Yoshida[2] and M. Zhang[4] *1. Shenyang University of Technology, Shenyang, China; 2. Kyushu University, Fukuoka, Japan; 3. Zhengzhou University of Light Industry, Zhengzhou, China; 4. China Medical University, Shenyang, China*

POB-08. **Monotone Signal Localization Using Magnetoresistive Sensor Array for Low-Field Magnetic Particle Imaging.** *S. Trisnanto*[1], T. Kasajima[2], T. Shibuya[2] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. Technology and Intellectual Property HQ, TDK Corporation, Tokyo, Japan*

POB-09. **Feasibility Investigation on Sinusoidal-Reluctance Rotor Contour in Variable Reluctance Resolver.** *W. Mi*[1], J. Yu[1], Z. Cai[1], H. Zhao[2], F. Zhao[1] and Y. Luo[3] *1. School of Mechanical Engineering and Automation, Harbin Institute of Technology (Shenzhen), Shenzhen, China; 2. Robotics and Autonomous Systems Thrust, The Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China; 3. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China*

POB-10. **Comparison of Fractional and Integral Slot Winding Configurations on the Position Error for a Conventional Wound-Rotor Resolver.** *M. Onsal*[2], Y. Demir[2] and M. Aydin[1] *1. Kocaeli University, Kocaeli, Turkey; 2. MDS Motor Ltd., Kocaeli, Turkey*

POB-11. **Analysis of eddy current testing signals' frequency responses for conductivity-invariant crack sizing.** *W. Cheng*[1,2] *1. NDE Center, Japan Power Engineering and Inspection Corporation, Yokohama, Japan; 2. Department of Quantum Science and Energy Engineering, Tohoku University, Sendai, Japan*

Session POC
MAGNETIC FIELD SENSORS (NON-RECORDING) II

Lior Klein, Chair
Bar Ilan Institute of Nanotechnology and Advanced Materials, Ramat Gan, Israel

POC-01. **Magnetic Noise Theory for Magnetoelastic Magnetic Field Sensors.** *E. Spetzler*[1], B. Spetzler[2] and J. McCord[1] *1. Institute for Material Science, Kiel University, Kiel, Germany; 2. Department of Electrical Engineering and Information Technology, Technical University Ilmenau, Ilmenau, Germany*

POC-02. **Millimeter-Sized, Ultra-Sensitive Planar Hall Effect Gradiometer.** *H. Nhalil*[1], M. Schultz[1], S. Amrusi[2], A. Grosz[2] and L. Klein[1] *1. Department of Physics, Institute of Nanotechnology and Advanced Materials, Bar Ilan University, Ramatgan, Israel; 2. Department of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel*

POC-03. **Fabrication of GMR Sensors with Antiphase Magnetization Modulation and Closed-Loop Operation.** *K. Komuro*[1], D. Oshima[1] and T. Kato[2] *1. Electronics, Nagoya University, Nagoya, Japan; 2. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*

POC-04. **Low-Coercivity Perpendicular Spin Transfer Torque Magnetic Tunnel Junctions as Nanoscale Magnetic Sensors.** *H. Nicolas*[1], R. Sousa[2], A. Mora-Hernández[2], I. Prejbeanu[2], L. Hebrard[1], J. Kammerer[1] and J. Pascal[3,4] *1. University of Strasbourg, Strasbourg, France; 2. French Atomic Energy and Alternative Energies Commission, Grenoble, France; 3. University of Applied Sciences, Muttenz, Switzerland; 4. Swiss Nanoscience Institute, Basel, Switzerland*

POC-05. **Optimization of Synthetic Antiferromagnetic Structures for Angular Sensors Operating in Saturation.** *P. Araujo*[1,2], E. Paz[3], S. Cardoso[1,2], D. Leitao[4] and P. Freitas[1,3] *1. Instituto de Engenharia de Sistemas E Computadores – Microsistemas e Nanotecnologias (INESC MN), Lisboa, Portugal; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 3. International Iberian Nanotechnology Laboratory, Braga, Portugal; 4. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

POC-06. **Improved Detectivity in Tunnel Magnetoresistance Sensors by Controlling Free Layer Thickness and Annealing Process.** *M. Manikketh*[1], P.D. Kulkarni[1], T. Nakatani[1], H. Iwasaki[1], H. Suto[1] and Y. Sakuraba[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

POC-07. **Optimisation of Exchange Bias for Automotive Sensors.** *A. Carter*[1], S. Jaiswal[2], P. Campiglio[2], G. Vallejo Fernandez[1] and K. O'Grady[1] *1. School of Physics, Engineering and Technology, University of York, York, United Kingdom; 2. Allegro MicroSystems, Chavanod, France*

POC-08. **Spatial Resolution and Sensitivity of GMR Sensors with Magnetic Flux Concentrators Used for Magnetic Field Microscopes.** *A. Kikitsu*[1], Y. Higashi[1], Y. Kurosaki[1], S. Shirotori[1], K. Suzuki[2] and Y. Terui[2] *1. Toshiba Corporation, Kawasaki, Japan; 2. Toshiba Nanoanalysis, Yokohama, Japan*

POC-09. **A novel comb-shaped magnetoresistive sensor with magnetic flux concentrators for improved sensitivity.** *P.D. Kulkarni*[1], H. Iwasaki[1] and T. Nakatani[1] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

POC-10. **AC Magnetic Field Modulation on Tunnel Magnetoresistance Sensors with Even-Function Resistance-Field Response.** *T. Nakatani*[1], H. Suto[1], P.D. Kulkarni[1], H. Iwasaki[1] and Y. Sakuraba[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

POC-11. **Experimental assessment of the performances of an anisotropic magnetoresistive sensor after exposure to strong magnetic fields.** *C. Vergne*[2,1]*, H. Nicolas[2,3], M. Madec[3], S. Hemm[2], R. Guzman[1] and J. Pascal[2] *1. Biomedical Engineering, University of Basel, Basel, Switzerland; 2. Medical Engineering and Medical Informatics, University of Applied Sciences and Arts Northwestern, Muttenz, Switzerland; 3. ICube-CNRS, University of Strasbourg, Strasbourg, France*

POC-12. **Magnetic Hammer Testing with Tunnel Magnetoresistive Sensors.** *J. Ito*[1], M. Al-Mahdawi[2] and M. Oogane[1] *1. Applied Physics, Tohoku University, Sendai, Japan; 2. CSIS, Tohoku University, Sendai, Japan*

POSTER SESSION

Session PPA
APPLICATIONS TO "INTERNET OF THINGS" (IOT) (Poster Session)

Jeff McCord, Chair
Kiel University, Kiel, Germany

PPA-01. **Multiband Periodic Metamaterial Antenna Design for Radar Sensor Application.** *A. Eroglu*[1] and B. Chowdhury[1] *1. ECE, North Carolina A&T State U, Greensboro, NC, United States*

PPA-02. **An Inductive Power Transfer System with Multiple Receivers Utilizing Diverted Magnetic Field and Two Transmitters for IoT-level Automatic Catering Vehicles.** *H. Wang*[1], J. Sun[1] and K. Cheng[1] *1. Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

PPA-03. **Unbiased Random Number Generation Using Injection-Locked Spin-Torque Nano-Oscillators.** N. Phan[1], A. Sidi El Valli[1], N. Prasad[2,3], L. Anghel[1], A. Hakam[1], L. Benetti[4], A. Madhavan[2,5], A. Jenkins[4], R. Ferreira[4], M.D. Stiles[2], U. Ebels[1] and *P. Talatchian*[1] *1. SPINTEC, Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, Grenoble, France; 2. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Department of Chemistry and Biochemistry, University of Maryland, College Park, MD, United States; 4. International Iberian Nanotechnology Laboratory, Braga, Portugal; 5. Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, United States*

PPA-04. **Vehicle Detection Using 2-axis MI Sensors Based on Moving Vehicle Magnetic Field Simulation.** *R. Yao*[1] and T. Uchiyama[1] *1. Graduate School of Engineering, Nagoya University, Nagoya, Japan*

Session PPB
HIGH FREQUENCY, MICROWAVE AND MILLIMETER WAVE MATERIALS AND DEVICES II (Poster Session)

Parisa Andalib, Chair
Northeastern University, Boston, MA, United States

PPB-01. **Geometry Optimization of Split Ring Resonator for Terahertz Photon-Magnon Coupling.** *G. Baek*[1], J. Park[1] and K. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea*

PPB-02. **Design of a Fully Printed Implantable Rectenna.** Ú.d. Resende[1], *J.L. Soares*[1], S.T. Gonçalves[1] and I.V. Soares[2] *1. Electrical Engineering, CEFET-MG, Belo Horizonte, Brazil; 2. Institut d'Electronique at des Technologies du Numérique, Université de Rennes 1, Rennes, France*

PPB-03. **Application of Fe-based Alloy Powder to Noise Suppression Sheet for GHz-band.** *T. Igarashi*[1], A. Urata[1] and M. Chiba[1] *1. Advanced Materials R&D, TOKIN Corporation, Sendai, Japan*

PPB-04. **Magnetodielectric Material for VHF Antenna Devices Tunable by a Low DC Magnetic Field.** *A. Chevalier*[1], H. Breiss[1], A. Hoez[1] and J. Mattei[1] *1. Université de Bretagne Occidentale, Lab-STICC, UMR 6285, CNRS, Brest, France*

PPB-05. **Development of a Measurement System for AC Magnetization Process in Several MHz.** *H. Tanaka*[1], K. Mori[1], Y. Kanai[1], T. Mannen[1], T. Isobe[1], E. Kita[1] and H. Yanagihara[1] *1. University of Tsukuba, Tsukuba, Japan*

PPB-06. **Electromagnetic wave shielding with low reflection of FeCoNi coated on cellulose paper in GHz frequency range.** *R. Lamouri*[1], M. Gu[1], X. Su[1] and K. Kim[1] *1. Physics, Yeungnam University, Gyeongsan, The Republic of Korea*

PPB-07. **An estimation method of magnetic coupling coefficient between two microstrip lines using machine learning of near field information.** *Y. Sato*[1], S. Muroga[1], H. Kamozawa[1] and M. Tanaka[1] *1. Graduate School of Engineering Science, Akita University, Akita, Japan*

PPB-08. **Graphene-Based Micro-Rectenna.** Ú.d. Resende[1], *T.H. Mello*[1], G. Almeida[1] and S.T. Gonçalves[1] *1. Electric Engineering Department, Centro Federal de Educação Tecnológica de Minas Gerais, Belo Horizonte, Brazil*

PPB-09. **A study on high frequency characteristic and magnetic properties of various hexaferrites.** *M. Kim*[1], K. Park[1] and J. Kim[1] *1. Material Science and Chemical Engineering, Hanyang University, Ansan, The Republic of Korea*

PPB-10. **Millimeter Wave EMI Absorbing Materials Using Magnetic Loss of M-type Ferrites and Conductive Grid.** H. Lee[1], B. Park[1], S. Kwon[1], J. Choi[1], S. Lee[1], K. Kim[2], J. Kim[3] and *S. Lee*[1] *1. Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. Yeungnam University, Gyeongsan, The Republic of Korea; 3. Hanyang University, Ansan, The Republic of Korea*

PPB-11. **Preparation of Fe-B/epoxy composite films by the LbL-assisted composite plating method using epoxy-coated Fe-B fine particles.** *C. Masumoto*[1], Y. Kumauchi[1], A. Yokoi[2], W.K. Tan[2], H. Muto[2,1], Y. Endo[3] and N. Fujita[1,2] *1. National Institute of Technology, Nara College, Yamatokoriyama, Japan; 2. Toyohashi University of Technology, Toyohasi, Japan; 3. Tohoku University, Sendai, Japan*

PPB-12. **Microstructure of $Nd_2Fe_{17}N_3$ Magnetic Powder Surface with Nano-α-Fe Phases Separated Surface Layer.** *S. Abe*[1], J. Akamatsu[1] and N. Imaoka[1] *1. Magnet Material Development, Nichia Corporation, Anan, Japan*

PPB-13. **Conformally Conical Coil Design in Wireless Power Transfer for Emerging Unmanned Electric Vessels.** *H. Wang*[1] and K. Cheng[1] *1. Electrical Engineering, The Hong Kong Polytechnic University, Kowloon, Hong Kong*

PPB-14. **Analysis on New Electromagnetic Shielding Structure and Shielding Effectiveness of Electric Vehicle Wireless Charging System.** *L. Zhu*[1], Z. Tian[2], L. Zhu[2], X. Zhang[3] and Q. Yang[1] *1. School of Electrical Engineering and Automation, Tianjin University of Technology, Tianjin, China; 2. Department of Electrical Engineering, Tiangong University, Tianjin, China; 3. State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, Tianjin, China*

Session PPC
MAGNETIC FIELD SENSORS (NON-RECORDING) III (Poster Session)

Suko Bagus Trisnanto, Chair
Yokohama National University, Yokohama, Japan

PPC-01. **Wireless Inductive Displacement Sensor 3D Printed Using Additive Technology.** *M.G. Kisic*[1], K. Babković[1] and M. Damnjanović[1] *1. Department of Power, Electronic and Telecommunication Engineering, Faculty of Technical Sciences, University of Novi Sad, Novi Sad, Serbia*

PPC-02. **Detection of Metal Surface and Back Surface by Rectangular Wave Eddy Current Testing with Magneto Resistive Sensor.** *Z. Guo*[1] and T. Sasayama[1] *1. Department of Electrical and Electrical Engineering, Kyushu University, Fukuoka, Japan*

PPC-03. **Thickness Measurement of Nickel Plating on the Back Side Using a Combined Magnetic Field with AC of Two Different Frequencies.** *K. Kawada*[1], S. Mio[2] and Y. Gotoh[2] *1. Graduate School of Engineering, Oita University, Oita, Japan; 2. Department of Innovative Engineering, Faculty of Science and Technology, Oita University, Oita, Japan*

PPC-04. **Variable cross-section FeGa/quartz composite magnetic field sensor.** *D. Chen*[1], Y. Wen[1], X. Yang[1], P. Li[1] and Y. Wang[1] *1. Shanghai Jiaotong University, Shanghai, China*

PPC-05. **Dual Induction Eddy Current Probe for Vibration Noise Reduction.** *D. Kosaka*[1], Y. Kumakura[2] and F. Kojima[3] *1. Department of Electrical Engineering, Polytechnic University, Tokyo, Japan; 2. Tex Riken Co., Ltd., Nishinomiya-shi, Japan; 3. Kobe University, Kobe, Japan*

PPC-06. **Circumferential localization of a crack in cylindrical ferromagnetic rods based on the Fourier coefficients of the radial directional magnetic flux leakage.** *K. Shiku*[1], T. Nara[1] and Y. Gotoh[2] *1. Graduate School of Information Science and Technology, The University of Tokyo, Bunkyo-ku, Japan; 2. Innovative Engineering, Faculty of Science and Technology, Oita University, Oita, Japan*

PPC-07. **Examination of Thinning Inspection Method for Ferromagnetic Steel Tubes Using Velocity Effect of Static Magnetic Field.** *M. Tohara*[1] and Y. Gotoh[2] *1. Technical, Toa Non-Destructive Inspection Co., Ltd, Kitakyushu, Japan; 2. Oita University, Oita, Japan*

PPC-08. **An Analytical Model of an Eddy-Current Coil near the Edge of a Right-Angled Steel Wedge.** *X. Yang*[1], Y. Luo[1] and Y. Xiang[1] *1. Wuhan University, Wuhan, China*

PPC-09. **Realization of Different Anisotropy Direction for Each Thin-film Magnetoimpedance Elements on the Same Substrate.** *H. Kikuchi*[1], A. Ueno[1] and M. Tanii[1] *1. Iwate University, Morioka, Japan*

PPC-10. **Development of a flexible sensor focusing on the excitation and search characteristics of planar coils.** *S. Yoshioka*[1] and S. Yamamura[1] *1. National Institute of Technology (KOSEN), Toba College, Mie, Japan*

PPC-11. **Frequency Characteristics Analysis of Remote Field Eddy Current Testing on Ferromagnetic Pipes.** *K. Komatsubara*[1], Y. Gao[1], Y. Gotoh[1], W. Guan[2] and K. Muramatsu[3] *1. Division of Mechatronics, Oita University, Oita, Japan; 2. Wuhan University, Wuhan, China; 3. Department of Electrical and Electronic Engineering, Saga University, Saga, Japan*

PPC-12. **Estimation of Anomalous Portion in Gray Cast Iron Using Non-Contacting Electromagnetic Sensor.** *S. Mio*[1], K. Kawada[2], Y. Okumura[3] and Y. Gotoh[1] *1. Department of Innovative Engineering, Faculty of Science and Technology, Oita University, Oita, Japan; 2. Graduate School of Engineering, Oita University, Oita, Japan; 3. Research & Development Headquarters Materials & Castings Center Materials Analysis & Evaluation Team, KUBOTA Corporation, Sakai, Japan*

PPC-13. **Non-contact measurement method for shrinkage cavity in spheroidal graphite cast iron using electromagnetic force vibration.** *S. Niwa*[1], S. Shiota[1], K. Fujimoto[2], Y. Gao[2] and Y. Gotoh[2] *1. Graduate School of Engineering, Oita University, Oita City, Japan; 2. Faculty of Science and Technology, Oita University, Oita City, Japan*

PPC-14. **A Contactless Eddy Current Inductive Position Sensor with 4-Phase Rotor for Angular Displacement Detection.** *G. Ma*[1], S. Fang[1], F. Zeng[2] and D. Xu[1] *1. Shanghai University, Shanghai, China; 2. Shanghai Zhiqu Technology Co., LTD, Shanghai, China*

PPC-15. **Magnetic Field Detection of Coplanar Line Type Thin Film Magnetic Field Sensor with Optimized Narrow Slits.** *R. Suzuki*[1], M. Sakamoto[1], T. Ishihara[1], J. Honda[1] and S. Yabukami[1] *1. Engineering, Tohoku University, Sendai, Japan*

Session PPD
SENSORS (NOT OF MAGNETIC FIELDS) (Poster Session)

Tomoya Nakatani, Chair
National Institute for Materials Science, Tsukuba, Japan

PPD-01. **Detection of a high frequency magnetic field using frequency mixing technique in the FM-OFG.** *I. Sasada*[1] *1. Sasada Magnetics and Sensors Laboratory, Fukuoka, Japan*

PPD-02. **Magnetic Relaxation Effects on Magnetoelastic Resonance Sensors.** B. Sisniega Soriano[1], *J. Gutiérrez*[1,2], J. Barandiaran[1] and A. García-Arribas[1,2] *1. Electricidad y Electrónica, Universidad del País Vasco (UPV/EHU), Leioa, Spain; 2. BCMaterials, Leioa, Spain*

PPD-03. **A sub-micrometric spintronic-based accelerometer.** A. Meo[1], F. Garescì[2], D. Rodrigues[1], E. Raimondo[3], V. Puliafito[1], V. Lopez-Dominguez[4], P. Khalili[4], M. Carpentieri[1] and *G. Finocchio*[3] *1. Department of Electrical and Information Engineering, Politecnico of Bari, Bari, Italy; 2. Department of Engineering, University of Messina, Messina, Italy; 3. Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, Messina, Italy; 4. Department of Electrical and Computer Engineering, Northwestern University, Evanston, IL, United States*

PPD-04. **Design of micro-defect detection system for lithium battery lug welding seam.** M.T. Li[1], *B. Shi*[1], X. Yue[1], P. Huang[1], X. Zhang[1] and Z. Liu[1] *1. School of Information Science and Engineering, Shenyang University of Technology, Shenyang, China*

PPD-05. **Vibration-Based Heartbeat Detection Using a Magnetic Sensor.** *H. Shen*[1,2], X. Gu[1] and Y. Wu[1] *1. Electrical and Computer Engineering, National University of Singapore, Singapore; 2. National University of Singapore (Chong Qing) Research Institute, Chongqing, China*

PPD-06. **Resonance-Based Detection of Magnetic Nanoparticles Using Microfluidic Devices with Ferromagnetic Nanostructures.** R.L. Dowling[1], R. Narkowicz[2], K. Lenz[2], T. Schefer[1], J. Lindner[2] and *M. Kostylev*[1] *1. Physics, University of Western Australia, Crawley, WA, Australia; 2. Institute for Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

PPD-07. **Magnetization State and Magnetic Structure of Wiegand Wire Evaluated by External Magnetic Field Measurement.** *G. Sha*[1,2], Y. Kita[1], H. Shigeta[1], T. Nakamura[1], C. Yang[2], Z. Song[2] and Y. Takemura[1] *1. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan; 2. School of Transportation Engineering, Nanjing Vocational University of Industry Technology, Nanjing, China*

PPD-08. **Long Base-Line Axial Gradiometer Based on the Fundamental Mode Orthogonal Fluxgate.** *I. Sasada*[1] *1. Sasada Magnetics and Sensors Laboratory, Fukuoka, Japan*

PPD-09. **Evaluation of Electrical Conduction Property at Conductive Shield Layer to Improve Performance of Magnetically Shielded Rooms.** *S. Odawara*[1], M. Sakakibara[1], K. Yoshimura[2] and Y. Gotoh[2] *1. Ohtama Co., Ltd., Inagi Tokyo, Japan; 2. Innovative Engineering, Faculty of Science and Technology, Oita University, Oita, Japan*

ORAL SESSIONS

Session QOA
MAGNETO-OPTIC, MAGNETOELASTIC AND MAGNETOCALORIC MATERIALS I

Lei Bi, Chair
University of Electronic Science and Technology of China, Chengdu, China

QOA-01. **RF Signal Processing with Magneto-Acoustic Devices.** ***(Invited)*** *P. Dhagat*[1], V. Gokhale[2], A. Jander[1], B. Downey[2], C. Rivard[1], S. Mack[2], D. Katzer[2], J. Roussos[2] and D. Meyer[2] *1. School of Electrical Engineering and Computer Science, Oregon State University, Corvallis, OR, United States; 2. Electronics Science and Technology Division, US Naval Research Laboratory, Washington, DC, United States*

QOA-02. **Magnetoelastic transducers for spin-wave generation.** *D. Narducci*[1,2], F. Ciubotaru[1], M. Geilen[3], J. Balliet[3], G. Talmelli[1,4], F. Vanderveken[1,4], B. Heinz[3], B. Hillebrands[3], J. De Boeck[1,2], I. Asselberghs[1], G. Kar[1], P. Pirro[3], S. Couet[1] and C. Adelmann[1] *1. Imec, Leuven, Belgium; 2. Department of Electrical Engineering, ESAT, KU Leuven, Leuven, Belgium; 3. TU Kaiserslautern, Kaiserslautern, Germany; 4. Department of Material Engineering, MTM, KU Leuven, Leuven, Belgium*

QOA-03. **Magnetic tunable SAW based piezo-resonator for low magnetic field sensing application.** *P. Kumar*[1] and P. Kaur[1] *1. Physics, Indian Institute of Technology, Roorkee, India*

QOA-04. **Machine-learning-accelerated design of high-efficiency corrosion inhibitor for magnetic refrigeration.** Q. Zhao[1], K. Yan[1], K. Qiao[1], D. Zhang[1], H. Luo[1], X. Zheng[1] and *H. Zhang*[1] *1. University of Science and Technology Beijing, Beijing, China*

QOA-05. **Modifying magnetic interactions and hysteresis by introducing Mn in La(Fe,Si)$_{13}$.** *B. Eggert*[1], J. Lill[1], C. Pillich[1], A. Terwey[1], K. Skokov[2], F. Wilhelm[3], A. Rogalev[3], K. Ollefs[1], O. Gutfleisch[2], M. Gruner[1] and H. Wende[1] *1. Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Duisburg, Germany; 2. Functional Materials, Department of Material Science, TU Darmstadt, Darmstadt, Germany; 3. European Synchrotron Radiation Facility, Grenoble, France*

QOA-06. **Development of Magnetic Refrigeration Materials for Hydrogen Liquefaction Applications.** *H. Sepehri-Amin*[1], X. Tang[1], A. Bolyachkin[1], J. Lai[1], E. Dengina[1], N. Terada[1], T. Ohkubo[1] and K. Hono[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

QOA-07. **Giant magnetocaloric effects of 2nd order phase transition utilized for liquefaction of hydrogen near 20 K.** *W. Liu*[1], K. Skokov[1], T. Gottschall[2], A. Aubert[1], F. Scheibel[1] and O. Gutfleisch[1] *1. Materials Science, TU Darmstadt, Darmstadt, Germany; 2. Dresden High Magnetic Field Laboratory, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

QOA-08. **Novel magnetocaloric composites with outstanding thermal conductivity and mechanical properties boosted by continuous Cu networks.** *X. Miao*[1], C. Wang[1], T. Liao[2], S. Ju[2], J. Zha[1], W. Wang[1], F. Xu[1] and L. Caron[3] *1. Nanjing University of Science and Technology, Nanjing, China; 2. Shanghai Jiao Tong University, Shanghai, China; 3. Bielefeld University, Bielefeld, Germany*

QOA-09. **Dissipation losses limiting first-order phase transition materials in cryogenic caloric cooling: A case study on all-d-metal Ni(-Co)-Mn-Ti Heusler alloys.** *B. Beckmann*[1]*, D. Koch[1], L. Pfeuffer[1], T. Gottschall[2], A. Taubel[1], E. Adabifiroozjaei[1], O. Miroshkina[3], S. Riegg[1], T. Niehoff[2], N. Kani[1], M. Gruner[3], L. Molina-Luna[1], K. Skokov[1] and O. Gutfleisch[1] *1. Institute of Materials Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Dresden High Magnetic Field Laboratory, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. Faculty of Physics and Center for Nanointegration Duisburg-Essen, University of Duisburg-Essen, Duisburg, Germany*

QOA-10. **Magnetic Properties of Co_2MnSi-Based Heusler Alloy Glass-Coated Microwires.** M. Salaheldeen[1,2], V. Zhukova[1,3], P. Corte-Leon[1,3], M. Ipatov[4,5] and *A. Zhukov*[6,3] *1. Dept. Polym. and Advanced Mater. and Dept. Appl. Phys., Universidad del País Vasco, San Sebastian, Spain; 2. Physics Department, Faculty of Science, Sohag University, Sohag, Egypt; 3. EHU Quantum Center, Universidad del Pais Vasco, San Sebastian, Spain; 4. Dept. Polym. and Advanced Mater, Universidad del Pais Vasco, San Sebastian, Spain; 5. Dept. Appl. Phys., Universidad del Pais Vasco, San Sebastian, Spain; 6. Dept. Polym. and Advanced Mater. and Dept. Appl. Phys., Universidad del Pais Vasco and Ikerbasque, San Sebastian, Spain*

QOA-11. **Giant Magnetocaloric Effect by Low Magnetic Field Metamagnetic Transition in $Eu_4Ga_8Ge_{16}$ Compound.** *S. Cha*[1], P. Rawat[1], J. Kim[1], J. Yun[1] and J. Rhyee[1] *1. Physics, Kyung Hee University, Yongin-si, The Republic of Korea*

QOA-12. **Large low field magnetocaloric effect in Laves phase intermetallic compounds $R'_{0.33}Ho_{0.33}Er_{0.33}Al_2$ (R′ = Gd, Tb and Dy) and $Gd_{0.33}Dy_{0.33}Ho_{0.33}Al_2$.** *P. Jesla*[1], A. Chelvane[2] and R. Nirmala[1] *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. Defence Metallurgical Research Laboratory, Hyderabad, India*

Session QOB
MAGNETO-OPTIC, MAGNETOELASTIC AND MAGNETOCALORIC MATERIALS II

Lei Bi, Chair
University of Electronic Science and Technology of China, Chengdu, China

QOB-01. **Under pressure: probing the magnetoelastic coupling in magnetocaloric materials.** ***(Invited)*** *L. Caron*[1,2] *1. Faculty of Physics, Bielefeld University, Bielefeld, Germany; 2. Helmholtz-Zentrum Berlin, Berlin, Germany*

QOB-02. **Magnetooptics of higher order in magnetization.** ***(Invited)*** *J. Hamrle*[1] *1. Institute of Physics, Charles University in Prague, Prague, Czechia*

QOB-03. **NV Center-Coupled Magnetoelastic Waves: Modelling and Experiment.** *A. Jung*[1], S. Margueron[2], A. Bartasyte[2,3] and S. Salahuddin[1] *1. EECS, University of California, Berkeley, Berkeley, CA, United States; 2. FEMTO-ST Institute, University of Bourgogne Franche-Comte, Besancon, France; 3. Institut Universitaire de France, Bescanon, France*

QOB-04. **Withdrawn**

QOB-05. **Design of Microscale Magnetic Controls for Magnetic-Field Driven Actuation.** *L. Cestarollo*[1]*, R. Cantu[2], K. Srinivasan[3] and A. El-Ghazaly[3] *1. Materials Science and Engineering, Cornell University, Ithaca, NY, United States; 2. Mechanical Engineering, The University of Texas at Austin, Austin, TX, United States; 3. Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States*

QOB-06. **Efficient Modeling of Magneto-Elastic Media Using the Feedback Preisach Model.** *A.A. Adly*[1,2] *1. Elect. Power Engineering Dept., Cairo University, Giza, Egypt; 2. Egypt-Japan University of Science and Technology (E-JUST), New Borg El-Arab, Egypt*

QOB-07. **Temperature Dependence of Magnetic Anisotropy and Domain Wall Width Tuning in a $BaTiO_3$(111)/CoFeB Heterostructure.** R. Hunt[1], K.J. Franke[1], P.S. Keatley[2], P. Shepley[1] and *T.A. Moore*[1] *1. University of Leeds, Leeds, United Kingdom; 2. University of Exeter, Exeter, United Kingdom*

QOB-08. **Magnetostrictive Properties of Fe-Based Nanocrystalline Soft Magnetic Alloys with Ga Addition.** *K. Sano*[1], T. Yamazaki[2], C. Oka[1], J. Sakurai[1] and S. Hata[1] *1. Department of Micro-Nano Systems Engineering, Nagoya University, Chikusa-ku, Nagoya, Japan; 2. Department of Materials Science and Technology, Tokyo University of Science, Katsushika-ku, Japan*

QOB-09. **Characterization and multiscale modeling of the magneto-elastic behavior of Galfenol.** M. Domenjoud[2], A. Pecheux[2,3] and *L. Daniel*[1] *1. GeePs, Centralesupelec, Gif-sur-Yvette, France; 2. GeePs, University Paris-Saclay, Gif-sur-Yvette, France; 3. SATIE, ENS Paris-Saclay, Gif-sur-Yvette, France*

QOB-10. **Development of Magneto-Optical Diffractive Deep Neural Network.** *H. Sakaguchi*[1], T. Fujita[1], J. Zhang[1], S. Sumi[2], H. Awano[2], H. Nonaka[3] and T. Ishibashi[1] *1. Nagaoka University of Technology, Nagaoka, Japan; 2. Toyota Technological Institute, Toyota, Japan; 3. Aichi Institute of Technology, Toyota, Japan*

QOB-11. **Faraday effects of magneto-dielectric nanogranular films with various particle shape.** *H. Kijima-Aoki*[1,2], K. Ikeda[3], N. Kobayashi[3], M. Ohnuma[4], Y. Honda[4] and H. Masumoto[2] *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 3. Research Institute for Electromagnetic Materials, Tomiya, Japan; 4. Faculty of Engineering, Hokkaido University, Sapporo, Japan*

QOB-12. **Broadband Integrated Magneto-Optical Isolators on Silicon Nitride Platforms.** *W. Yan*[1], D. Wu[1], Y. Yang[1], Z. Wei[1], J. Qin[1], L. Deng[1] and L. Bi[1] *1. University of Electronic Science and Technology of China, Chengdu, China*

QOB-13. **Magnetooptical properties of Ce:YIG annealed by laser in a vacuum.** H. Miyashita[1,2], Y. Yoshihara[1,2], T. Koguchi[1,2], K. Mori[1], P. Lim[2], M. Inoue[1], K. Ishiyama[1] and *T. Goto*[1] *1. Tohoku University, Sendai, Japan; 2. Toyohashi University of Technology, Toyohashi, Japan*

POSTER SESSION

Session QPA
MAGNETOCALORIC MATERIALS (Poster Session)

Nicola Morley, Chair
University of Sheffield, Sheffield, United Kingdom

QPA-01. **Magnetic and magnetocaloric properties of arc-melted and melt-spun Laves phase intermetallic compound $TbNi_{1.5}Fe_{0.5}$.** *M.M. Prusty*[1], K. Tejaswi[1], A. Chelvane[2] and R. Nirmala[1] *1. Physics, Indian Institute of Technology Madras, Chennai, India; 2. Defence Metallurgical Research Laboratory, Hyderabad, India*

QPA-02. **Withdrawn**

QPA-03. **Method of measuring thermal conductivity in a thin Co film.** *K. Tanabe*[1], A. Yagmur[1,2] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan; 2. University of Leeds, Leeds, United Kingdom*

QPA-04. **First Order Magnetic Transition and Magnetocaloric Properties of $Pr_{0.48}Sr_{0.52}MnO_3$: A Charge Ordered Perovskite.** A.K. Saw[1], J.P. Nunez[2], R.L. Hadimani[2] and *V. Dayal*[1] *1. Department of Physics, Maharaja Institute of Technology-Mysore, Mandya, India; 2. Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*

QPA-05. **Reactive single-step hot-pressing and magnetocaloric performance of polycrystalline $Fe_2Al_{1.15-x}B_2Ge_xGa_x$ (x = 0, 0.05) MAB phases.** *B. Beckmann*[1], T. El-Melegy[2], D. Koch[1], U. Wiedwald[3], M. Farle[3], F. Maccari[1], J. Snyder[2], K. Skokov[1], M. Barsoum[2] and O. Gutfleisch[1] *1. Institute of Materials Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, United States; 3. Faculty of Physics and Center for Nanointegration Duisburg-Essen, University Duisburg-Essen, Duisburg, Germany*

QPA-06. **Fabrication and magneto-structural characterization of $Ni_{41.7}Mn_{47.8}Sn_{10.6}$ glass-coated microwires.** *M.d. Arreguin Hernandez*[1,2], M. Varga[2,3], A. Dzubinska[2], M. Reiffers[4], T. Ryba[5], J.L. Sanchez Llamazares[1,6] and R. Varga[2,5] *1. Instituto Potosino de Invetigacion Cietifica y Tecnologica, San Luis Potosí, Mexico; 2. CPM-TIP, Kosice, Slovakia; 3. UPJS, Kosice, Slovakia; 4. University of Presov, Presov, Slovakia; 5. RVmagnetic, Kosice, Slovakia; 6. Universidad de Oviedo, Oviedo, Spain*

QPA-07. **Large Magnetocaloric Effect of PrNi Compound at Liquid-hydrogen Temperatures.** Y. Gao[1], X. Zheng[1], *H. Zhang*[1], D. Wang[1,2], B. Jin[1], H. Liu[1], S. Zhen[1], J. Gao[1], Y. Pan[1], L. Xi[3], S. Wang[1,3] and B. Shen[2] *1. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; 2. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences and University of Chinese Academy of Sciences, Beijing, China; 3. School of Materials Science and Engineering, Anhui University, Hefei, China*

QPA-08. **Electronic Structure and Interatomic Exchange Interactions in Magnetocaloric $LaFe_{13-X}Si_X$ Alloys.** *A.P. Kamantsev*[1], A.V. Golovchan[1,2] and O.E. Kovalev[1,2] *1. Kotelnikov IRE RAS, Moscow, Russian Federation; 2. Galkin DonIPE, Donetsk, Russian Federation*

QPA-09. **Entropy change and the magnetocaloric effect in R_2Cu_2Cd.** *J. Caro Patiño*[1] and N. Antunes de Oliveira[1] *1. Instituto de Física, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil*

QPA-10. **Withdrawn**

QPA-11. **Martensite transition and room temperature magnetocaloric effect in Ag doped $Ni_{50}Mn_{37}In_{13}$ alloy.** *S. Sakthivel*[1], K. Arun[1], U. Remya[1], S. Athul[1], A. Dzubinska[2], M. Reiffers[3] and R. Nagalakshmi[1] *1. Physics, National Institute of Technology Tiruchirappalli, Tiruchirappalli, India; 2. Center for Progressive Materials-Technology and Innovation Park, University Pavol Josef Safarik, Kosice, Slovakia; 3. Faculty of Humanities and Natural Sciences, Presov University, Presov, Slovakia*

QPA-12. **Tailoring thermal hysteresis and microstructure of Ni-Mn-based Heusler alloys for multicaloric cooling applications.** *A. Taubel*[1], L. Pfeuffer[1], F. Scheibel[1], N. Shayanfar[1], B. Beckmann[1], T. Gottschall[2], K. Skokov[1] and O. Gutfleisch[1] *1. Material Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Dresden High Magnetic Field Laboratory, Helmholtz-Zentrum Dresden Rossendorf, Dresden, Germany*

QPA-13. **Withdrawn**

QPA-14. **Study the Optimal Duty Cycle of a Coaxial Magnet for a Rotary Type Magnetic Refrigerator.** *C. Lee*[1], P. Cheng[1], K. Leou[1], C. Hsieh[1] and Y. Su[1] *1. Department of Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan*

QPA-15. **Electronic Structure and Curie Temperature Change in Ti or Al Doped GdFeSi Compound.** *R.D. Mukhachev*[1], A. Lukoyanov[1,2], S. Platonov[1], A. Kuchin[1], A. Volegov[2,1], V. Gaviko[1,2] and M. Yakovleva[1] *1. M.N. Miheev Institute of Metal Physics UB of RAS, Yekaterinburg, Russian Federation; 2. Ural Federal University named after B.N. Yeltsin, Yekaterinburg, Russian Federation*

POSTER SESSION

Session QPB
MAGNETO-OPTIC, MAGNETOELASTIC AND MAGNETOCALORIC MATERIALS III (Poster Session)

Taichi Goto, Co-Chair
Tohoku University, Sendai, Japan
Chen Zhang, Co-Chair
Wuhan University, Wuhan, China

QPB-01. **Crystal and Magnetooptical Properties of 2 μm Thick Ce:YIG Grown on GGG substrate.** *Y. Yoshihara*[1,2], T. Koguchi[1,2], K. Mori[1], H. Miyashita[1,2], P. Lim[2], M. Inoue[1], K. Ishiyama[1] and T. Goto[1] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Toyohashi University of Technology, Toyohashi, Japan*

QPB-02. **Realization of large magneto-optical effect by diagonal permittivity change in epsilon-near-zero materials.** *K. Ikeda*[1], T. Liu[2], Y. Ota[3], S. Iwamoto[4,5] and N. Kobayashi[1] *1. Research Institute for Electromagnetic Materials, Tomiya, Japan; 2. Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Jilin, China; 3. Department of Applied Physics and Physico-Informatics, Keio University, Yokohama, Japan; 4. Research Center for Advanced Science and Technology, The University of Tokyo, Tokyo, Japan; 5. Institute for Nano Quantum Information Electronics and Institute of Industrial Science, The University of Tokyo, Tokyo, Japan*

QPB-03. **Development of an Optical Probe Current Sensor for Local and Narrow Area Measurement Using Magnetic Domain Reversal in Bi-Substituted Rare-Earth Iron Garnet Crystal.** *S. Sue*[1,2], M. Miyamoto[1], T. Kubo[1], M. Sonehara[2] and T. Sato[2] *1. Research and Development Department, CITIZEN FINEDEVICE, Mityota, Japan; 2. Spin Device Technology Center, Shinshu University, Nagano, Japan*

QPB-04. **Boron-induced magneto-optical Kerr spectra and dielectric tensors in ferrimagnetic antiperovskite thin films.** H. Sakaguchi[1], *S. Isogami*[2], M. Niimi[1] and T. Ishibashi[2] *1. Nagaoka University of Technology, Nagaoka, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

QPB-05. **Withdrawn**

QPB-06. **Evaluation of magnetic flux density change for vibration energy harvesting: comparison between direct and indirect measurements.** *T. Okada*[1], S. Fujieda[1], S. Seino[1] and T. Nakagawa[1] *1. Graduate School of Engineering, Osaka University, Suita, Japan*

QPB-07. **Characterization of the Magnetostrictive and Elastic Properties of Polycrystalline $Co_{70}Fe_{30}$ Alloy.** *M. Watanabe*[1], K. Urakawa[1], T. Kida[1], M. Kasuya[2], M. Chiba[3], K. Kanie[3], T. Tanno[4], M. Abe[4], S. Hashi[5], K. Ishiyama[4] and S. Suzuki[6] *1. Tohoku Steel Co.,Ltd., Murata-machi, Japan; 2. Faculty of Production Systems Engineering and Sciences, Komatsu University, Komatsu, Japan; 3. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 4. Research Institute for Electrical Communication, Tohoku University, Sendai, Japan; 5. Faculty of Engineering, Tohoku Gakuin University, Sendai, Japan; 6. Micro System Integration Center, Tohoku University, Sendai, Japan*

QPB-08. **Toward quantitative evaluation of coupling between Kittel mode and surface acoustic wave resonator mode.** *H. Komiyama*[1], K. Taga[1], R. Hisatomi[1], Y. Shiota[1], T. Moriyama[1] and T. Ono[1] *1. Kyoto University, Uji, Japan*

QPB-09. **Application of various materials with negative saturation magnetostriction to vibration power generation.** *T. Sugiyama*[1], T. Okada[1], S. Fujieda[1], S. Seino[1], T. Nakagawa[1], Y. Ohishi[1] and H. Muta[1] *1. Osaka University, Suita, Japan*

QPB-10. **Study on Magnetic Properties of La-doped Fe-Ga Polycrystalline Films.** *R. Nishina*[1], T. Miyazaki[1] and Y. Endo[2,3] *1. Faculty of Engineering, Tohoku University, Sendai, Japan; 2. Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

QPB-11. **Thermo-elastic Martensitic transformation in off-stoichiometric $Co_2Fe_{0.5}Ti_{0.5}Si$ quaternary Heusler alloy thin films.** *M. Rahaman*[1], L.A. Longchar[1], R. Joshi[2], R. Rawat[2], M. Raja[3], S.N. Kaul[1] and S. S[1] *1. School of Physics, University of Hyderabad, Hyderabad, India; 2. UGC - DAE Consortium for Scientific Research, Indore, India; 3. Advanced Magnetics Group, Defence Metallurgical Research Laboratory, Hyderabad, India*

QPB-12. **Chemical order, unit cell volume, and spontaneous magnetization in vapor-quenched single crystalline $Fe_{0.6}Al_{0.4}$ alloy thin film.** *K. Toyoki*[1], D. Kitaguchi[1], Y. Shiratsuchi[1] and R. Nakatani[1] *1. Osaka University, Suita, Japan*

QPB-13. **Origin of Griffiths phase in nanocrystalline $La_{0.4}(Ca_{0.5}Sr_{0.5})_{0.6}MnO_3$.** *S. Saha*[1], S. Bandyopadhyay[2] and I. Das[1] *1. Condensed Matter Physics, Saha Institute of Nuclear Physics, Kolkata, India; 2. Department of Physics, University of Calcutta, Kolkata, India*

QPB-14. **Giant magnetocaloric effect in 2D transition-metal hydroxide nanosheets.** *P. Joshi*[1], J. Mohapatra[1] and P. Liu[1] *1. Department of Physics, University of Texas at Arlington, Arlington, TX, United States*

QPB-15. **The Role of Heat Capacity Anomaly on the Magnetocaloric Effect.** *A. Kosogor*[1,2] and V.A. L'vov[1,3] *1. Institute of Magnetism NASU and MESU, Kyiv, Ukraine; 2. Faculty of Physics, University of Vienna, Vienna, Austria; 3. Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

ORAL SESSIONS

Session ROA
MAGNETOELECTRONIC MATERIALS AND PHENOMENA I

Oleksandr Pylypovskyi, Chair
Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

ROA-01. **Spin pumping with heavy metals, topological insulators and antiferromagnets.** ***(Invited)*** *S. Bedanta*[1] *1. Physics, National Institute of Science Education and Research, Jatni, India*

ROA-02. **Microscopic origin behind the magnetic anisotropy modulation in the multiferroic composites.** *A.M. Yatmeidhy*[1] and Y. Gohda[1] *1. Tokyo Institute of Technology, Yokohama, Japan*

ROA-03. **Control of Exchange Bias in HfO_2/Co via Magneto-ionic Motion.** *E. Niapos*[1], J.A. Arregi[1], L. Čelko[1], V. Uhlir[1], E. Menéndez[2] and J. Sort[2,3] *1. CEITEC BUT Brno University of Technology, Brno, Czechia; 2. Department of Physics, Universitat Autonoma de Barcelona, Barcelona, Spain; 3. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain*

ROA-04. **Magnetic Properties of Magnetoelectric Nanoparticles with Varying Core-Shell Ratios and Their Effects on In Vitro Neuron Stimulation.** *S. Chen*[1], E. Zhang[2], B. Navarrete[2], Y. Akin[2], M. Abdel-Mottaleb[3], M. Alberteris Campos[2], I. Smith[3], P. Liang[4] and S. Khizroev[2] *1. Chemical, Environmental, and Materials Engineering, University of Miami, Coral Gables, FL, United States; 2. Electrical and Computer Engineering, University of Miami, Coral Gables, FL, United States; 3. Biomedical Engineering, University of Miami, Coral Gables, FL, United States; 4. Cellular Nanomed Inc, Irvine, CA, United States*

ROA-05. ***Operando* XMCD and EXAFS spectroscopies for orbital control by reversible strain at Co_2FeSi/PMN-PT interface.** *J. Okabayashi*[1], T. Usami[2], A.M. Yatmeidhy[3], Y. Gohda[3] and K. Hamaya[2] *1. UTokyo, Tokyo, Japan; 2. Osaka University, Osaka, Japan; 3. Tokyo Institute of Technology, Yokohama, Japan*

ROA-06. **Growth and magnetoelectric effect of epitaxial Co_3Mn films on piezoelectric $Pb(Mg_{1/3}Nb_{2/3})O_3$-$PbTiO_3$(001).** *Y. Murakami*[1], T. Usami[2], Y. Shiratsuchi[3,2], Y. Sanada[1], S. Yamada[2,4], R. Nakatani[3,2] and K. Hamaya[2,4] *1. Department of Systems Innovation, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 3. Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, Suita, Japan; 4. Spintronics Research Network Division, Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan*

ROA-07. **Mechanical, electrical and optical control of magnetization reversals and spin dynamics in extrinsic multiferroics.** M. Liparo[1,2], J. Jay[1], M. Dubreuil[1], A. Fessant[1], W. Jahjah[1], Y. Le Grand[1], C. Sheppard[2], A. Prinsloo[2], B. Warot-Fonrose[3], G. Simon[4], V. Vlaminck[5], V.M. Castel[5], L. Temdie-Kom[5], G. Bourcin[5], D. Spenato[1] and *D.T. Dekadjevi*[1,2] *1. Physics, Laboratoire OPTIMAG - Universite de Bretagne Occidentale, Brest, France; 2. Cr Research Group, Physics, University of Johannesburg, Johannesburg, South Africa; 3. CEMES CNRS-UPR 8011 Université de Toulouse, Toulouse, France; 4. Univ. of Brest, Service Général des Plateformes Technologiques, Service RMN-RPE, Brest, France; 5. IMT-Atlantique, Campus de Brest, Département Micro-Ondes, Technopole Brest-Iroise, Brest, France*

Session ROB
MAGNETOELECTRONIC MATERIALS AND PHENOMENA II

Subhankar Bedanta, Chair
NISER, Bhubaneswar, Jatani, India

ROB-01. **Magnetic domains and flexomagnetism in Cr_2O_3. *(Invited)*** *O. Pylypovskyi*[1,2] *1. Helmholtz-Zentrum Dresden-Rossendorf e.V., Dresden, Germany; 2. Kyiv Academic University, Kyiv, Ukraine*

ROB-02. **Enhancement of multiferroic properties for $BiFeO_3$ films with Tb substitution.** *T. Lin*[1], H.W. Chang[2], C. Wang[3], D. Wei[1], C. Tu[4,5] and P. Chen[5] *1. National Taipei University of Technology, Taichung, Taiwan; 2. National Chung Cheng University, Chia-Yi, Taiwan; 3. Tunghai University, Taichung, Taiwan; 4. Fu Jen Catholic University, Taipei, Taiwan; 5. Ming Chi University of Technology, New Taipei City, Taiwan*

ROB-03. **Development of $BiFeO_3$-Based Multiferroic Thin Films with Excellent Magnetic Properties and Investigation of Their Etching Resistance for Magnetic Nano Device Applications.** *S. Ratha*[1], R. Suzuki[1], D. Yamamoto[1], K. Takeda[1], M. Kuppan[1], G. Egawa[1] and S. Yoshimura[1] *1. Graduate School of Engineering Science, Akita University, Akita, Japan*

ROB-04. **Effect of B-site Substitution Element and Substitution Amount on Magnetic Properties in $(Bi,La)(Fe_{1-y}M_y)O_3$ (M = Co, Ni) Ferromagnetic and Ferroelectric Thin Films.** Y. Suzuki[1], T. Ozeki[1], G. Egawa[1] and *S. Yoshimura*[1] *1. Graduate School of Engineering Science, Akita University, Akita, Japan*

ROB-05. **Multiferroic skyrmions in $BiFeO_3$.** *Z. Li*[1], T. Chirac[1,2], J. Tranchida[3], V. Garcia[4], S. Fusil[4], J. Chauleau[1] and M. Viret[1] *1. SPEC, CEA Saclay, Gif-sur-Yvette, France; 2. Laboratoire Charles Coulomb, Université de Montpellier and CNRS, Montpellier, France; 3. CEA, St Paul Les Durance, France; 4. Unité Mixte de Physique CNRS, Palaiseau, France*

ROB-06. **Electron spin resonance in microwave synthesized $Bi_{0.5}Ca_{0.5}MnO_3$.** M. Marimuthu[1], Y. Lee[1] and *R. Mahendiran*[1] *1. Physics Department, National University of Singapore, Singapore*

ROB-07. **Inductance and capacitance emerged from topological electromagnetism.** *Y. Araki*[1] and J. Ieda[1] *1. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

ROB-08. **Withdrawn**

Session RPA
MAGNETOELECTRONIC MATERIALS AND PHENOMENA III (Poster Session)

Lucas Caretta, Chair
Brown University, Providence, RI, United States

RPA-01. **Enhanced tunneling electroresistance effect by interface engineering.** *L. Jiang*[1], Y. Zhu[1], B. Chi[1] and X. Han[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

RPA-02. **Nonlinear Optical and Multiferroic Properties of GFO-xAg with Magnetic Field.** T. Hsu[1], T. Han[2], *S. Huang*[1] and T. Su[1] *1. National Pingtung University, Pingtung, Taiwan; 2. National University of Kaohsiung, Kaohsiung, Taiwan*

RPA-03. **Electric field modulation of spin-flop behaviors in Co/Ru/Co/PMN-PT(011) artificial multiferroic heterostructures.** *Y. Hisada*[1], S. Komori[1], K. Imura[1] and T. Taniyama[1] *1. Department of Physics, Nagoya University, Nagoya, Japan*

RPA-04. **Tunnel-type magneto-electric effect in Co-SrF_2 nanogranular thin films influence of metal additives and theory.** *C. Wang*[1], N. Kobayashi[2], S. Ohnuma[1,2] and H. Masumoto[1] *1. Frontier Research Institute for Interdisciplinary Sciences, Sendai, Japan; 2. Research Institute for Electromagnetic Materials, Tomiya, Japan*

RPA-05. **Effect of Ar-N_2 sputtering gas on structure and TMD effect in Co–(Si–N) nanogranular films.** *T. Uchiyama*[1], Y. Cao[1], H. Kijima-Aoki[3], K. Ikeda[2], N. Kobayashi[2], S. Ohnuma[1,2] and H. Masumoto[1] *1. Frontier Research Institute for Interdisciplinary Science, Tohoku University, Sendai, Japan; 2. Research Institute for Electromagnetic Materials, Tomiya, Japan; 3. Department of Electrical Engineering, Tohoku University, Sendai, Japan*

RPA-06. **Enhanced Multiferroic and Nonlinear Optical Properties of $GaFeO_3$ Incorporated in $GaFeO_3$-$CoFe_2O_4$ Nanocomposite.** T. Han[1], T. Hsu[2], Y. Wang[1], *Y. Shih*[1] and W. Zhuang[1] *1. Department of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan; 2. Department of Applied Physics, National Pingtung University, Pingtung County, Taiwan*

RPA-07. **Switching Magnetic Strip Orientation Using Electric Fields.** *A. Chen*[1] *1. King Abdullah University of Science and Technology (KAUST), Jeddah, Saudi Arabia*

Session SOA
ALL OPTICAL SWITCHING AND ULTRAFAST MAGNETISM

Clemens von Korff Schmising, Chair
Max Born Institut, Berlin, Germany

SOA-01. **Engineering materials for single pulse all-optical switching.** ***(Invited)*** Y. Xu[1], M. Hehn[2], G. Malinowski[2], J. Hohlfeld[2], J. Gorchon[2], L.D. Buda-Prejbeanu[3], I. Prejbeanu[3], R. Sousa[1], W. Zhao[1] and *S. Mangin*[2] *1. Beihang University, Beijing, China; 2. Université de Lorraine, Nancy, France; 3. Spintec, Université Grenoble Alpes, Grenoble, France*

SOA-02. **All optical switching in transition metal synthetic ferrimagnetic multilayer systems with enhanced interlayer exchange coupling.** *C.R. Sait*[1], M. Dabrowski[1], J.N. Scott[2], W.R. Hendren[2], D.G. Newman[1], A. N/Diaye[3], C. Klewe[3], P. Shafer[3], G. van der Laan[4], P.S. Keatley[1], R.M. Bowman[2] and R. Hicken[1] *1. Physics, University of Exeter, Exeter, United Kingdom; 2. Mathematics and Physics, Queen's University Belfast, Belfast, United Kingdom; 3. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 4. Diamond Light Source Ltd, Didcot, United Kingdom*

SOA-03. **All-optical switching in a 2D van der Waals magnet CrI_3.** *M. Dabrowski*[1], S. Guo[1], M. Strungaru[2], P.S. Keatley[1], F. Withers[1], E. Santos[2] and R. Hicken[1] *1. Physics and Astronomy, University of Exeter, Exeter, United Kingdom; 2. School of Physics and Astronomy, The University of Edinburgh, Edinburgh, United Kingdom*

SOA-04. **Sub-picosecond magnetization reversal in fully ferromagnetic spin valves.** *J. Igarashi*[1], W. Zhang[1,2], Q. Remy[1,3], E. Díaz[1], J. Lin[1], J. Hohlfeld[1], M. Hehn[1], S. Mangin[1], J. Gorchon[1] and G. Malinowski[1] *1. Université de Lorraine, Nancy, France; 2. Beihang University, Hefei, China; 3. University of Cambridge, Cambridge, United Kingdom*

SOA-05. **Application of all-optical switching for a high-speed optical memory. Proposed scheme of high-speed demultiplexing.** *V. Zayets*[1], I. Serdeha[2] and V. Grygoruk[2] *1. Platform Photonics Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. Educational and Scientific Institute of High Technologies, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

SOA-06. **Femtosecond Laser Comb Driven Magnetoelastic Modes.** *A. Chaurasiya*[1], A. Awad[1], R. Khymyn[1] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden*

SOA-07. **Simulations of Magnetization Reversal in FM/AFM Bilayers With THz Frequency Pulses.** *J. Hirst*[1], S. Ruta[1], J. Jackson[3], L. Petit[3] and T. Ostler[2] *1. Materials & Engineering Research Institute, Sheffield Hallam University, Sheffield, United Kingdom; 2. University of Hull, Sheffield, United Kingdom; 3. Science and Technology Facilities Council, Daresbury, United Kingdom*

SOA-08. **Withdrawn**

SOA-09. **Ultrafast time-resolved spectroscopy of spin precession by an asynchronous optical sampling based on a dual-comb system.** *D. Nishikawa*[1], K. Maezawa[1], S. Fujii[1], M. Okano[2] and S. Watanabe[1] *1. Physics, Keio University, Yokohama, Japan; 2. Communications Engineering, National Defense Academy, Yokosuka, Japan*

ORAL SESSIONS

Session SOB
NEW APPROACHES IN COMPUTATIONAL MAGNETISM

Thomas Schrefl, Chair
University for Continuing Education Krems, Wiener Neustadt, Austria

SOB-01. **Frequency Demultiplexing of Spin Waves by Inverse-designed Magnetization Patterns, Experimentally Realized by FIB Irradiation.** *M. Kiechle*[1], A. Papp[2], L. Maucha[2], S. Mendisch[1], J. Greil[1], V. Ahrens[1], G. Csaba[2] and M. Becherer[1] *1. TUM School of Computation, Information and Technology, Technical University of Munich, Munich, Germany; 2. Faculty of Information Technology and Bionics, Pazmany Peter Catholic University, Budapest, Hungary*

SOB-02. **Multiscale simulations of soft magnetic composites.** *A. Ducevic*[1], F. Bruckner[1], C. Abert[1] and D. Suess[1] *1. Functional Materials, Universität Wien, Vienna, Austria*

SOB-03. **Convolutional neural networks to predict properties of magnetic nanostructures.** *H. Oezelt*[1], A. Kovacs[1,2], J. Fischbacher[1], L. Breth[1,2], M. Gusenbauer[1], Q. Ali[1,2], A. Kornell[1,2], S. Schaffer[3], L. Exl[3,4] and T. Schrefl[1,2] *1. Department for Integrated Sensor Systems, University of Continuing Education Krems, Wiener Neustadt, Austria; 2. Christian Doppler Laboratory for Magnet design through physics informed machine learning, Wiener Neustadt, Austria; 3. Research Platform MMM Mathematics-Magnetism-Materials Faculty of Mathematics, University of Vienna, Vienna, Austria; 4. Wolfgang Pauli Institute, Faculty of Mathematics, University of Vienna, Vienna, Austria*

SOB-04. **A path integral method for numerical simulations of spin dynamics.** *T. Nussle*[1] and J. Barker[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

SOB-05. **Longitudinal Spin Fluctuations in Atomistic Spin Models.** *D.R. Papp*[1], R.F. Evans[1] and R.W. Chantrell[1] *1. School of Physics, Engineering and Technology, University of York, York, United Kingdom*

SOB-06. **Transient retrograde motion of spin wave-driven skyrmions in magnetic nanotracks.** *L. Huang*[1], G. Burnell[1] and C. Marrows[1] *1. Physics, University of Leeds, Leeds, United Kingdom*

SOB-07. **Physics-Informed Neural Networks for Solving Two-Dimensional Magneto-Static Fields.** *Z. Gong*[3], Y. Chu[1] and S. Yang[2] *1. EEE, Imperial College London, London, United Kingdom; 2. College of Electrical Engineering, Zhejiang University, Hangzhou, China; 3. Beijing Research Institute, Zhejiang Lab, Beijing, China*

SOB-08. **Data-driven approach for accelerating the simulations of the non-linear dynamics of vortex based spin-torque nano-oscillators.** *F. Abreu Araujo*[1], S. de Wergifosse[1] and C. Chopin[1] *1. IMCN / BSMA, UCLouvain, Louvain-la-Neuve, Belgium*

SOB-09. **Zero Point Effects on the Magnetocrystalline Anisotropy of Antiferromagnets.** *R.A. Lawrence*[1] and M.I. Probert[1] *1. School of Physics, Engineering and Technology, University of York, York, United Kingdom*

Session SOC
NONLINEAR AND FUNDAMENTAL MAGNONICS PHENOMENA

Qi Wang, Co-Chair
Universitat Wien, Vienna, Austria
Santa Pile, Co-Chair
Johannes Kepler University Linz, Linz, Austria

SOC-01. **Switching Magnon Chirality in Artificial Ferrimagnet.** ***(Invited)*** *Y. Meng*[1] and H. Zhao[1] *1. Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China*

SOC-02. **Prediction and observation of virtual magnons in highly excited ferrimagnetics.** *D.A. Bozhko*[1], V.S. L'vov[2,3], A. Pomyalov[3], A.A. Serga[4] and B. Hillebrands[4] *1. Department of Physics and Energy Science, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 2. Department of Complex Systems, Weizmann Institute of Science, Rehovot, Israel; 3. Department of Chemical and Biological Physics, Weizmann Institute of Science, Rehovot, Israel; 4. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau, Kaiserslautern, Germany*

SOC-03. **Spin Wave Decoherence in the Presence of Dispersive Shock Waves.** *C.A. McEleney*[2], R.E. Camley[1] and R. Macêdo[2] *1. Center for Magnetism and Magnetic Materials, Department of Physics and Energy Science, University of Colorado at Colorado Springs, Colorado Springs, CO, United States; 2. James Watt School of Engineering, University of Glasgow, Glasgow, United Kingdom*

SOC-04. **Nonlinear excitation of short-wavelength exchange spin waves in out-of-plane magnetized YIG nanowaveguides.** Q. Wang[1,2], R.V. Verba[3], B. Heinz[4], M. Schneider[4], O. Wojewoda[5], K. Davidkova[5], K. Levchenko[1], C. Dubs[6], N.J. Mauser[2,7], M. Urbánek[5], P. Pirro[4] and *A. Chumak*[1,2] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. Research Platform Mathematics-Magnetism-Materials, University of Vienna, Vienna, Austria; 3. Institute of Magnetism, Kyiv, Ukraine; 4. TU Kaiserslautern, Kaiserslautern, Germany; 5. CEITEC BUT, Brno University of Technology, Brno, Czechia; 6. INNOVENT e.V., Jena, Germany; 7. Faculty of Mathematics, Universtity of Vienna, Vienna, Austria*

SOC-05. **Numerical and Micromagnetic Investigation of a Significant Magnon-Magnon Interaction in Magnetic Insulator Bilayers.** *J. Liu*[1] and Q. Shao[1] *1. The Hong Kong University of Science and Technology, Hong Kong, Hong Kong*

SOC-06. **Time-resolved state tomography for temporal evolution of nonlinear magnetization dynamics under parallel pumping.** *H. Shimizu*[1], T. Hioki[2,1] and E. Saitoh[1,2] *1. Applied physics, The University of Tokyo, Hongo, Bunkyo-ku, Japan; 2. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan*

SOC-07. **Non-linearities in Driven Spin-Wave Active Ring Oscillator.** *A. Mukhopadhyay*[1] and A. Prabhakar[1] *1. Department of Electrical Engineering, Indian Institute of Technology Madras, Chennai, India*

SOC-08. **Micromagnetic simulations of magnon nonlinear interactions in a YIG disk magnetic vortex.** *S. Salama*[1,2], M. Massouras[1], A. Anane[2] and J. Adam[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Palaiseau, France; 2. Unite Mixte de Physique CNRS, Thales, Universite Paris Saclay, Palaiseau, France*

SOC-09. **Goos-Hänchen effect for the inelastically scattered spin waves.** K. Sobucki[1], J. Kharlan[1,2], R.V. Verba[2], I. Lyubchanskii[3,4], M. Krawczyk[1] and *P. Gruszecki*[1] *1. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 2. Institute of Magnetism, National Academy of Sciences of Ukraine, Kyiv, Ukraine; 3. Donetsk Institute for Physics and Engineering, National Academy of Sciences of Ukraine, Kyiv, Ukraine; 4. Faculty of Physics, V. N. Karazin Kharkiv National University, Kharkiv, Ukraine*

SOC-10. **Quantified spin-wave symmetry in rectangular permalloy microstrips investigated using TR-STXM, FMR and Mumax3.** *S. Pile*[1], A. Ney[1], K. Lenz[2], R. Narkowicz[2], J. Lindner[2], S. Wintz[3], J. Förster[3], S. Mayr[4] and M. Weigand[5] *1. Johannes Kepler University, Linz, Austria; 2. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 4. Paul Scherrer Institut, Villigen PSI, Switzerland; 5. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany*

SOC-11. **Temperature Dependent Spin Gap in Multiferroic 2D-XY Antiferromagnet $Ba_2CoGe_2O_7$ Under Applied Magnetic Field.** *R. Dutta*[1,2], H. Thoma[1,2], B. Roessli[8], V. Kocsis[3,4], Y. Tokunaga[3,5], Y. Taguchi[3], Y. Tokura[3,6], I. Kézsmárki[7] and V. Hutanu[1,2] *1. RWTH Aachen University, IFK, Aachen, Germany; 2. MLZ, Forschungszentrum Julich, Garching, Germany; 3. RIKEN Center for Emergent Matter Science, Saitama, Japan; 4. Budapest University of Technology and Economics, Department of Physics, Budapest, Hungary; 5. University of Tokyo, Department of Advanced Materials Science, Kashiwa, Japan; 6. Department of Applied Physics, University of Tokyo, Quantum-Phase Electronics Center, Tokyo, Japan; 7. University of Augsburg, Department of Experimental Physics V, Augsburg, Germany; 8. Paul Scherrer Institut (PSI), Laboratory for Neutron Scattering and Imaging (LNS), Villigen, Switzerland*

SOC-12. **Distant Excitation of Spin-Waves - How Electromagnetic Cross-Talk Impacts on Hybrid Magnonic Devices.**
J. Greil[1], M. Golibrzuch[1], M. Kiechle[1], A. Papp[2], G. Csaba[2] and M. Becherer[1] *1. Technical University of Munich, Munich, Germany; 2. Pázmány Péter Catholic University, Budapest, Hungary*

SOC-13. **Ring-shaped multi-bandpass spin wave filter using YIG film.** *T. Taniguchi*[1,2], M. Lindner[1], C. Riedel[1] and C.H. Back[1] *1. Physics, Technical University of Munich, Garching, Germany; 2. Tohoku University, Sendai, Japan*

SOC-14. **Theoretical demonstration of the electron spin wave filter in semiconductor two-dimensional electron gas.**
K. Kikuchi[1], K. Nakajima[1], S. Karube[1], C. Zhang[2] and M. Kohda[1,3] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. The Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 3. Center for Strategic and International Studies, Tohoku University, Sendai, Japan*

ORAL SESSIONS

Session SOD
QUANTUM AND HYBRID MAGNONICS
Dmytro Bozhko, Chair
University of Colorado Colorado Springs, Colorado Springs, CO, United States

SOD-01. **Coupling of terahertz light with nanometer-wavelength magnons.** ***(Invited)*** *R. Salikhov*[1], I. Ilyakov[1], L. Körber[1,2], A. Kákay[1], R. Gallardo[3], A. Ponomaryov[1], J. Deinert[1], T. de Oliveira[1], K. Lenz[1], J. Fassbender[1,2], S. Bonetti[5,6], O. Hellwig[1,4], J. Lindner[1] and S. Kovalev[1] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Fakultät Physik, Technische Universität Dresden, Dresden, Germany; 3. Departamento de Física, Universidad Técnica Federico Santa María, Valparaíso, Chile; 4. Institute of Physics, Chemnitz University of Technology, Dresden, Germany; 5. Department of Physics, Stockholm University, Stockholm, Sweden; 6. Department of Molecular Sciences and Nanosystems, Ca' Foscari University of Venice, Venice, Italy*

SOD-02. **Measuring Spatially Resolved Phase of Nanoscale Spin Waves.** *O. Wojewoda*[1], F. Ligmajer[1], M. Hrton[1], J. Klima[2], M. Dhankhar[1], K. Davidkova[2], M. Stano[1], J. Holobradek[1], J. Zlamal[2], T. Sikola[2,1] and M. Urbánek[1,2] *1. CEITEC, Brno University of Technology, Brno, Czechia; 2. Institute of Physical Engineering, Brno University of Technology, Brno, Czechia*

SOD-03. **Brillouin Light Scattering Characterization of Voltage-Controlled Magnonic Waveguides via Magnetoelectric Coupling.** *P. Che*[1], J. Adam[2], S. Salama[2], A. Abdelsamie[1], V. Garcia[1], S. Fusil[1], K. Bouzehouane[1], A. Vecchiola[1], L. Iglesias[1], R. Lebrun[1], A. Barthelemy[1], M. Bibes[1], P. Bortolotti[1], A. Anane[1] and I. Boventer[1] *1. Unité Mixte de Physique, CNRS/Thales, Université Paris-Saclay, Palaiseau, France; 2. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay, Palaiseau, France*

SOD-04. **Observation of Coupled Magnon-Phonon Mode Anticrossing in a Two-Port Surface Acoustic Wave Resonator.** *Y. Hwang*[1,2], J. Puebla[2], K. Kondou[2], K. Yamamoto[3], S. Maekawa[2,3] and Y. Otani[1,2] *1. Institute for Solid State Physics, University of Tokyo, Chiba, Japan; 2. CEMS, RIKEN, Saitama, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

SOD-05. **Electric control of magnon phase and magnonic Aharonov-Casher effect.** *V.I. Vasyuchka*[1], R. Serha[2], A.A. Serga[1] and B. Hillebrands[1] *1. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau, Kaiserslautern, Germany; 2. Faculty of Physics, University of Vienna, Vienna, Austria*

SOD-06. **Strong to ultra-strong coherent coupling measurements in a YIG/cavity system at room temperature.** G. Bourcin[2,1], J. Bourhill[3], V. Vlaminck[2,1] and *V.M. Castel*[2,1] *1. Lab-STICC (UMR 6285), Brest, France; 2. IMT Atlantique, Brest, France; 3. ARC Centre of Excellence for Engineered Quantum Systems and ARC Centre of Excellence for Dark Matter Particle Physics, Perth, WA, Australia*

SOD-07. **Real-time Measurement of Coherent Energy Exchange in Remotely Coupled Hybrid Magnonic Resonators.** *M. Song*[1,2], T. Polakovic[3], T.W. Cecil[4], J.E. Pearson[1], R. Divan[5], W. Pfaff[6], W. Kwok[1], U. Welp[1], K. Kim[2], A. Hoffman[7], V. Novosad[1] and Y. Li[1] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 3. Physics Division, Argonne National Laboratory, Lemont, IL, United States; 4. High Energy Physics Division, Argonne National Laboratory, Lemont, IL, United States; 5. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 6. Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 7. Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States*

SOD-08. **Influence of paramagnetic GGG substrate on YIG films at millikelvin temperatures.** *R. Serha*[1], A. Voronov[1], D. Schmoll[1], R.V. Verba[2], S. Koraltan[1], K. Davidkova[3], B. Budinska[1], Q. Wang[1], O. Dobrovolskiy[1], M. Urbánek[3], M. Lindner[4], T. Reimann[4], C. Dubs[4], C. Abert[1], D. Suess[1], S. Knauer[1] and A. Chumak[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. Institute of Magnetism, Kyiv, Ukraine; 3. CEITEC BUT, Brno University of Technology, Brno, Czechia; 4. INNOVENT e.V. Technologieentwicklung, Jena, Germany*

SOD-09. **Universal Set of Magnon-Mediated Quantum Gates.** *C. Trevillian*[1] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States*

SOD-10. **Inverse design in nanomagnonics.** *Q. Wang*[1,2], A. Chumak[2] and P. Pirro[3] *1. School of Physics, Huazhong University of Science and Technology, Wuhan, China; 2. Faculty of Physics, University of Vienna, Vienna, Austria; 3. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany*

SOD-11. **Nano-scale physical reservoir computing based on propagating spin-wave.** *S. Iihama*[1,2], Y. Koike[3,2], S. Mizukami[2,4] and N. Yoshinaga[2,5] *1. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 2. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Department of Applied Physics, Tohoku University, Sendai, Japan; 4. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 5. MathAM-OIL, AIST, Sendai, Japan*

SOD-12. **Model of a Magnetic Waveguide for a Neural Network.** *A.A. Nikitin*[1] and E. Lähderanta[1] *1. Physics, Lappeenranta-Lahti University of Technology LUT, Lappeenranta, Finland*

SOD-13. **Spin diode effect in extended magnetic insulating films.** *R. Kohno*[1], N. Thiery[1], E. Clot[1], R. Schlitz[2], K. An[1,3], V. Naletov[1], L. Vila[1], N. Beaulieu[4], J. Ben Youssef[4], H. Merbouche[5], V. Cros[5], A. Anane[5], T. Hauet[6], V.E. Demidov[7], S. Demokritov[7], G. de Loubens[8] and O. Klein[1] *1. Université Grenoble Alpes, CEA, CNRS, Grenoble INP, Spintec, Grenoble, France; 2. Department of Materials, ETH Zürich, Zürich, Switzerland; 3. Korea Research Institute of Standards and Science, Daejeon, The Republic of Korea; 4. LabSTICC, CNRS, Université de Bretagne Occidentale, Brest, France; 5. Unité Mixte de Physique CNRS, Thales, Université Paris Saclay, Palaiseau, France; 6. Université de Lorraine, CNRS Institut Jean Lamour, Nancy, France; 7. Department of Physics, University of Muenster, Muenster, Germany; 8. SPEC, CEA-Saclay, CNRS, Université Paris Saclay, Gif-sur-Yvette, France*

Session SOE
TOPOLOGICAL AND 3D MAGNONICS

Sebastian Wintz, Chair
Max Planck Institute for Intelligent Systems, Stuttgart, Germany

SOE-01. **Spin-Wave Dynamics in Ferromagnetic Gyroid Nanostructures.** *M. Golebiewski*[1], R. Hertel[2], V.I. Vasyuchka[3], P. Pirro[3], M. Krawczyk[1] and J. Llandro[4] *1. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 2. Strasbourg Institute of Material Physics and Chemistry, University of Strasbourg, CNRS, Strasbourg, France; 3. Faculty of Physics, TU Kaiserslautern, Kaiserslautern, Germany; 4. Research Institute of Electrical Communication, Center for Science and Innovation in Spintronics, Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan*

SOE-02. **Tuning spin-wave dynamics by interlayer coupling within the nanomagnets of an artificial spin-ice.** *J. de Rojas*[1], D. Atkinson[1] and A.O. Adeyeye[1] *1. Physics, Durham University, Durham, United Kingdom*

SOE-03. **Reconfigurable spin-wave dispersion in continuous magnetic layer induced via artificial spin ice based magnonic crystal.** *T.C. Dion*[2], J. Carter-Gartside[1], K.D. Stenning[3], A. Vanstone[1], D. Arroo[3,1], H. Kurebayashi[3], W.R. Branford[1] and T. Kimura[2] *1. Blackett Laboratory, Imperial College, London, United Kingdom; 2. Solid State Physics, Kyushu University, Fukuoka, Japan; 3. London Centre for Nanotechnology, UCL, London, United Kingdom*

SOE-04. **Field Orientation dependent Spin-Wave Dynamics of Artificial Spin Ice Lattices.** *M. Kuchibhotla*[1], A. Haldar[1] and A.O. Adeyeye[2] *1. Physics, Indian Institute of Technology Hyderabad, Sangareddy, India; 2. Physics, Durham University, Durham, United Kingdom*

SOE-05. **Topological magnons and magnon-polarons in 2D magnets.** ***(Invited)*** *S. Kim*[1] *1. Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejon, The Republic of Korea*

SOE-06. **Withdrawn**

SOE-07. **Withdrawn**

SOE-08. **Topological magnons driven by the Dzyaloshinskii-Moriya interaction in the centrosymmetric ferromagnet Mn_5Ge_3.** M. dos Santos Dias[1,2], N. Biniskos[3], *F.J. dos Santos*[4,5], K. Schmalzl[6], J. Persson[7], F. Bourdarot[8], N. Marzari[4,5], S. Blügel[1], T. Brückel[7] and S. Lounis[1,2] *1. Institut and Institute for Advanced Simulation, Forschungszentrum Julich, Jülich, Germany; 2. Faculty of Physics, University of Duisburg-Essen and CENIDE, Duisburg, Germany; 3. Jülich Centre for Neutron Science at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany; 4. Theory and Simulation of Materials (THEOS), and National Centre for Computational Design and Discovery of Novel Materials (MARVEL), École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; 5. Laboratory for Materials Simulations (LMS), Paul Scherrer Institut, Villegen, Switzerland; 6. Jülich Centre for Neutron Science at ILL, Forschungszentrum Jülich GmbH, Grenoble, France; 7. Jülich Centre for Neutron Science (JCNS-2) and Peter Grünberg Institut (PGI-4), Forschungszentrum Jülich GmbH, Jülich, Germany; 8. CEA, IRIG, MEM, MDN, Université Grenoble Alpes, Grenoble, France*

SOE-09. **Low-energy magnonic edge states protected by non-equilibrium topology.** *P.M. Gunnink*[1], J.S. Harms[1], A. Mook[2] and R.A. Duine[1,3] *1. Utrecht University, Utrecht, Netherlands; 2. Johannes Gutenberg University, Mainz, Germany; 3. Eindhoven University of Technology, Eindhoven, Netherlands*

SOE-10. **Spin-Wave Frequency Comb and Penrose Superradiance.** Z. Wang[1], Z. Jin[1], H. Yuan[2], Y. Cao[1] and *P. Yan*[1] *1. University of Electronic Science and Technology of China, Chengdu, China; 2. Utrecht University, Utrecht, Netherlands*

SOE-11. **Spontaneous Emergence of Spin-Wave Frequency Combs Mediated by Vortex Gyration.** *C. Heins*[1,2], K. Schultheiss[1], L. Körber[1,2], A. Kákay[1], T. Hula[1,3], M. Bejarano[1,2], J. Lindner[1], J. Fassbender[1,2] and H. Schultheiss[1,2] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Technische Universität Dresden, Dresden, Germany; 3. Technische Universität Chemnitz, Chemnitz, Germany*

SOE-12. **Evidence of non-degenerated, non-reciprocal and ultra-fast spin-waves in the canted antiferromagnet α-Fe_2O_3.** *A. El Kanj*[1], O. Gomonay[2], I. Boventer[1], P. Bortolotti[1], V. Cros[1], A. Anane[1] and R. Lebrun[1] *1. Unité Mixte de Physique CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 2. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany*

Session SOF
ULTRAFAST MAGNETISM

Stephane Mangin, Chair
Université de Lorraine, Vandoeuvre-lès-Nancy, France

SOF-01. **Spin Dynamics at Interfaces on Femtosecond Timescales.** ***(Invited)*** *A. Eschenlohr*[1] *1. University Duisburg-Essen, Duisburg, Germany*

SOF-02. **Ultrafast electron-phonon scattering in an antiferromagnetic Dirac-semimetal.** *M. Weber*[1], K. Leckron[1] and H. Schneider[1] *1. Physics, TU Kaiserslautern, Kaiserslautern, Germany*

SOF-03. **Indirect Optical Manipulation of the Antiferromagnetic Order of Insulating NiO by Ultrafast Interfacial Energy Transfer.** *S. Wust*[1], C. Seibel[1], H. Meer[2], P. Herrgen[1], C. Schmitt[2], L. Baldrati[2], R. Ramos[3,4], T. Kikkawa[5], E. Saitoh[5,6], O. Gomonay[2], J. Sinova[2,7], Y. Mokrousov[2,8], H. Schneider[1], M. Kläui[2], B. Rethfeld[1], B. Stadtmüller[1,2] and M. Aeschlimann[1] *1. Department of Physics and Research Center OPTIMAS, RPTU Kaiserslautern-Landau, Kaiserslautern, Germany; 2. Institute of Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 3. CIQUS, Departamento de Química-Física, Universidade de Santiago de Compostela, Santiago de Compostela, Spain; 4. WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 5. Department of Applied Physics, The University of Tokyo, Tokyo, Japan; 6. Institute for AI and Beyond, The University of Tokyo, Tokyo, Japan; 7. Institute of Physics, Czech Academy of Sciences, Praha, Czechia; 8. Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Jülich and JARA, Jülich, Germany*

SOF-04. **Experimental evidence of ultrafast magnon generation in laser driven demagnetization dynamics.** ***(Invited)*** *C. von Korff Schmising*[1], S. Jana[1], K. Yao[1], M. Hennecke[1], D. Schick[1], M. Viret[2], J. Chauleau[2] and S. Eisebitt[1] *1. Max Born Institute, Berlin, Germany; 2. CEA, Paris Saclay, Paris, France*

SOF-05. **Investigating the interplay of local electron correlations and ultrafast spin dynamics in fcc nickel at the european x-ray free electron laser.** *T. Lojewski*[1], M.F. Elhanoty[2], L. Guyader[3], O. Grånäs[2], N. Agarwal[3], C. Boeglin[4], R. Carley[3], A. Castoldi[5,6], C. David[7], C. Deiter[3], F. Döring[7], R.Y. Engel[8], F. Erdinger[9], H. Fangohr[3,10], C. Fiorini[5,6], P. Fischer[9], N. Gerasimova[3], R. Gort[3], F. de Groot[11], K. Hansen[8], S. Hauf[3], D. Hickin[3], M. Izquierdo[3], B.E. Van Kuiken[3], Y. Kvashnin[2], C. Lambert[12], D. Lomidze[3], S. Maffessanti[8], L. Mercadier[3], G. Mercurio[3], P.S. Miedema[8], K. Ollefs[1], M. Pace[4], M. Porro[3,13], J. Rezvani[14], B. Rösner[7], N. Rothenbach[1], A. Samartsev[3,8], A. Scherz[3], J. Schlappa[3], C. Stamm[12,15], M. Teichmann[3], P. Thunstrom[2], M. Turcato[3], A. Yaroslavtsev[2,3], J. Zhu[3], M. Beye[8], H. Wende[1], U. Bovensiepen[1], O. Eriksson[2,16] and A. Eschenlohr[1]
1. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 2. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; 3. European XFEL, Schenefeld, Germany; 4. Institut de Physique et Chimie des Matériaux de Strasbourg, Université de Strasbourg, Strasbourg, France; 5. Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy; 6. Istituto Nazionale di Fisica Nucleare, Milano, Italy; 7. Paul Scherrer Institut, Villigen, Switzerland; 8. Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany; 9. Institute for Computer Engineering, University of Heidelberg, Heidelberg, Germany; 10. Max-Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 11. Debye Institute for Nanomaterials Science, Utrecht University, Utrecht, Netherlands; 12. Department of Materials, ETH Zurich, Zurich, Switzerland; 13. Department of Molecular Sciences and Nanosystems, Ca' Foscari University of Venice, Venezia, Italy; 14. Laboratori Nazionali di Frascati, INFN, Frascati (Roma), Italy; 15. Institute for Electric Power Systems, University of Applied Sciences and Arts Northwestern Switzerland, Windisch, Switzerland; 16. School of Science and Technology, Orebro University, Örebro, Sweden

SOF-06. **Experimental detection of magnon noise enhancement near spin reorientation in $Sm_{0.7}Er_{0.3}FeO_3$.** *M.A. Weiss*[1], A. Herbst[1], J. Schlegel[1], T. Dannegger[1], M. Evers[1], A. Donges[1], M. Nakajima[2], A. Leitenstorfer[1], S. Goennenwein[1], U. Nowak[1] and T. Kurihara[3] *1. Physics Department, University of Konstanz, Konstanz, Germany; 2. Institute of Laser Engineering, Osaka University, Osaka, Japan; 3. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan*

SOF-07. **Coherent Magnetization Dynamics in Strongly Quenched Systems.** *A. Lentfert*[1], A. De[1], L. Scheuer[1], B. Stadtmüller[1,2], B. Hillebrands[1], G. von Freymann[1,3], M. Aeschlimann[1] and P. Pirro[1] *1. University of Kaiserslautern-Landau, Kaiserslautern, Germany; 2. Johannes Gutenberg University Mainz, Mainz, Germany; 3. Fraunhofer Institute for Industrial Mathematics, Kaiserslautern, Germany*

SOF-08. **Optical Tamm states in 2D nanostructured magnetophotonic structures.** *B. Mathmann*[1], o. haidar[1,2], A. Talbi[1], N. Tiercelin[1], A. Mir[2], A. Akjouj[1] and Y. Dusch[1] *1. Univ. Lille, CNRS, Centrale Lille, Univ. Polytechnique Hauts-de-France, UMR 8520-IEMN, Lille, France; 2. Physics, Laboratory of Advanced Materials Studies and Applications (LEM2A), Moulay Ismail University, Meknes, Morocco*

SOF-09. **Optical Control of Spin Waves in Hybrid YIG/Plasmonic Structures.** *N. Kuznetsov*[1], H. Qin[2,3], L. Flajšman[1] and S. van Dijken[1] *1. Applied Physics, Aalto University, Espoo, Finland; 2. Wuhan University, Wuhan, China; 3. Wuhan Institute of Quantum Technology, Wuhan, China*

POSTER SESSION

Session SPA
MAGNETIZATION DYNAMICS AND MICROMAGNETICS (Poster Session)

Sebastian Knauer, Co-Chair
University of Vienna, Vienna, Austria
Vitaliy Vasyuchka, Co-Chair
Technische Universitaet Kaiserslautern, Kaiserslautern, Germany

SPA-01. **Design of two-dimensional magnonic crystals using a yttrium iron garnets and non-magnetic metals.** *K. Mori*[1,2], T. Koguchi[1,2], T. Watanabe[3], M. Inoue[1], K. Ishiyama[1] and T. Goto[1] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Shin-Etsu Chemical Co., Ltd, Annaka, Japan*

SPA-02. **Numerical modelling of operation of a spin-wave active-ring based physical reservoir computer.** S.I. Watt[1] and *M. Kostylev*[1] *1. Physics, University of Western Australia, Crawley, WA, Australia*

SPA-03. **Ultrafast laser induced magnetization switching in Amorphous TbCo and the Role of Element Specific Damping on HI-AOS.** *S.P. P*[1] and J.R. Mohanty[1] *1. Department of Physics, Indian Institute of Technology Hyderabad, Sangareddy, India*

SPA-04. **Micromagnetics Simulation of Highly Efficient Oscillation of Magnetization in a Ferromagnetic Local Areas via Spin Waves induced by Spin-Orbit Torque.** *T. Koda*[1], S. Muroga[2] and Y. Endo[3] *1. Electronic Mechanical Engineering, National Institute of Technology, Oshima College, SuoOshima, Japan; 2. Mathematical Science and Electrical-Electronic-Computer Engineering, Akita University, Akita, Japan; 3. Electrical Engineering, Tohoku University, Sendai, Japan*

SPA-05. **Accessing Ultrafast Demagnetization Rates of Ferrimagnetic Thin Films through THz Emission Spectroscopy.** *G. Nava Antonio*[1], Q. Remy[2], M. Hehn[3], S. Mangin[3] and C. Ciccarelli[1] *1. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 2. Department of Physics, Freie Universität Berlin, Berlin, Germany; 3. Institut Jean Lamour, Université de Lorraine, Nancy, France*

SPA-06. **Interpretation of spin-wave modes in Co/Ag nanodot arrays probed by broadband ferromagnetic resonance.** *D. Markó*[1,2], R. Cheenikundil[3], J. Bauer[3], K. Lenz[4], W. Chuang[5], K. Lin[5], J. Wu[6], M. d'Aquino[7], R. Hertel[3] and D.S. Schmool[2] *1. Magnetic Microsystem Technologies, Silicon Austria Labs GmbH, Villach, Austria; 2. Université Paris-Saclay, UVSQ, CNRS, GEMaC, Versailles, France; 3. Institut de Physique et Chimie des Matériaux de Strasbourg, Université de Strasbourg, CNRS, Strasbourg, France; 4. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 5. Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan; 6. Department of Physics, National Changhua University of Education, Changhua, Taiwan; 7. Department of Electrical Engineering and ICT, University of Naples Federico II, Naples, Italy*

SPA-07. **A Theoretical Study with Numerical Simulations of Spin-waves-induced Domain Wall Motion.** *Y. Chuang*[1] and Y. Tang[1] *1. National Central University, Taoyuan, Taiwan*

SPA-08. **Observation of mode splitting by magnon-magnon coupling in synthetic antiferromagnets.** *D. Hayashi*[1], Y. Shiota[1,2], M. Ishibashi[1], R. Hisatomi[1,2], T. Moriyama[1,2] and T. Ono[1,2] *1. Institute for Chemical Research, Kyoto University, Uji, Japan; 2. Center for Spintronics Research Network, Kyoto University, Uji, Japan*

SPA-09. **Direct observation of propagating magnons with large non-reciprocity.** R. Gallardo[1], M. Weigand[2], K. Schultheiss[6], A. Kákay[6], R. Mattheis[3], J. Raabe[4], G. Schütz[5], A. Deac[7], J. Lindner[6] and *S. Wintz*[5,2] *1. Universidad Técnica Federico Santa María, Valparaíso, Chile; 2. Helmholtz-Zentrum Berlin, Berlin, Germany; 3. Leibniz Institut für Photonische Technologien, Jena, Germany; 4. Paul Scherrer Institut, Villigen PSI, Switzerland; 5. Max Planck Institut für Intelligente Systeme, Stuttgart, Germany; 6. Institute of ion beam physics and materials research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 7. Dresden high magnetic field laboratory, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

SPA-10. **Signal equalization of nonreciprocal SWs by using an air gap in nm-thick YIG microstructure.** *M. Sarker*[1], K. Terao[1], H. Yamahara[1], M. Seki[1] and H. Tabata[1] *1. Department of Electrical Engineering and Information Systems, The University of Tokyo, Tokyo, Japan*

SPA-11. **Propagating Spin-Wave Spectroscopy At Millikelvin Temperatures Using Arbitrary Magnetisation Orientations.** *S. Knauer*[1], S. Peinhaupt[1], K. Davidkova[2], D. Schmoll[1,3], R. Serha[1,3], A. Voronov[1,3], Q. Wang[1], M. Lindner[4], T. Reimann[4], C. Dubs[4], M. Urbánek[2] and A. Chumak[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria; 2. Brno University of Technology, CEITEC BUT, Brno, Czechia; 3. Vienna Doctoral School in Physics, University of Vienna, Vienna, Austria; 4. INNOVENT e.V. Technologieentwicklung, Jena, Germany*

SPA-12. **Spin-wave dynamics in the multi-layered ferromagnetic nanorod.** *H. Reshetniak*[1], N. Lesniewski[1], U. Makartsou[1], M. Golebiewski[1], P. Gruszecki[1] and M. Krawczyk[1] *1. Institute of Spintronics and Quantum Information, Adam Mickiewicz University, Poznan, Poland*

SPA-13. **Spin motive force generated by non-linear spin waves.** *K. Hoshi*[1,2], T. Hioki[3,1] and E. Saitoh[1,2] *1. The University of Tokyo, Tokyo, Japan; 2. institute for AI and Beyond, Tokyo, Japan; 3. Tohoku University, Sendai, Japan*

SPA-14. **Global Biasing Using a Hardware-Based Artificial Zeeman Term in Spinwave Ising Machines.** *V. Gonzalez*[1], A. Litvinenko[1], R. Khymyn[1] and J. Åkerman[1] *1. University of Gothenburg, Gothenburg, Sweden*

SPA-15. **Magnetic Structures and Spinwave Excitations in Rare-earth Iron Garnet near Compensation Temperature.** *M. Mori*[1] *1. Japan Atomic Energy Agency, Ibaraki, Tokai, Japan*

SPA-16. **Three Dimensional Spatial Distributions of Demagnetization Factors in Assemblies of Discrete Magnetic Elements: A Multi-scalar Approach and Solution.** S. McCann[1] and *T. Mercer*[1] *1. University of Central Lancashire, Preston, United Kingdom*

SPA-17. **Nonlinear spin-wave transport in the YIG nano-waveguides.** *K. Davídková*[1], Q. Wang[3], A. Voronov[3], O. Wojewoda[5], S. Knauer[3], M. Lindner[4], T. Reimann[4], C. Dubs[4], A. Chumak[3] and M. Urbánek[1,2] *1. Physical engeneering, Brno University of Technology, Brno, Czechia; 2. CEITEC BUT, Brno, Czechia; 3. Faculty of Physics, Vienna University of Technology, Vienna, Austria; 4. INNOVENT e. V. Technologieentwicklung, Jena, Germany; 5. CEITEC, Brno University of Technology, Brno, Czechia*

SPA-18. **Timescales and contribution of heating and helicity effect in helicity-dependent all-optical switching.** G. Li[2], *X. Zheng*[1], J. Wang[2], X. Lu[3], J. Wu[4], T. Ostler[5] and Y. Xu[4] *1. Beihang University, Beijing, China; 2. Guangdong University of Technology, Guangdong, China; 3. Nanjing Unversity, Nanjing, China; 4. University of York, York, United Kingdom; 5. Sheffield Hallam University, Sheffield, United Kingdom*

SPA-19. **Influence of non-local damping on magnon properties of ferromagnets.** *Z. Lu*[1] *1. Applied physics, KTH Royal Institute of Technology, Stockholm, Sweden*

ORAL SESSIONS

Session TOA
MAGNETIC TEXTURES I

Sachin Krishnia, Chair
Unite Mixte de Physique CNRS/Thales, Palaiseau, France

TOA-01. **Room temperature skyrmions in synthetic antiferromagnets and their fast current induced dynamics without skyrmion Hall effect.** ***(Invited)*** *O. Boulle*[1] *1. SPINTEC, GRENOBLE, France*

TOA-02. **External bias field control of skyrmion dynamics in a magnetic nanotrack.** *H. Perumal*[1], S. Syamlal[1], B. Priyanka[1] and J. Sinha[1] *1. Physics and Nanotechnology, SRM Institute of Science and Technology, Chennai, India*

TOA-03. **Constriction effect on skyrmions properties.** *Y. Urbina-Elgueta*[1,3], J. C. Denardin[1,3] and J. Palma[2,3] *1. Physics, Universidad de Santiago, Santiago, Chile; 2. Ingenieria, Universidad Central, Santiago, Chile; 3. Centro para el Desarrollo de la Nanociencia y la Nanotecnología, Santiago, Chile*

TOA-04. **Withdrawn**

TOA-05. **Spin torque driven Skyrmion resonance technique in frustrated Fe_3Sn_2 crystal.** *N. Bernstein*[1], B.J. Assouline[1], H. Li[2], I. Rozhansky[1], W. Wang[2] and A. Capua[1] *1. Applied Physics, The Hebrew University of Jerusalem, Jerusalem, Israel; 2. Beijing National Laboratory for Condensed Matter Physics, Chinese Academy of Sciences, Beijing, China*

TOA-06. **Interaction of propagating spin waves with extended skyrmions.** *R. Mansell*[1], T. Schaffers[1], R.B. Holländer[1], H. Qin[1,2] and S. van Dijken[1] *1. Department of Applied Physics, Aalto University, Espoo, Finland; 2. School of Physics and Technology, Wuhan University, Wuhan, China*

TOA-07. **Effect of DMI tensor components on antiskyrmion properties.** *A. Di Pietro*[3,1], P. Ansalone[3], F. García Sánchez[2], V. Basso[3], A. Magni[3] and G. Durin[3] *1. Solid state physics, Politecnico di Torino, Turin, Italy; 2. Applied Physics, Universidad de Salamanca, Salamanca, Spain; 3. Istituto Nazionale di Ricerca Metrologica, Turin, Italy*

TOA-08. **Impact of the Ampère-Oersted field on the dynamics of spin-torque vortex oscillators.** *S. de Wergifosse*[1], C. Chopin[1] and F. Abreu Araujo[1] *1. UCLouvain, Louvain-la-Neuve, Belgium*

TOA-09. **Dynamic properties of magnetic hopfions.** ***(Invited)*** *O. Tartakivska*[1,2], M. Krawczyk[1], K. Sobucki[1] and P. Graczyk[3] *1. Adam Mickiewicz University Poznan Poland, Poznan, Poland; 2. Institute of Magnetism, National Academy of Sciences of Ukraine, Kyiv, Ukraine; 3. Institute of Molecular Physics PAS, Poznan, Poland*

TOA-10. **Current-induced nonreciprocal dynamics and nonlinear Hall effect of a magnetic hopfion.** *Y. Liu*[1], H. Watanabe[1] and N. Nagaosa[1,2] *1. Center for Emergent Matter Science, RIKEN, Wako, Japan; 2. Department of Applied Physics, The University of Tokyo, Tokyo, Japan*

TOA-11. **Dynamics of an Antiferromagnetic Bloch Line Driven by Spin Current.** *R. Ovcharov*[1], B. Ivanov[2,3], J. Åkerman[1] and R. Khymyn[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden; 2. Institute of Magnetism of NASU and MESU, Kyiv, Ukraine; 3. Institute for Molecules and Materials, Radboud University, Nijmegen, Netherlands*

TOA-12. **Resonant Magnetoelastic Coupling Between Magnetic Vortex and Lattice Breathing Modes.** *A. Bondarenko*[1,2], M. Kounalakis[1,3], S. Viola Kusminskiy[3,4], G. Bauer[5,6] and Y. Blanter[1] *1. Kavli Institute of Nanoscience, Delft University of Technology, Delft, Netherlands; 2. Institute of Magnetism of NAS and MOS of Ukraine, Kyiv, Ukraine; 3. Institute for Theoretical Solid State Physics, RWTH Aachen University, Aachen, Germany; 4. Max Planck Institute for the Science of Light, Erlangen, Germany; 5. WPI-AIMR, Tohoku University, Sendai, Japan; 6. Kavli Institute for Theoretical Sciences, University of the Chinese Academy of Sciences, Beijing, China*

Session TOB
MAGNETIZATION DYNAMICS AND DAMPING I

Paul Keatley, Chair
University of Exeter, Exeter, United Kingdom

TOB-01. **Nonlinear Multi-Magnon Scattering in Ensembles of Nanomagnets.** ***(Invited)*** S. Lendinez[1], M.T. Kaffash[1], O.G. Heinonen[2], S. Gliga[4], E. Iacocca[3] and *B. Jungfleisch*[1] *1. University of Delaware, Newark, DE, United States; 2. Argonne National Laboratory, Lemont, IL, United States; 3. University of Colorado Colorado Springs, Colorado Springs, CO, United States; 4. Paul Scherrer Institute, Villigen, Switzerland*

TOB-02. **Magnon Cherenkov effect in ferromagnet/superconductor heterostructures.** ***(Invited)*** *O. Dobrovolskiy*[1] *1. Faculty of Physics, University of Vienna, Vienna, Austria*

TOB-03. **Compensation of anisotropy in spin-Hall devices for neuromorphic applications.** P. Sethi[1], D. Sanz Hernandez[1], F. Godel[1], S. Krishnia[1], F. Ajejas[1], A. Mizrahi[1], V. Cros[1], D. Markovic[1] and *J. Grollier*[1] *1. Unite Mixte de Physique CNRS/Thales, Palaiseau, France*

TOB-04. **Impact of Pulse Amplitude on Voltage-Driven Precessional Switching Dynamics Using Macrospin Modeling.** *D. Favaro*[1,2], W. Kim[1], M. Gama Monteiro[1], S. Rao[1], R. Carpenter[1], J. Van Houdt[1,3], K. Temst[2,1] and S. Couet[1] *1. Imec, Leuven, Belgium; 2. Quantum Solid State Physics (QSP), Department of Physics and Astronomy, KU Leuven, Leuven, Belgium; 3. Semiconductor Physics, Department of Physics and Astronomy, KU Leuven, Leuven, Belgium*

TOB-05. **Effect of thermal annealing on the magnetization reversal and spin dynamics in ferrimagnetic CoTb thin films.** J. Pradhan[1], M. Devapriya[1], R. Mondal[2], M. Talluri[2], A. Haldar[1] and *C. Murapaka*[2] *1. Physics, Indian Institute of Technology Hyderabad, Sangareddy, India; 2. Materials Science and Metallurgical Engineering, Indian Institute of Technology Hyderabad, Sangareddy, India*

TOB-06. **Spin Dynamics with Inertia in Ferromagnetic Thin Films.** *A. De*[1], A. Lentfert[1], L. Scheuer[1], B. Stadtmüller[1,2], P. Pirro[1], G. von Freymann[1,3] and M. Aeschlimann[1] *1. TU Kaiserslautern, Kaiserslautern, Germany; 2. Johannes Gutenberg University, Mainz, Germany; 3. Fraunhofer Institute for Industrial Mathematics, Kaiserslautern, Germany*

TOB-07. **Study on magnetization dynamics induced by the spin-orbit torque in devices consisting of hematite.** *A. Yamaguchi*[1], N. Matsumoto[2], W. Yoshikawa[2] and Y. Fujii[2] *1. Laboratry of Advanced Science and Technology for Industry, University of Hyogo, Ako-gun, Japan; 2. KRI Inc., Kyoto, Japan*

TOB-08. **Investigating coupling mechanisms in vortex-based Magnetic Tunnel Junctions.** *A. Jenkins*[1], L. Martins[1], L. Benetti[1], A. Schulman[1], P. Anacleto[1] and R. Ferreira[1] *1. International Iberian Nanotechnology Laboratory, Braga, Portugal*

TOB-09. **Binding Events Leveraging the Mutual Synchronization of Spintronic Nano-oscillators.** *M. Romera*[1,2], P. Talatchian[1], S. Tsunegi[3], K. Yakushiji[3], A. Fukushima[3], H. Kubota[3], S. Yuasa[3], V. Cros[1], P. Bortolotti[1], M. Ernoult[1,4], D. Querlioz[4] and J. Grollier[1] *1. Unité Mixte de Physique, CNRS, Thales, Univ. Paris-Sud, Université Paris-Saclay, Palaiseau, France; 2. GFMC, Dpto. Física de Materiales, Universidad Complutense de Madrid, Madrid, Spain; 3. National Institute of Advanced Industrial Science and Technology (AIST), Spintronics Research Center, Tsukuba, Japan; 4. Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Orsay, France*

TOB-10. **Dynamic magnetization behavior of magnetostatically coupled linear chains of thick Permalloy nanomagnets.** *J.R. Scott*[1], D. Atkinson[1] and A.O. Adeyeye[1] *1. Physics, Durham University, Durham, United Kingdom*

TOB-11. **Permeability Control of Ferromagnetic Wires for Time-varying Spintronic Metamaterials.** *T. Kodama*[1], N. Kikuchi[2], S. Okamoto[2,3], S. Ohno[4] and S. Tomita[1,4] *1. Institute for Excellence in Higher Education, Tohoku University, Sendai, Japan; 2. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 3. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 4. Department of Physics, Graduate School of Science, Tohoku University, Sendai, Japan*

TOB-12. **Investigations of ferromagnetic resonance and inverse spin Hall effect in NiFe/FeMn/NiFe multilayers with varying antiferromagnetic layer thickness.** *B. Panigrahi*[1], M. Manivel Raja[3], C. Murapaka[2] and A. Haldar[1] *1. Department of Physics, Indian Institute of Technology, Hyderabad, Sangareddy, India; 2. Department of Materials Science and Metallurgical Engineering, Indian Institute of Technology, Hyderabad, Sangareddy, India; 3. Advanced Magnetic Group, Defence Metallurgical Research Laboratory, Kanchanbagh, India*

TOB-13. **Ferromagnetic resonance hysteresis in hybrid magnetic trilayers with combined in-plane and perpendicular magnetic anisotropies.** *D. Markó*[1,2], D.S. Schmool[2], K. Lenz[3], J. Díaz[4,5], C. Quirós[4,5], A. Hierro-Rodriguez[4,5], M. Velez[4,5] and L.M. Álvarez-Prado[4,5] *1. Magnetic Microsystem Technologies, Silicon Austria Labs GmbH, Villach, Austria; 2. Université Paris-Saclay, UVSQ, CNRS, GEMaC, Versailles, France; 3. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 4. Departamento de Física, Facultad de Ciencias, Universidad de Oviedo, Oviedo, Spain; 5. Centro de Investigación en Nanomateriales y Nanotecnología (CINN), CSIC-Universidad de Oviedo, El Entrego, Spain*

TOB-14. **Thickness dependence of creep-scaling behavior in Pt/Co single interface films.** *J. Yu*[1], S. Lee[1], M. Kim[1], J. Shin[1], W. Shim[1] and S. Choe[1] *1. Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea*

TOB-15. **Epitaxial $Co_2FeSi/LiNbO_3$ multiferroic heterostructures with a low damping constant.** *S. Yamada*[1,2], T. Usami[1], S. Komori[3], S. Nagata[4], Y. Nozaki[5,6], T. Taniyama[3] and K. Hamaya[1,2] *1. Center for Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Spintronics Research Network Division, Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan; 3. Department of Physics, Nagoya University, Nagoya, Japan; 4. Department of Systems Innovation, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 5. Department of Physics, Keio University, Yokohama, Japan; 6. Center for Spintronics Research Network, Keio University, Yokohama, Japan*

TOB-16. **Magnetization dynamics of $[Co_{60}Fe_{40}/Pt]_5$ multilayers synthesized over varying Pt buffer structures.**
F.M. Matinaga[1], M. Tavares[1], A. Krohling[1], G. Gomes[3,4], L. Fernandez[3], M. Martins[1], L.H. Andrade[1], P. Nakarmi[2] and T. Mewes[2] *1. Centro de Desenvolvimento de Tecnologia Nuclear, Belo Horizonte, Brazil; 2. Department of Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States; 3. Depto de Física, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil; 4. Universidade de Montes Claros, Montes Claros, Brazil*

TOB-17. **Observation of Coherence Anomaly in $Y_3Fe_5O_{12}$.**
T. Makiuchi[1], T. Hioki[1,2], H. Shimizu[1], K. Hoshi[1,4], M. Elyasi[2], K. Yamamoto[3], N. Yokoi[1,4], G. Bauer[2] and E. Saitoh[1,4] *1. Department of Applied Physics, The University of Tokyo, Bunkyo, Japan; 2. Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 4. Institute for AI and Beyond, The University of Tokyo, Bunkyo, Japan*

Session TOC
MICROMAGNETICS AND HYSTERESIS MODELING I

Arabinda Haldar, Chair
Indian Institute of Technology Hyderabad, Hyderabad, India

TOC-01. **Finite Difference Micromagnetic Simulations using True 3D Periodic Boundary Conditions.**
F. Bruckner[1], A. Ducevic[1], C. Abert[1] and D. Suess[1] *1. Functional Materials, University of Vienna, Vienna, Austria*

TOC-02. **Hybrid precorrected FFT - Poisson solver method for the magnetostatic field in finite element micromagnetic modeling.**
J. Duan[1] and V. Lomakin[1] *1. University of California, San Diego, San Diego, CA, United States*

TOC-03. **Introducing the step Monte Carlo method for simulating dynamic properties.**
D. Sztenkiel[1] *1. Institute of Physics, Polish Academy of Sciences, Warszawa, Poland*

TOC-04. **Modeling of Multi-Level Spin-Orbit Torque-MRAM: Scalability, Stochasticity, and Variations.**
Z. Tong[1], S. Cheung[1], Z. Ren[1], P. Yang[2] and Q. Shao[1] *1. Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong; 2. Center for Statistical Science, Tsinghua University, Beijing, China*

TOC-05. **Advanced Micromagnetic HAMR Model: Investigation of Damping Dependence and Parametric Optimization for High Performance.** *W. Pantasri*[1], A. Meo[3], R.W. Chantrell[2], P. Chureemart[1] and J. Chureemart[1] *1. Physics, Mahasarakham University, Kantarawichai, Thailand; 2. Physics, University of York, York, United Kingdom; 3. electrical and Information Engineering, Politecnico of Bari, Bari, Italy*

TOC-06. **Rigorous single-period micromagnetic model of stripe domains: Comparison with analytics and experiment.** S. Deussner[1], *D. Suess*[1], C. Abert[1], F. Bruckner[1], S. Faehler[2], P.T. Heistracher[1], L. Reichel[3] and V. Neu[3] *1. University of Vienna, Vienna; 2. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 3. Leibniz IFW, Dresden, Germany*

TOC-07. **A micromagnetic study on the domain-wall coupling in double-helix shaped magnetic nano structures.** *C. Abert*[1], C. Donnelly[2], S. Koraltan[1], F. Bruckner[1], S. Ruiz-Gomez[2], A. Hierro-Rodriguez[3], S. Finizio[4], J. Raabe[4], A. Pacheco[5] and D. Suess[1] *1. University of Vienna, Vienna, Austria; 2. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 3. University of Oviedo, Oviedo, Spain; 4. Paul Scherrer Institut, Villigen, Switzerland; 5. University of Zaragoza, Zaragoza, Spain*

TOC-08. **Control of magnetization chirality in a ferromagnetic ring using a single nanoelement.** *U. Makartsou*[1], M. Moalic[1], M.K. Zelent[1] and M. Krawczyk[1] *1. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland*

TOC-09. **Micromagnetic Simulations of CoFeB/MgO Perpendicular Stacks for Sensor Applications.** *P.M. Santos*[1,2], P. Araujo[1,2], D. Sorensen[1,2], F. Matos[1,2] and S. Cardoso[1,2] *1. Instituto de Engenharia de Sistemas E Computadores – Microsistemas e Nanotecnologias (INESC MN) Lisbon, Lisbon, Portugal; 2. Instituto Superior Tecnico, Universidade de Lisboa, Lisboa, Portugal*

TOC-10. **Electronic Structure and Exchange Bias of a Compensated Ferrimagnet Mn_2PtAl.** *A. Lukoyanov*[1], S. Samatham[2], A. Patel[3], P. Babu[4] and K. G. Suresh[5] *1. M. N. Mikheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russian Federation; 2. Department of Physics, Chaitanya Bharathi Institute of Technology, Hyderabad, India; 3. Research Centre for Magnetic and Spintronic Materials, National Institute for Materials Science, Tsukuba, Japan; 4. UGC-DAE Consortium for Scientific Research, Mumbai Center, BARC Campus, Mumbai, India; 5. Magnetic Materials Laboratory, Department of Physics, ndian Institute of Technology Bombay, Mumbai, India*

TOC-11. **Structural and micromagnetic modeling of the magnetic binder phase in WC-Co cemented carbides.** *L. Breth*[1,2], J. Fischbacher[1,2], A. Kovacs[1,2], H. Oezelt[1,2], T. Schrefl[1,2], C. Czettl[3], S. Kuehrer[3], J. Pachlhofer[3], M. Schwarz[3], T. Weirather[3] and H. Brueckl[1] *1. Department for Integrated Sensor Systems, University of Continuing Education Krems, Wiener Neustadt, Austria; 2. Christian Doppler Laboratory for magnet design through physics informed machine learning, University for Continuing Eduaction, Wiener Neustadt, Austria; 3. R&D Cutting Tools, Ceratizit Austria GmbH, Reutte, Austria*

TOC-12. **Tuning the coercivity of permanent magnets by the combined effect of field angle and defect thickness.** *Q. Ali*[2,1], J. Fischbacher[2,1], A. Kovacs[2,1], H. Oezelt[2,1], M. Gusenbauer[2,1] and T. Schrefl[2,1] *1. Department for Integrated Sensor Systems, University for Continuing Education Krems, Wiener Neustadt, Austria, Wiener Neustadt, Austria; 2. Christian Doppler Laboratory for magnet design through physics informed machine learning, University for Continuing Education Krems, Wiener Neustadt, Austria, Wiener Neustadt, Austria*

Session TPA
MAGNETIC TEXTURES II (Poster Session)

Keisuke Yamada, Chair
Gifu University, Gifu, Japan

TPA-01. **Demonstration of the Current-Driven Bloch Line Motion for Novel Magnetic Memory Operation.** *J. Yang*[1], T. Lee[1], K. Moon[2], A.M. Park[1], S. Lee[1], M. Shin[3], S. Kim[4] and K. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Quantum Spin Team, Korea Reserach Institute of Standards and Science, Daejeon, The Republic of Korea; 3. School of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 4. Physics, University of Ulsan, Daejeon, The Republic of Korea*

TPA-02. **Dynamics of magnetic domain-walls in spintronic device observed by Kerr microscopy.** *X. Zhang*[1,2], Y. Pan[1,2], Z. Cao[2], H. Yang[1] and W. Zhao[1] *1. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China; 2. Beihang Hangzhou Innovation Institute (Yuhang), Beihang University, Hangzhou, China*

TPA-03. **Universal Relation bewteen Energy Barrier and Properties of Ferromagnet.** *M. Kim*[1], D. Kim[2] and S. Choe[1] *1. Department of Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea; 2. Center for Spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea*

TPA-04. **Tunable Creation of Bimerons in Confined Circular Nanodots.** *B. Priyanka*[1], S. Syamlal[1], H. Perumal[1] and J. Sinha[1] *1. Physics and Nanotechnology, SRM University, Chennai, India*

TPA-05. **Skyrmion vs. antiskyrmion Hall angles.** *B. Kim*[1] *1. Mathematics and Physics, University of Wisconsin-Parkside, Kenosha, WI, United States*

TPA-06. **Magnon dynamics in a Skyrmion-textured domain wall of antiferromagnets.** *S. Lee*[1], K. Nakata[2], O. Tchernyshyov[3] and S. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology (KAIST), Deajeon, The Republic of Korea; 2. Japan Atomic Energy Agency, Tokai, Japan; 3. Physics and Astronomy, Johns Hopkins University, Baltimore, MD, United States*

TPA-07. **Depinning Field of Vortex wall at Triangular Notch with Various incoming Angles in Permalloy Wires.** *D. Shiu*[1], K. Lai[1], P. Wang[1], R. Cao[2] and L. Horng[1] *1. Physics, National Changhua, Changhua, Taiwan; 2. Electrical Engineering, Feng Chia University, Taichung, Taiwan*

TPA-08. **Influence of pinning on the dynamics of vortex-based magnetic tunnel junctions.** *A. Jenkins*[1], L. Martins[1], L. Benetti[1], A. Schulman[1], P. Anacleto[1], M. Claro[1], T. Boehnert[1] and R. Ferreira[1] *1. International Iberian Nanotechnology Laboratory, Braga, Portugal*

TPA-09. **Frequency Sensing and Detection using Granular Vortex MTJ Nano Oscillator.** S. Shreya[1], A. Jenkins[2], *T. Böhnert*[2], R. Ferreira[2], F. Moradi[1] and H. Farkhani[1] *1. Electrical and Computer Engineering Department, Aarhus University, Aarhus, Denmark; 2. International Iberian Nanotechnology Laboratory (INL), Braga, Portugal*

TPA-10. **Chiral coupling of two orthogonal magnetizations in GdCo ferrimagnet.** *S. Ko*[1], J. Park[2], J. Park[1], J. Yuk[2] and K. Kim[1] *1. Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea; 2. Material Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, The Republic of Korea*

Session TPB
MAGNETIZATION DYNAMICS AND DAMPING II (Poster Session)

Dieter Suess, Chair
University of Vienna, Vienna, Austria

TPB-01. **Magnetization dynamics in FePt nano-granular with thermal heating observed by all-optical pump-probe method.** *Y. Sasaki*[1], I. Suzuki[2], R. Mandal[3], S. Kasai[2] and Y. Takahashi[2] *1. International Center for Young Scientists, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan*

TPB-02. **Effect of rapid thermal annealing on magnetic properties and FMR damping of CoFeB multilayer structure.** *Y. Karampuri*[1], Y. Wang[2], J. Kim[2], H. Divi[1] and T. Wu[2] *1. Physics, National Institute of Technology, Warangal, India; 2. School of Information science and Technology, Shanghai Tech University, Shanghai, China*

TPB-03. **Temperature-dependent spin dynamics in WSe2/Pt/CoFe trilayers.** *Z. Li*[1], Y. Zhang[1], J. Zhang[1], Y. Song[1], S. Zhang[1], Q. Jin[1] and Z. Zhang[1] *1. Department of Optical Science and Engineering, Fudan University, Shanghai, China*

TPB-04. **Effect of Si Composition on Static and Dynamic Magnetic Properties of Fe-Si Films.** *Y. Jiang*[1], T. Miyazaki[2] and Y. Endo[1,3] *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Faculty of Engineering, Tohoku University, Sendai, Japan; 3. Center for Science and Innovation in Spintronics (CSIS), Tohoku University, Sendai, Japan*

TPB-05. **Spin waves softening in thin films with perpendicular anisotropy.** *N. Lesniewski*[1] and P. Gruszecki[1] *1. Physics, Adam Mickiewicz University, Poznan, Poland*

TPB-06. **Fitting of X-Band CW FMR in Exchange-Biased [Co/Pt] Multilayers.** *B. Shortall*[1] and P.S. Stamenov[1] *1. School of Physics and CRANN, Trinity College Dublin, Dublin, Ireland*

TPB-07. **Binary Terahertz Frequency Shift Keying Modulation in Spin Torque Oscillators with Synthetic Antiferromagnetic Layer.** *Y. Wang*[1], C. Zheng[1], D. Zhang[1] and Y. Liu[1] *1. Tongji University, Shanghai, China*

TPB-08. **Magnetization Process of Stadium-Shaped Magnetic Tunnel Junction Cells for Artificial Spin Ice.** *H. Kubota*[1], S. Tsunegi[1], K. Yakushiji[1], T. Taniguchi[1], S. Tamaru[1], T. Yamamoto[1], A. Sugihara[1], H. Nomura[2,3] and Y. Suzuki[2,4] *1. National Institute of Industrial Science and Technology (AIST), Tsukuba, Japan; 2. Osaka University, Toyonaka, Japan; 3. SRIS, Tohoku University, Sendai, Japan; 4. CSRN, Osaka University, Toyonaka, Japan*

TPB-09. **Anomalous Charge-to-Spin Conversion in Paramagnetic Metal $CaRuO_3$.** *J. Zhang*[1], F. Han[2], H. Wu[1] and J. Sun[3] *1. Songshan Lake Materials Laboratory, Dongguan, China; 2. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China; 3. Beijing National Laboratory for Condensed Matter Physics & Institute of Physics, Beijing, China*

TPB-10. **Spin reorientation transitions, field induced spin switching and exchange bias behaviour in $Sm_{1-x}Y_xFeO_3$ Single crystals.** *S. Das*[1], B. Mali[1], R. Ganesan[1] and S. Elizabeth[1] *1. Physics, Indian Institute of Science, Bangalore, India*

TPB-11. **Magnetization reversal and Gilbert damping in $Co_2FeAl_{0.5}Si_{0.5}$ (CFAS) quaternary Heusler alloy.** *L.A. Longchar*[1], M. Rahaman[1], M.M. Raja[2], V.R. Reddy[3], S.N. Kaul[1] and S. Srinath[1] *1. School of Physics, University of Hyderabad, Hyderabad, India; 2. Defence Metallurgical research Laboratory, Telangana, India; 3. UGC-DAE CSR, Indore, India*

TPB-12. **Perpendicular magnetic anisotropy in bismuth-doped yttrium iron garnet thin films.** *S. Mozhikunnath Das*[1], L. Flajšman[1], R. Mansell[1] and S. van Dijken[1] *1. Department of applied physics, Aalto University, Espoo, Finland*

POSTER SESSION

Session TPC
MICROMAGNETICS AND HYSTERESIS MODELING II (Poster Session)

Satoshi Iihama, Chair
Tohoku University, Sendai, Japan

TPC-01. **FEA Verification and Analyses for the Attraction Cases between Magnetic Like Poles.** *S. Ran*[1], M. Zou[2], G. Mizzell[3] and C. Chen[1,4] *1. Quadrant Solutions, San Jose, CA, United States; 2. Lab Magnetics, A Quadrant Company, San Jose, CA, United States; 3. SuperMagnetMan, Pelham, AL, United States; 4. Magnet Energy, LLC, San Jose, CA, United States*

TPC-02. **Is there theoretical upper limit of coercivity?** *C. Mitsumata*[1], M. Mizuguchi[2] and M. Kotsugi[1] *1. Materials Science, Tokyo University of Science, Tokyo, Japan; 2. Materials Science and Technology, Nagoya University, Nagoya, Japan*

TPC-03. **Analytical Inverse Preisach Model and Its Comparison With Inverse J-A Model in terms of Accuracy and Computational Efficiency.** *R. Liu*[1], C. Gu[1], J. Sun[2] and B. Tang[1] *1. China Three Gorges University, Yichang, China; 2. Testing Center of Yichang Three Gorges Power Transmission and Transformation Engineering Co. Ltd., Yichang, China*

TPC-04. **An Experimental-Numerical Approach for Energy Loss Separation of Grain-Oriented Electrical Steels.** *H. Hamzehbahmani*[4], T. Shibauchi[1], Y. Gao[1], W. Guan[2] and K. Muramatsu[3] *1. Oita University, Oita, Japan; 2. Wuhan University, School of Electrical Engineering and Automation, Wuhan, China; 3. Saga University, Saga, Japan; 4. Durham University, Durham, United Kingdom*

TPC-05. **Enhancement of HAMR performances by FePt based exchange coupled composite media.** W. Pantasri[1], A. Meo[2,1], R.W. Chantrell[3], P. Chureemart[1] and *J. Chureemart*[1] *1. Physics, Mahasarakham University, Kantarawichai, Thailand; 2. Electrical and Information Engineering, Politecnico of Bari, Bari, Italy; 3. Physics, University of York, York, United Kingdom*

TPC-06. **Predictions of Optimal Heating by Magnetic Reversal Behavior of Magnetic Nanowires with Different Materials.** *Y. Chen*[1] and B. Stadler[2,1] *1. CEMS, University of Minnesota, Minneapolis, MN, United States; 2. ECE, University of Minnesota, Minneapolis, MN, United States*

TPC-07. **Temperature influences on the vortex chirality probability in permalloy asymmetric disk array.** *K. Lai*[1], D. Shiu[1], C. Chen[1], V. Arockia Doss[1] and L. Horng[1] *1. National Changhua University of Education Department of Physics, Changhua, Taiwan*

TPC-08. **Control of Magnetization Precession Frequency using Current Density of Spin-Orbit Torque Applied to Local Area.** *T. Koda*[1], A. Nakagawa[1], S. Muroga[3] and Y. Endo[2] *1. Electronic Mechanical Engineering, National Institute of Technology, Oshima College, SuoOshima, Japan; 2. Electrical Engineering, Tohoku University, Sendai, Japan; 3. Mathematical Science and Electrical-Electronic-Computer Engineering, Akita University, Akita, Japan*

TPC-09. **Simulation of spin-orbit-torque switching of a perpendicular nanomagnet assisted by DMI.** J. Watanabe[1], *K. Yamada*[2] and Y. Nakatani[1] *1. Graduate School of Informatics and Engineering, University of Electro-Communications, Chofu, Japan; 2. Faculty of Engineering, Gifu University, Gifu City, Japan*

ORAL SESSIONS

Session UOA
COMPLEX MAGNETIC OXIDES/INSULATORS

Sandra Ruiz Gómez, Chair
Max Planck Institute for Chemical Physics of Solids, Cerdanyola del valles, Spain

UOA-01. **Field Free Switching in Spin-filter Tunnel Devices.** ***(Invited)*** V. Kumar[1], A. Khandelwal[1], Y. Tang[2] and *B. Prasad*[1] *1. Indian Institute of Science, Bengaluru, India; 2. National Central University, Jung-Li, Taiwan*

UOA-02. **Experimental and Theoretical Investigation of Cation Site Occupation and Magnetic Ordering in Co-Ferrite Spinels.** Y. Fang[1], S. Mullurkara[1], K. Taddei[3], G. Wang[1] and *P. Ohodnicki*[1,2] *1. Mechanical Engineering and Materials Science, University of Pittsburgh, Allison Park, PA, United States; 2. Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, United States; 3. Oak Ridge National Laboratory, Knoxville, TN, United States*

UOA-03. **Strain Mediated Control over Magnetization in $CoFe_2O_4$/STO (001) Thin-Film.** G. Channagoudra[1], A. Bagri[2], A. Ahlawat[2], R.J. Choudhary[2], M. Gupta[2] and *V. Dayal*[1] *1. Department of Physics, Maharaja Institute of Technology Mysore (Aff. to VTU Belagavi), Mandya, India; 2. UGC DAE Consortium for Scientific Research, Indore, India*

UOA-04. **Spin-Orbit Torque Generation and Amplification of Spin-Waves in Garnets Micro-Structures.** ***(Invited)*** *A. Anane*[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France*

UOA-05. **Antiferromagnetic domains distribution carried by stoichiometry.** *A. Mandziak*[1], L. Aballe[2], M. Foerster[2], M. Angel[2], J. Prieto[3], C. Granados Miralles[4], A. Quesada[4], A. Berja[4], J. de la Figuera[3] and P. Nita[5] *1. National Synchrotron Radiation Research Center SOLARIS, Cracow, Poland; 2. Alba synchrotron, Cerdanyolla del Valles, Spain; 3. Institute of Chemical Physics 'Rocasolano', Madrid, Spain; 4. Institute of Ceramic and Glass, Madrid, Spain; 5. Physics, Jagiellonian University, Cracow, Poland*

UOA-06. **Resonant microwave absorption in $LaMn_{1-x}Mo_xO_3$ ($0 \leq x \leq 0.1$) investigated using a vector network analyzer.** Y. Lee[1] and *R. Mahendiran*[1] *1. Physics Department, National University of Singapore, Singapore*

UOA-07. **Strain Effects on the Magnetic Ordering in A-type Antiferromagnetic $Pr_{0.5}Sr_{0.5}MnO_3$ Films.** *Y. Chen*[1] and J.G. Lin[1,2] *1. Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan; 2. Center for Atomic Initiatives for New Materials, National Taiwan University, Taipei, Taiwan*

UOA-08. **Observation of Griffith's Phase and Exchange Bias Phenomena in B-site doped 6H Barium Ruthenate.** *P. Santhosh*[1] and M.M. Kurian[1] *1. Physics, IIT Madras, Chennai, India*

UOA-09. **Vibronic excitations in the resonant inelastic x-ray scattering spectra of spin-orbit Mott insulators.** *N. Iwahara*[1], S. Shikano[1] and W. Furukawa[1] *1. Chiba University, Chiba, Japan*

Session UOB
MAGNETIC SEMICONDUCTORS AND METALS

Jaroslav Hamrle, Chair
Charles University in Prague, Prague, Czechia

UOB-01. **A new class of ferromagnetic semiconductors and quantum heterostructures.** ***(Invited)*** *L.D. Anh*[1,2], K. Takiguchi[1], T. Chiba[3] and M. Tanaka[1,4] *1. Dept. of Electrical Engineering and Information Systems, The university of Tokyo, Tokyo, Japan; 2. JST-PRESTO, Saitama, Japan; 3. National Institute of Technology, Fukushima College, Fukushima, Japan; 4. Center for spintronics research network, The University of Tokyo, Tokyo, Japan*

UOB-02. **Magnetic Order in Wurtzite (Ga,Mn)As.** K. Gas[1], J. Sadowski[1] and *M. Sawicki*[1] *1. Institute of Physics, Polish Academy of Sciences, Warszawa, Poland*

UOB-04. **Topological States in Magnetic Pyrochlore Iridates.** ***(Invited)*** *J. Chakhalian*[1] *1. Physics and Astronomy, Rutgers University, Piscataway, NJ, United States*

UOB-05. **Putative Quantum Critical Point in Doped Skyrmion Binary Alloys.** *S. Samatham*[1], S. Shravan Kumar Reddy[1], A.K. Patel[3,2] and K. G. Suresh[2] *1. Department of Physics, Chaitanya Bharathi Institute of Technology, Hyderabad, India; 2. Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Mumbai, India; 3. Research Centre for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Ibaraki, Japan*

UOB-06. **Enhanced anomalous Hall and negative anisotropic magnetoresistance effects driven by *p-d* hybridization with carbon.** *S. Isogami*[1], Y. Kota[2], H. Yasufuku[1], K. Oyoshi[1], M. Tanaka[1] and Y. Takahashi[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. National College of Technology, Fukushima college, Iwaki, Japan*

UOB-07. **Machine Learning Study of Highly Spin-Polarized Heusler Alloys at Finite Temperature.** *I. Kurniawan*[1,2], Y. Miura[1,3] and K. Hono[1,2] *1. Research Center for Magnetic and Spintronics Material, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Graduate School of Science and Technology, University of Tsukuba, Tsukuba, Japan; 3. Center for Spintronics Research Network (CSRN), Graduate School of Engineering Science, Osaka University, Osaka, Japan*

UOB-08. **Magnetotransport properties of Mn_2CoSb.** M. Seredina[1], D. Karpenkov[1], A. Bogach[2], S. Taskaev[3], R.Y. Umetsu[4], X. Xu[5] and *V. Khovaylo*[1] *1. National University of Science and Technology "MISIS", Moscow, Russian Federation; 2. Prokhorov General Physics Institute, Moscow, Russian Federation; 3. Chelyabinsk State University, Chelyabinsk, Russian Federation; 4. Institute for Materials Research, Tohoku University, Sendai, Japan; 5. School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China*

UOB-09. **Competition between two magnetic states in Mn_2YSn (Y =Sc, Ti, and V) Heusler alloys under applied pressure: Ab initio study.** *V.V. Sokolovskiy*[1], M. Zagrebin[1], D. Baigutlin[1] and V. Buchelnikov[1] *1. Condensed Matter, Chelyabinsk State University, Chelyabinsk, Russian Federation*

UOB-10. **Magnetic Properties of Fully-Compensated Ferrimagnet in (Cr,Fe)S Compound with NiAs-Type Structure.** *R.Y. Umetsu*[1], S. Semboshi[1], M. Miyakawa[1], N. Yodoshi[2], A. Masago[3,6], Y. Kawahito[3,5], T. Fukushima[4,6] and H. Akai[5,7] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Graduate School of Engineering, Kyushu University, Fukuoka, Japan; 3. Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan; 4. The Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 5. Graduate School of Engineering, Osaka University, Suita, Japan; 6. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 7. Academeia Co. Ltd., Kashiwa, Japan*

Session UPA
FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA (Poster Session)

Le Anh, Chair
The University of Tokyo, Tokyo, Japan

UPA-01. **Structure, Magnetism and Electrical Transport of Electron Doped $SrCo_{0.5}Nb_{0.5}O_3$.** *M.M. Kurian*[1], P. Santhosh[1] and P. Neenu Lekshmi[2] *1. Physics, IIT Madras, Chennai, India; 2. Institute of Physics for Advanced Materials, Rua do Campo Alegre, Portugal*

UPA-02. **Microstructure and Electron Magnetic Circular Dichroism of Antiphase Boundaries in Magnetic Oxides.** *Z. Li*[1,2] and X. Zhong[1,2] *1. Materials Science and Engineering, City University of Hong Kong, Kowloon, Hong Kong; 2. City University of Hong Kong Matter Science Research Institute (Futian, Shenzhen), Shenzhen, China*

UPA-03. **Probing the structure and magnetic property of Fe doped spinel chromites for memory and spintronic applications.** *A. Yamijala*[1], N. Narasaiah[1], H. Divi[1], D. Dinakar[1], T. Wu[2] and Y. Karampuri[1] *1. National Institute of Technology, Warangal, Warangal, India; 2. Shanghai University, Shanghai, China*

UPA-04. **Band engineering of magnetic semiconductors by phosphorus doping.** O. Yastrubchak[1] and *N. Tataryn*[1] *1. V. E. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*

UPA-05. **Valence Band Dispersion in Mn, Bi and In doped GaAs.** *N. Tataryn*[1] *1. V. E. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine*

UPA-06. **Effect of Crystallinity on Magnetic Properties in Manganese-Doped Indium Tin Oxide Films.** *S. Kitagawa*[1] and T. Nakamura[1,2] *1. Graduate School of Human and Environmental Studies, Kyoto University, Kyoto, Japan; 2. Institute for Liberal Arts and Sciences, Kyoto University, Kyoto, Japan*

UPA-07. **Magnetic Anisotropy Studies of Fe_yN Nanocrystals Embedded in GaN.** *K. Gas*[1], A. Navarro-Quezada[2], T. Truglas[3], V. Bauernfeind[3], M. Matzer[2], D. Kreil[4], A. Ney[2], H. Groiss[3], A. Bonanni[2] and M. Sawicki[1] *1. Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. Institute of Semiconductor and Solid-State Physics, Johannes Kepler University Linz, Linz, Austria; 3. Christian Doppler Laboratory for Nanoscale Phase Transformations, Johannes Kepler University Linz, Linz, Austria; 4. Institute of Theoretical Physics, Johannes Kepler University Linz, Linz, Austria*

UPA-08. **Anisotropic Magnetoresistance Effect in Bulk Single-Crystal Half-Metallic Heusler Alloys.** *T. Tanaka*[3], T. Kubota[1], S. Kokado[2] and R.Y. Umetsu[3,4] *1. Engineering, Tohoku University, Sendai, Japan; 2. Integrated Science and Technology, Shizuoka University, Hamamatsu, Japan; 3. Institute for Materials Research, Tohoku University, Sendai, Japan; 4. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

UPA-09. **High spin-polarization in a disordered novel quaternary Heusler alloy FeMnVGa.** *S. Gupta*[1], C. Barreteau[2], J. Crivello[2], M. Avdeev[3] and C. Mazumdar[1] *1. Condensed Matter Physics Division, Saha Institute of Nuclear Physics, Kolkata, India; 2. Metallurgy and Inorganic Materials, Université Paris-Est, Institut de Chimie et des Matériaux Paris-Est, Paris, France; 3. School of Chemistry, Australian Nuclear Science and Technology Organisation, Sydney, NSW, Australia*

UPA-10. **Withdrawn**

UPA-11. **Study of interplay between magnetic/electric fields and Cr-doped effect in $Mo_{1-x}Cr_xSe_2$ (x=0, 0.5) nanosheet.** Y. Lee[1], T. Tsai[1], *C. Yang*[2], Y. Tung[3] and K. Lin[4] *1. Department of Physics, Chung Yuan Christian University, Chung-Li, Taiwan; 2. Department of Physics, National Central University, Zhongli, Taiwan; 3. Department of Physics, National Sun Yat-sen University, Kaohsiung, Taiwan; 4. Department of Chemical Engineering and Material Science, Yuan Ze University, Chung-Li, Taiwan*

UPA-12. **Field-Induced Spin Nematic Phase of a Magnet on the Shastry-Sutherland Lattice with the Anisotropic Ferromagnetic Interaction.** *T. Sakai*[1] *1. Graduate School of Material Science, University of Hyogo, Ako-gun, Japan*

UPA-13. **Spin Orbital Reorientation Transitions Induced by Magnetic Field.** *D. Sztenkiel*[1] *1. Institute of Physics, Polish Academy of Sciences, Warszawa, Poland*

Session VOA
NANOCRYSTALLINE AND AMORPHOUS SOFT MAGNETS I

Motoki Ota, Co-Chair
Proterial, Ltd., Tokyo, Japan
Naoki Ito, Co-Chair
Proterial, Ltd., Yasugi, Japan

VOA-01. **An Extensive Experimental Study on the Effect of the Main Laser Powder Bed Fusion Process Parameters on the Soft-Magnetic Behavior of Fe-based Bulk Metallic Glasses.** *M.G. Ozden*[1] and N. Morley[1] *1. Material Science and Engineering, The University of Sheffield, Sheffield, United Kingdom*

VOA-02. **Novel FeCoBPSiCr Amorphous Alloy Powder with High B_s of 1.61 T and High Corrosion Resistance.** *H. Matsumoto*[1], A. Hasegawa[1], Y. Kajiura[1], M. Hosono[1], K. Yoshidome[1], H. Ohkubo[2], M. Arata[2], M. Asai[2], E. Hokuto[2] and S. Otska[2] *1. Materials Research Center, TDK Corporation, Narita, Japan; 2. Magnetics Business Group, TDK Corporation, Tsuruoka, Japan*

VOA-03. **Synchrotron radiation X-ray diffraction study on nucleation and growth of nanocrystalline phase in Fe-Si-B-P-Cu-C amorphous alloys.** *S. Hiramoto*[1,2], J. Uzuhashi[3], T. Ohkubo[3], A. Toda[1], C. Moriyoshi[1] and Y. Kuroiwa[1] *1. Graduate School of Advanced Science and Engineering, Hiroshima University, Higashihiroshima, Japan; 2. Tohoku Magnet Institute Co., Ltd., Natori, Japan; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan*

VOA-04. **First order reversal curves as a tool to analyze magnetostatic interactions and coercivity fluctuations in sets of bistable microwires.** A. Cabanas[2], R. Perez Del Real[1], D. Laroze[3] and *M. Vázquez*[1] *1. Institute of Materials Science of Madrid (ICMM-CSIC), Madrid, Spain; 2. Departamento de Física, FACI, Universidad de Tarapacá, Arica, Chile; 3. Instituto de Alta Investigación, Cedenna, Universidad de Tarapacá, Arica, Chile*

VOA-05. **Effect of Applied Stress on Magnetostriction of Amorphous Magnetic Microwires.** V. Zhukova[1,2], M. Churyukanova[3], S. Kaloshkin[3], P. Corte-Leon[1,2], M. Ipatov[1,2] and *A. Zhukov*[1,4] *1. Deptartment Polym. and Advanced Mater., Universidad del País Vasco, San Sebastián, Spain; 2. Dept. Appl. Phys., Universidad del País Vasco, San Sebastian, Spain; 3. Composite materials, National University of Science and Technology, Moscow, Russian Federation; 4. Dept. Appl. Phys., Universidad del País Vasco and Ikervasque, San Sebastian, Spain*

VOA-06. **Formulation of electric voltage for vibration generation device using Magnetostriction Material.** *T. Kawai*[1], E. Ishikawa[1], M. Ohtake[1] and M. Futamoto[1] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan*

VOA-07. **Sintering of NANOMET into Nanocrystalline Soft Magnetic Composite.** *R. Gautam*[1], Z. Kautsar[1], X. Tang[1], H. Mamiya[1], S. Hiramoto[2], T. Miyatake[2], H. Sepehri-Amin[1], T. Ohkubo[1] and K. Hono[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Tohoku Magnet Institute, Natori, Japan*

VOA-08. **Comparative Study of the Magnetic and Magnetotransport Properties of FINEMET Thin Magnetic Wires.** S. Corodeanu[1], C. Hlenschi[1], H. Chiriac[1], T.A. Ovari[1] and *N. Lupu*[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

VOA-09. **Near Zero Magnetostrictive Nanocrystalline Fe-Si-B-Cu-Nb Alloys with a High Heating Rate Annealing.** *K. Toyonaga*[1], Y. Ogawa[1] and N. Ito[1] *1. Proterial, Ltd., Shimane, Japan*

VOA-10. **Improved high permeability CoZrTaB laminated thin films with novel CMOS compatible dielectric material.** G. Wei[1], R. Das[1], D. Lordan[1], *R. Sai*[1], M. Hayes[1], M. Lorenc[1], B. Clarke[2], D. Hurley[2] and P. McCloskey[1] *1. Tyndall National Institute, UCC, Cork, Ireland; 2. TEL Magnetic Solutions, Dublin, Ireland*

VOA-11. **Single domain to vortex state transition in permalloy nanodot arrays prepared by displacement talbot lithography and electrodeposition.** *S. Honnali*[1,2], M. Kutuzau[1,3], N. Kornelius[1,2], H. Reith[1] and K. Leistner[1,3] *1. IFW Dresden, Dresden, Germany; 2. TU Dresden, Dresden, Germany; 3. TU Chemnitz, Chemnitz, Germany*

Session VOB
SOFT MAGNETIC ALLOYS AND OXIDES I

Masaaki Takezawa, Chair
Kyushu Institute of Technology, Kitakyushu, Japan

VOB-01. **Growth-Induced Order by Site-Preference in Anisotropic Mixed Rare-Earth Iron Garnet Thin Films.** *A. Kaczmarek*[1], E. Rosenberg[1,2], Y. Song[1], A. Penn[3], G. Beach[1] and C. Ross[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. 3M Corporate Research Materials Laboratory, 3M Center, St. Paul, MN, United States; 3. MIT.nano, Massachusetts Institute of Technology, Cambridge, MA, United States*

VOB-02. **Effect of YIG nanoparticles addition on the magnetic properties of manganese ferrite.** *S. Che*[1,2], J. Feng[1,2] and Y. Ying[1,2] *1. College of Materials Science and Engineering, Zhejiang University of Technology, Deqing, Huzhou, China; 2. Research Center of Magnetic and Electronic Materials, Zhejiang University of Technology, Deqing, Huzhou, China*

VOB-03. **Powder Injection Molding and Ceramic Injection Molding-like additive manufacturing for prototyping compact cores for power electronics using MnZn ferrites.** *U.M. Soupremanien*[1], V. Martin[2] and F. Gillon[2] *1. CEA-LITEN, Université Grenoble Alpes, Grenoble, France; 2. ULR 2697 - L2EP, Univ. Lille, Arts et Metiers, Centrale Lille, Junia, Lille, France*

VOB-04. **Hysteresis loops of $Lu_{(1-x)}Sr_xFe_{0.5}Cr_{0.5}O_3$ perovskites with x = 0 and x = 0.1.** *F.E. Lurgo*[1], R. Carbonio[2] and O. Billoni[3] *1. Magnetic Resonance Group, INN-CNEA-CONICET, San Carlos de Bariloche, Argentina; 2. Physical Chemistry, INFIQC-CONICET-UNC, Córdoba, Argentina; 3. IFEG-CONICET-UNC, Córdoba, Argentina*

VOB-05. **Accuracy Investigation of High-Frequency Core Loss Measurement for Low-Permability Magnetic Materials.** *Y. Sato*[1], Y. Uehara[2], S. Okamoto[3], S. Yoshida[3], Y. Endo[3], N. Ono[3] and H. Matsumoto[1] *1. Aoyama Gakuin University, Sagamihara, Japan; 2. Magnetic Device Laboratory Ltd., Kawasaki, Japan; 3. Tohoku University, Sendai, Japan*

VOB-06. **A mechanically strong and ductile soft magnet with extremely low coercivity.** *L. Han*[1], F. Maccari[2], O. Gutfleisch[2], Z. Li[3] and D. Raabe[1] *1. Max-Planck-Institut for Eisenforschung, Düsseldorf, Germany; 2. Technical University of Darmstadt, Darmstadt, Germany; 3. Central South University, Changsha, China*

VOB-07. **Increase of Saturation Magnetization Flux Density in Nitrogen Defective $Fe_{16}N_x$.** *Y. Asari*[1], T. Tabata[1], M. Noujima[1], M. Komuro[1] and S. Terada[1] *1. Hitachi, Ltd., Hitachi, Japan*

VOB-08. **Effect of Helical Anisotropy on Magnetic Losses in Stacked Cores of Grain-Oriented and Non-Oriented Steels.** *S. Dobák*[1], J. Fuzer[1], I. Petryshynets[2], P. Kollár[1] and F. Kováč[2] *1. Institute of Physics, Faculty of Science, P. J. Šafárik University in Košice, Košice, Slovakia; 2. Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia*

VOB-09. **Realization of Soft Magnetic Properties in Precipitation Hardening Stainless Steel.** *T. Sato*[1,2], T. Naruse[1], T. Ebata[1] and S. Saito[2] *1. Advanced Material Div., Tohoku Steel Co., Ltd., Murata-machi, Japan; 2. Graduate School of Engineering Department of Electronic Engineering, Tohoku University, Sendai, Japan*

VOB-10. **Magnetic Properties of Fe-Mn-Ni Powders Prepared by Hydrogen Reduction of Wet-Synthesized Ferrite Nanopowders.** J. Nishitsuji[1], R. Okazaki[1], *S. Abe*[1], J. Akamatsu[1], N. Imaoka[1], Y. Kawakami[2], H. Hosokawa[2] and K. Ozaki[2] *1. Nicha Corporation, Anan, Japan; 2. National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

VOB-11. **The effect of temperature on the magnetic properties of Fe/SiO_2/ferrite soft magnetic composites.** *J. Fuzer*[1], S. Vovk[1], S. Dobák[1], P. Kollár[1], R. Bureš[2] and M. Fáberová[2] *1. Institute of Physics, Faculty of Science, P.J. Šafárik University in Košice, Košice, Slovakia; 2. Institute of Materials Research, Slovak Academy of Sciences, Košice, Slovakia*

VOB-12. **Temperature Dependence of Wideband Losses in Fe-Co and Fe-Si Steel Sheets.** N. Banu[1], E. Ferrara[1], L. Rocchino[1], F. Fiorillo[1], *M. Pasquale*[1], D. Brunt[2], A. Wilson[2] and S. Harmon[2] *1. Materials, INRIM, Torino, Italy; 2. National Physical Laboratory, Teddington, United Kingdom*

VOB-13. **The alloying of boron to melt spun Fe-6.5%Si ribbons.** *G. Ouyang*[1], R. Claude[2], A. Kovar[2], M.J. Kramer[1,2], I.E. Anderson[1,2] and J. Cui[2,1] *1. Ames Laboratory, US Department of Energy, Ames, IA, United States; 2. Iowa State University, Ames, IA, United States*

VOB-14. **Evaluation of microstructure and magnetic performance of Fe- 6.5 wt% Si soft magnetic powder core.** *M. Nguyen*[1], S. Yoshida[2], S. Okamoto[2,3], T. Miyazaki[4] and Y. Endo[1,5] *1. Department of Electrical Enginering, Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 3. National Institute for Material Science (NIMS), Tsukuba, Japan; 4. Faculty of Engineering, Tohoku University, Sendai, Japan; 5. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

VOB-15. **Effect of Tensile Stress Application on Magnetic Properties of $Fe_{0.8}Co_{0.2}$ Alloy and Martensitic $Fe_{0.8}Co_{0.2}N_x$ Alloy System.** *T. Tabata*[1], M. Komuro[1], Y. Asari[1], M. Noujima[1] and S. Terada[1] *1. Research & Development Group, Hitachi, Ltd., Hitachi, Japan*

VOB-16. **Magnetic Shielding Materials for Electric Vehicles.** *T. Damatopoulou*[1] *1. NTUA, Athens, Greece*

POSTER SESSION

Session VPA
NANOCRYSTALLINE AND AMORPHOUS SOFT MAGNETS II
(Poster Session)

Takeshi Yanai, Co-Chair
Nagasaki University, Nagasaki, Japan
Tetsuroh Kawai, Co-Chair
Yokohama National University, Japan

VPA-01. **FeNi-based Nanocomposite Soft Magnetic Alloy Magnetic and Mechanical Property Tailoring Through Flash Annealing.** L. Wewer[1], K. Byerly[3], S. Kernion[3] and *P. Ohodnicki*[1,2] *1. Mechanical Engineering and Materials Science, University of Pittsburgh, Pittsburgh, PA, United States; 2. Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, United States; 3. CorePower Magnetics, Pittsburgh, PA, United States*

VPA-02. **Electrically Insulation of FINEMET Powders with a High Resistivity Organosilane Coating to Preserve Magnetic Properties.** *F. Borza*[1], D. Gherca[1], M. Grigoras[1], G. Stoian[1], M. Tibu[1] and N. Lupu[1] *1. National Institute of R&D for Technical Physics, Iasi, Romania*

VPA-03. **Scaling the manufacturing of soft magnetic inductor cores for power conversion applications from 8-inch to 12-inch wafers.** *C. Falub*[1], X. Zhao[2], J.H. Richter[2], H. Rohrmann[1], M. Tschirky[2] and M. Padrun[1] *1. Research & Development, Evatec AG, Trübbach, Switzerland; 2. Business Unit Semiconductors, Evatec AG, Trübbach, Switzerland*

VPA-04. **Microstructure and Magnetic Characterization on Ball-milled Fe-based Nanocrystalline Alloy Sheet.** *S. Nagata*[1], Y. Horibe[1], S. Hiramoto[2], H. Narahara[1], N. Mori[1], I. Sasaki[1], M. Takezawa[1], Y. Ando[1], T. Shikayama[3], S. Mukai[3], S. Maeda[3], S. Sakima[3], T. Ishii[3] and S. Motozuka[1] *1. Kyushu Institute of Technology, Kitakyushu, Japan; 2. Tohoku Magnet Institute, Natori, Japan; 3. Yaskawa Electric Corporation, Kitakyushu, Japan*

VPA-05. **Giant magnetoimpedance effect at GHz frequencies in amorphous microwires.** A. Zhukov[1,2], M. Ipatov[2,3], P. Corte-Leon[2,3], J. Blanco[2,4] and *V. Zhukova*[2,3] *1. Dept. Polym. and Advanced Mater., Universidad del Pais Vasco and Ikerbasque, San Sebastian, Spain; 2. Dept. Appl. Phys., Universidad del Pais Vasco, San Sebastian, Spain; 3. Dept. Polym. and Adv. Mater., Universidad del Pais Vasco, San Sebastian, Spain; 4. EHU Quantum Center, Universidad del Pais Vasco, San Sebastian, Spain*

VPA-06. **Magnetic Properties of High-B_s $Fe_{84.3}B_6P_9Cu_{0.7}$ Nanocrystalline Alloy Powder.** *M. Kuno*[1], N. Onishi[1], M. Yamaki[1], Y. Imano[1] and A. Urata[1] *1. Advanced materials R&D, TOKIN Corporation, Sendai, Japan*

VPA-07. **Fast Propagation and Merger of Magnetic Domain Walls in Low Magnetostrictive Amorphous Submicrometric Wires.** S. Corodeanu[1], C. Hlenschi[1], C. Rotarescu[1], H. Chiriac[1], N. Lupu[1] and *T.A. Ovari*[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

VPA-08. **Heat and current annealing effects on magnetic properties of Fe-rich glass-coated amorphous microwires with different radius.** *A. Gonzalez Villegas*[1,2], P. Corte-Leon[1,2], V. Zhukova[1,2], A. García-Gómez[1,2], M. Ipatov[1,2], J. Gonzalez[1,2], J. Blanco[2] and A. Zhukov[1,2] *1. Advanced Polymers and Materials: Physics, Chemistry and Technology, Universidad del País Vasco, San Sebastian, Spain; 2. Dpto. de Física Aplicada, EIG, Universidad del País Vasco, San Sebastian, Spain*

VPA-09. **Fabrication of Fe-based nanocrystalline powder-pressed magnetic core with low coercivity and small iron loss.** T. Kanaya[1], *R. Ohta*[1], M. Sonehara[1] and T. Sato[1] *1. Electrical and Computer Engineering, Shinshu University, Nagano, Japan*

VPA-10. **Magnetic Domain Observation of Milled Nanocrystalline Alloy Powder.** *M. Takezawa*[1], T. Nagaki[1], S. Motozuka[1], I. Sasaki[1,2], Y. Ando[1], H. Narahara[1], N. Mori[1], T. Shikayama[2], S. Mukai[2], S. Maeda[2], S. Sakima[2] and T. Ishii[2] *1. Kyushu Institute of Technology, Kitakyushu, Japan; 2. Yaskawa Electric Corporation, Kitakyushu, Japan*

VPA-11. **Magnetic Loss Modeling of Nanocrystalline Cores Considering Stack Thickness.** W. Meng[1], *Y. Li*[1], C. Zhang[1], H. Sun[1] and Z. Wan[1] *1. Hebei University of Technology, Tianjin, China*

VPA-12. **Anomalous magnetic anisotropy behaviour in Co-rich and Fe-rich glass-coated microwires under applied stress.** *A. García-Gómez*[1,2], J. Blanco[1,2], P. Corte-Leon[1,2], M. Ipatov[1,2], A. Gonzalez Villegas[1,2], J. Gonzalez[1,2], A. Zhukov[1,2] and V. Zhukova[1,2] *1. Polymers and Advanced Materials: Physics, Chemistry and Technology, University of the Basque Country UPV/EHU, Donostia-San Sebastián, Spain; 2. Applied Physics Departement, University of the Basque Country UPV/EHU, Donostia-San Sebastián, Spain*

VPA-13. **Two-Dimensional Magnetostrictive Characteristics of Amorphous and Permendur Electric Power Magnetic Materials.** *M. Enokizono*[1,2] and D. Wakabayashi[2] *1. Vector magnetic characteristic technical laboratory, Usa, Japan; 2. Mechanical Electric Engineering, Nippon Bunri University, Oita, Japan*

VPA-14. **Structural Phase Transformation and Magnetic Properties Induced by Thermal Analysis with Different Gaseous Environments in Iron-Doped Manganese Oxide Nanoparticles.** *L. Huang*[1], Y. Chen[1], Z. Huang[1], P. Chuang[1], A. Spivakov[1] and C. Lin[1] *1. Department of Applied Physics, National Pingtung University, Pingtung, Taiwan*

POSTER SESSION

Session VPB
SOFT MAGNETIC ALLOYS AND OXIDES II (Poster Session)

Jan Fuzer, Chair
P.J. Safarik University, Kosice, Slovakia

VPB-01. **Jiles-Atherton's parameters as a functions of temperature.** *T. Shirane*[1] *1. National Institute of Technology, Sendai College, Sendai, Japan*

VPB-02. **One-pot solvothermal synthesis of dispersed Fe_3O_4 nanoparticles decorated on graphene oxide for magnetic hyperthermia.** *R. Lamouri*[1] and K. Kim[1] *1. Physics, Yeungnam University, Gyeongsan, The Republic of Korea*

VPB-03. **Analysis on Iron Loss of Sendust Dust Cores based on Magnetization Reversal Processes.** *N. Ono*[1], Y. Uehara[2], Y. Endo[3,4], S. Yoshida[1], N. Kikuchi[1] and S. Okamoto[1,5] *1. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 2. Magnetic Device Laboratory Ltd., Kawasaki, Japan; 3. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 4. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 5. National Institute for Materials Science, Tsukuba, Japan*

VPB-04. **Tailoring of Surface Roughness and B2 Ordering in $Fe_{50}Co_{50}$ Single-Crystal Film for Enhancement of Magnetostriction.** *Y. Nakamura*[1], M. Ohtake[1], T. Kawai[1], M. Futamoto[1] and N. Inaba[2] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

VPB-05. **PLD-fabricated Fe-Co films prepared by using different spot size of laser beam.** *A. Yamashita*[1], H. Kaku[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan*

VPB-06. **Cold Workability and Magnetic Properties of FeCo-V Alloys with the Addition of a Small Amount of Aluminum.** *K. Urakawa*[1,2], M. Kasuya[3], S. Sato[4], K. Kanie[1], N. Owari[2], T. Ebata[2] and S. Suzuki[5] *1. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 2. Tohoku Steel Co., Ltd., Murata-machi, Japan; 3. Faculty of Production Systems Engineering and Sciences, Komatsu University, Komatsu, Japan; 4. Graduate School of Science and Engineering, Ibaraki University, Hitachi, Japan; 5. Micro System Integration Center, Tohoku University, Sendai, Japan*

VPB-07. **Synthesis and characterization of single phase γ-$Co_{47}Ni_{22}Al_{31}$ Heusler alloy nanoparticles.** *D. Mahata*[1] and A. Srinivasan[1] *1. Physics, IIT Guwahati, Guwahati, India*

VPB-08. **Effect of Annealing Temperature on Structure and Magnetic Properties of Ultra-thin High-Purity Iron Ribbons.** *X. Ma*[1], R.Y. Umetsu[2], T. Miyazaki[3], S. Mikami[4], T. Hiraki[4] and Y. Endo[1,5] *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Faculty of Engineering, Tohoku University, Sendai, Japan; 4. R&D, TOHO ZINC Co, Ltd, Tokyo, Japan; 5. Center for Science and Innovation in Spintronics(CSIS), Tohoku University, Sendai, Japan*

VPB-09. **Feature analysis on B-H curves of dust cores under the application of DC bias field.** *T. Onuma*[1], Z. Li[1] and S. Okamoto[1,2] *1. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics (CSIS), Tohoku University, Sendai, Japan*

VPB-10. **Anisotropic FMR Peak Widths in Fe-Co Single Crystal Thin Films.** S. Umetsu[1], M. Sato[1], Y. Takahashi[1], *N. Inaba*[1], F. Kirino[2], M. Ohtake[3] and M. Futamoto[3] *1. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan; 2. Tokyo University of the Arts, Tokyo, Japan; 3. Yokohama National University, Yokohama, Japan*

VPB-11. **Measurement and Evaluation of Magnetic Barkhausen Noise of Oriented Silicon Steel Sheet under Mechanical Stress.** *Y. Yao*[1] and L. Li[1] *1. State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources, North China Electric Power University, Beijing, China*

VPB-12. **Thickness Dependent Magnetic Properties of Electrodeposited Co_2FeSn Films.** *P. Pathak*[1] and A. Srinivasan[1] *1. Physics, IIT Guwahati, Guwahati, India*

VPB-13. **Study on the Effect of Cutting Process on the Magnetic Properties of Electrical Steel with Different Si Content for Motor.** *D. Ma*[1], B. Tian[1], Y. Li[1], H. Hu[1], Y. Ma[1] and R. Pei[1] *1. Department of electrical Engineering, Shenyang University of Technology, Shenyang city, China*

VPB-14. **Crossed Anisotropy Multilayered Nanogranular Films Combining High Permeability, Ferromagnetic Resonance Frequency, and Resistivity.** *M. Naoe*[1], M. Sonehara[2], K. Miyaji[2], T. Sato[2], Y. Endo[3], N. Kobayashi[1] and K. Arai[1] *1. Research Institute for Electromagnetic Materials, Tomiya, Japan; 2. Shinshu University, Nagano, Japan; 3. Tohoku University, Sendai, Japan*

Session WOA
HARD MAGNETIC MATERIALS I

Thibaut Devillers, Chair
Institut Néel CNRS, Grenoble, France

WOA-01. **Understanding the Coercivity of Ga-containing Nd-Fe-B Sintered Magnets from Feature Extraction and Selection of X-ray Diffraction Patterns by Dimension Reduction and Sparse Modelling.** ***(Invited)*** *K. Ishigami*[1,2], T. Onuma[1,2], A. Kato[3,2], M. Yano[3,2], T. Shoji[3,2], T. Nakamura[4,2] and S. Okamoto[1,2] *1. Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Sendai, Japan; 2. Digital Transformation Initiative Center for Magnetic Materials (DXMag), National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Advanced Material Engineering Division, Toyota Motor Corporation, Susono, Japan; 4. International Center for Synchrotron Radiation Innovation Smart (SRIS), Tohoku University, Sendai, Japan*

WOA-02. **Tomography-based Digital Twins of Nd-Fe-B Magnets for Micromagnetic Simulations.** *A. Bolyachkin*[1,2], E. Dengina[2,3], N. Kulesh[2], X. Tang[2,1], H. Sepehri-Amin[2,3], T. Ohkubo[2] and K. Hono[2,3] *1. International Center for Young Scientists, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan*

WOA-03. **Magnetic Hardening of Neodymium-lean Permanent Magnets by Local Replacement of Grains by High Anisotropy Phases.** *J. Fischbacher*[1,2], H. Oezelt[1,2], A. Kovacs[1,2], Q. Ali[1,2], M. Yano[3], N. Sakuma[3], A. Kinoshita[3], T. Shoji[3], A. Kato[3] and T. Schrefl[1,2] *1. Department for Integrated Sensor Systems, University for Continuing Education Krems, Wiener Neustadt, Austria; 2. Christian Doppler Laboratory for magnet design through physics informed machine learning, University for Continuing Education Krems, Wiener Neustadt, Austria; 3. Advanced Materials Engineering Division, Toyota Motor Corporation, Susono, Japan*

WOA-04. **Development of Dy-free sintered NdFeB magnet through grain boundary engineering by diffusion of PrCu alloys.** *W. Tang*[1], G. Ouyang[1], J. Wang[1], H. Dasari[2], M.J. Kramer[1], J. Cui[1,2] and I.E. Anderson[1,2] *1. Ames Laboratory, US Department of Energy, Ames, IN, United States; 2. Materials Science & Engineering, Iowa State University, Ames, IA, United States*

WOA-05. **High resistivity anisotropic hot-deformed Nd-Fe-B magnets prepared from DyF_3 electrophoretic deposited powders.** *Z. Kautsar*[1,2], H. Sepehri-Amin[1,2], X. Tang[2,3], R. Iguchi[2], K. Uchida[2,4], T. Ohkubo[2] and K. Hono[1,2] *1. Graduate School of Science and Technology, University of Tsukuba, Tsukuba, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. International Center for Young Scientist, National Institute for Materials Science (NIMS), Tsukuba, Japan; 4. Institute for Materials Research, Tohoku University, Sendai, Japan*

WOA-06. **Nd-Fe-B Hydrogenation-Disproportionation-Dehydrogenation-Recombination (HDDR) magnet for variable magnetic flux motor.** *K. Takeda*[1], S. Miyazaki[1], T. Kajita[1] and Y. Enokido[1] *1. Technology & Intellectual Property HQ, TDK Corporation, Narita, Japan*

WOA-07. **Withdrawn**

WOA-08. **Withdrawn**

WOA-09. **(Nd, LRE)-Fe-B hot-deformed magnets for application of variable-magnetic-force motors.** *X. Tang*[1], H. Sepehri-Amin[1], A. Bolyachikin[1], T. Ohkubo[1] and K. Hono[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan*

WOA-10. **Unconventional Alloy Design for the Additive Manufacturing of (Pr, Nd)-Fe-B based Permanent Magnets.** L. Schäfer[1], K. Skokov[1], F. Maccari[1], D. Koch[1], E. Adabifiroozjaei[1], L. Molina-Luna[1] and *O. Gutfleisch*[1] *1. Materials Science, Technical University Darmstadt, Darmstadt, Germany*

WOA-11. **Effect of Nd-Cu Doping on the Grain Alignment and Magnetic Properties of Ce-Fe-B Hot-deformed Magnets.** *H. Choi*[1,2], H. Cha[1], H. Choi-Yim[2] and J. Lee[1] *1. Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. Sookmyung Women's University, Seoul, The Republic of Korea*

WOA-12. **Achieving 2.8 T coercivity in Nd–Fe–B sintered magnets subjected to DyCu and PrCu grain boundary diffusion process.** ***(Invited)*** Z. Wang[1], *T. Sasaki*[1], Y. Une[2], T. Ohkubo[1] and K. Hono[1] *1. National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Daido Steel Co. Ltd., Nagoya, Japan*

WOA-13. **Dual-main-phase Ce magnets designed by two main phases with different magnetocrystalline anisotropy: the effect of Ce chemical state.** *M. Zhu*[1], Q. Sun[1], Y. Fang[1] and W. Li[1] *1. Central Iron & Steel Research Institute, Beijing, China*

WOA-14. **Achievement of 2.3T Coercivity in HRE-free Nd-Fe-B Sintered Magnets *via* TaF_5-$Pr_{70}Cu_{15}Al_{10}Ga_5$ Two-step Infiltration.** *S. Lee*[1,2], T. Kim[1], S. Lee[3], D. Kim[3], W. Lee[2] and J. Lee[1] *1. Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. Yonsei University, Seoul, The Republic of Korea; 3. Star group Ind. Co., Deagu, The Republic of Korea*

Session WOB
HARD MAGNETIC MATERIALS II

Lars Daniel Hedlund, Chair
Northeastern University, Boston, MA, United States

WOB-01. **Restricted grain growth and role of Nb precipitates in Nd-Fe-Nb-B melt spun ribbon.** *B. Muni*[1,2], P. Delhi Babu[2], M. Sadhashivam[1], K. Pradeep[1], G. Sundararajan[1,2] and R. Gopalan[2,1] *1. Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India; 2. CAEM, International Advanced Research Centre for Powder Metallurgy and New Materials, Chennai, India*

WOB-02. **Modeling the Impact of Laser Powder Bed Fusion on Nd-Fe-B Permanent Magnets.** *J. Thielsch*[1], F. Bittner[1] and W. Drossel[1,2] *1. Fraunhofer Institute for Machine Tools and Forming Technology IWU, Dresden, Germany; 2. Chemnitz University of Technology, Chemnitz, Germany*

WOB-03. **Development of recycling friendly coatings for Nd-Fe-B magnets.** *B. Podmiljsak*[1], L. Grau[2], C. Burkhardt[2] and S. Kobe[1] *1. Institut Jozef Stefan, Ljubljana, Slovenia; 2. Institute for Precious and Technology Metals, Pforzheim, Germany*

WOB-04. **High magnetic performance of Nd–Fe–B sintered magnets by grain boundary diffusion with LRE-Al-Cu (LRE= La, Nd, and Pr,) alloys.** *J. Ryeong*[1], H. Lee[2], H. Lee[1] and W. Lee[1] *1. Department of Materials Science and Engineering, Yonsei University, Seodaemun-gu, The Republic of Korea; 2. Hyundai Motor Company, Hwaseong, The Republic of Korea*

WOB-05. **Influence of filler fraction and morphology on magnetic performance of polymer bonded magnets produced by laser powder bed fusion. *(Invited)*** *K. Schäfer*[1], T. Braun[1], S. Riegg[1], J. Musekamp[2] and O. Gutfleisch[1] *1. Materials Science, Functional Materials, Darmstadt, Germany; 2. Institute for Materials Technology, Darmstadt, Germany*

WOB-06. **Low-temperature Manufacturable, Recyclable and Reconfigurable Liquid-metal Bonded NdFeB Magnets.** *R. Zhao*[2,1], H. Wang[2], Y. Shi[2], Z. Zhu[3,4] and B. Zhang[5] *1. Quanzhou Institute of Equipment Manufacturing of Haixi Institutes, Chinese Academy of Sciences, Quanzhou, China; 2. Zhongyuan-Petersburg Aviation Colledge, zhongyuan University of Technology, Zhengzhou, China; 3. Nanchang Institute of Technology, Nanchang, China; 4. Zhejiang Sci-Tech University, Hangzhou, China; 5. Henan University of Animal Husbandry and Economy, Zhengzhou, China*

WOB-07. **Cu-containing $SmFe_{12}$-based sintered magnets with high coercivity.** *S. Ashok Krishnaswamy*[1,2], X. Tang[2], H. Sepehri-Amin[1,2], J. Zhang[2], T. Ohkubo[2] and K. Hono[1,2] *1. University of Tsukuba, Tsukuba, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

WOB-08. **Grain boundary engineering of Nd-based $ThMn_{12}$ magnets and their nitrides.** *A. Aubert*[1], X. Liao[1], F. Maccari[1], S. Riegg[1], S. Ener[1], E. Adabifiroozjaei[1], T. Jiang[1], L. Molina-Luna[1], K. Skokov[1] and O. Gutfleisch[1] *1. TU Darmstadt, Darmstadt, Germany*

WOB-09. **Magnetic Properties and Phase Transformation of Sm-Fe-Co-X (X = Ga, V, B, Si, and Ti) Permanent Magnetic Materials.** *C. Choi*[1], T. Zhou[1], K. Jong-Woo[2] and j. Park[1] *1. Powder Materials Division, Korea Institute of Materials Science, Changwon, The Republic of Korea; 2. Ceramic Materials Division, Korea Institute of Materials Science, Changwon, The Republic of Korea*

WOB-10. **Energy based model for twin boundary prediction in Sm-Fe-Co 1:12.** *G. Hrkac*[1], C. Skelland[1] and T. Schrefl[2] *1. Engineering, University of Exeter, Exeter, United Kingdom; 2. University for Continuing Education Krems, Krems, Austria*

WOB-11. **Microstructural features of strip-cast $Nd(Fe,Mo)_{12}$ based alloys.** *S. Luca*[1], C. Flament[1], R. Sedek[1,2] and P. De Rango[2] *1. Univ. Grenoble Alpes, CEA, Liten, DTNM, Grenoble, France; 2. Univ. Grenoble Alpes, CNRS, Institut Neel, Grenoble, France*

WOB-12. **Magnetic properties enhancement and microstructures in anisotropic $Sm(Fe,Ti,V)_{12}$-based sintered magnets.** *J. Zhang*[1], X. Tang[1], A. Bolyachkin[1], S. Ashok Krishnaswamy[1,2], H. Sepehri-Amin[1], T. Ohkubo[1] and K. Hono[1,2] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Graduate School of Science and Technology, University of Tsukuba, Tsukuba, Japan*

WOB-13. **Development of $TbCu_7$-type Sm-Fe-N anisotropic magnet powder by low-temperature build-up process using molten salt.** *S. Sato*[1], E. Node[2] and S. Okada[2] *1. Materials Research Center, Technology & IP HQ, TDK corporation, Narita, Japan; 2. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

WOB-14. **Sm-Fe Binary Phases Synthesized at Low temperature by Reduction-Diffusion Process.** *J. Kim*[1], S. Okada[1], K. Takagi[1] and K. Ozaki[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

ORAL SESSIONS

Session WOC
HARD MAGNETIC MATERIALS III

Hisashi Maehara, Co-Chair
Nichia Corporation, Anan-shi, Japan
Hiroaki Kura, Co-Chair
Denso Corporation, Kariya, Japan

WOC-01. **Preparation of Sm-Fe-N hard magnetic nanopowder from micron-sized Sm-H and Fe mixed powder.** *Y. Hirayama*[1], L. Zheng[1], W. Yamaguchi[1], K. Takagi[1] and K. Ozaki[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

WOC-02. **Effects of Nb and B addition on intrinsic magnetic properties and phase on $TbCu_7$-type Sm-Fe-Co-Nb-B alloy.** N. Kurokawa[1], *M. Matsuura*[1], S. Sakurada[2] and S. Sugimoto[1] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Toshiba Corporation, Kawasaki, Japan*

WOC-03. **Direct consolidation of $Sm_2Fe_{17}N_3$ magnet and coercivity improvement by severe plastic deformation.** *A. Hosokawa*[1] and Y. Hirayama[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

WOC-04. **Development of $Sm_2Fe_{17}N_3$ magnetic powder doped with La, W, and Ti.** *H. Maehara*[1] and M. Kume[1] *1. Magnet Material Development, NICHIA CORPORATION, Anan-shi, Japan*

WOC-05. **Evaluation of Practicality for Fully Dense Isotropic Sm-Fe-N Magnets Made by Shock-Wave Consolidation Method.** S. Takagi[1], K. Morii[1], *T. Iriyama*[1], K. Tominaga[2], N. Wada[2], E. Hida[2] and Y. Yamada[2] *1. Corporate R&D Center, Daido Steel Co., Ltd., Nagoya, Japan; 2. Explosives Division, ASAHI KASEI CORPORATION, Chikushino, Japan*

WOC-06. **Effect of Mn doping on magnetic properties, magnetic domain structures and microstructures of 2-17 type Sm-Co magnets.** *H. Machida*[1], T. Fujiwara[1], C. Fujimoto[1], Y. Kanamori[1], K. Inoue[2] and M. Takezawa[2] *1. TOKIN Corporation, Sendai, Japan; 2. Kyushu Institute of Technology, Kitakyushu, Japan*

WOC-07. **The role of initial defect on the cellular structure evolution in Fe-rich Sm_2Co_{17}-type magnets.** *Q. Li*[1,2] and Y. Fang[1] *1. Central Iron & Steel Research Institute, Beijing, China; 2. University of Science and Technology Beijing, Beijing, China*

WOC-08. **Anomalous Reduction in Magnetization of $Sm_2Fe_{17}N_3$ Anisotropic Sintered Magnets during Pressure Current Sintering.** *W. Yamaguchi*[1], A. Hosokawa[1] and K. Takagi[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

WOC-09. **Mechanism for Strengthening High-Performance Sm-Co Magnets.** *C.I. Nlebedim*[1], X. Liu[1], J. Cui[1,2] and B. Cui[1] *1. Critical Materials Institute, Ames Laboratory, US Department of Energy, Ames, IA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States*

WOC-10. **An Atomistic Study of Plastic Deformation of $SmCo_5$ by Amorphous Shear Bands.** *N. Wang*[1,2], H. Luo[2,3], L. Liu[2,3], Y. Ding[2,3], R. Chen[2,3], X. Zhang[1], X. Yao[1], I. Szlufarska[4] and A. Yan[2,3] *1. Shanxi Key Laboratory of Biomedical Metal Materials, College of Materials Science and Engineering, Taiyuan University of Technology, Taiyuan, China; 2. Joint Innovation Center for Rare Earth Permanent Magnets, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China; 3. Key Laboratory of Magnetic Materials and Devices, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China; 4. Department of Materials Science and Engineering, University of Wisconsin, Madison, WI, United States*

WOC-11. **Heat treatment effect on magnetic properties of Sm-Co nanopowder prepared by induction thermal plasma process.** *K. Park*[1] and Y. Hirayama[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

WOC-12. **Mechanical and Magnetic Properties of Additive Particulate-modified Sm–Co Sintered Magnets.** *B. Cui*[1], X. Liu[1], C.I. Nlebedim[1] and J. Cui[1] *1. Ames Laboratory, US Department of Energy, Ames, IA, United States*

WOC-13. **A machine learning assisted high throughput study of NdCeLaFeB films.** *Y. Hong*[1], S. Grenier[1], T. Devillers[1], A. Kovacs[2,3], H. Oezelt[2,3], M. Yano[4], N. Sakuma[4], A. Kinoshita[4], T. Shoji[4], A. Kato[4], T. Schrefl[2,3] and N. Dempsey[1] *1. Institut Néel CNRS, Grenoble, France; 2. Christian Doppler Laboratory for magnet design through physics informed machine learning, Danube University Krems, Wiener Neustadt, Austria; 3. Department for Integrated Sensor Systems, Danube University Krems, Wiener Neustadt, Austria; 4. Advanced Materials Engineering Div., Toyota Motor Corporation, Mishuku Susono, Japan*

WOC-14. **Recycling and Enrichment of Rare Earth Based Permanent Magnet Scraps.** *D. Celebi*[1], S. Ghorbanighoshchi[1], N. Gunduz Akdogan[2] and O. Akdogan[1] *1. Bahcesehir University, Istanbul, Turkey; 2. Piri Reis University, Istanbul, Turkey*

ORAL SESSIONS

Session WOD
HARD MAGNETIC MATERIALS IV

Yusuke Hirayama, Chair
National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

WOD-01. **Generalised Form of the Magnetic Anisotropy Field in Micromagnetic and Atomistic Spin Models.** *J.B. Collings*[1], R. Rama-Eiroa[2,3], S. Jenkins[1], R. Otxoa[4], R.F. Evans[1] and R.W. Chantrell[1] *1. University of York, York, United Kingdom; 2. Donastia International Physics Centre, San Sebastian, Spain; 3. Polymers and Advanced Materials Department: Physics, Chemistry, and Technology, University of the Basque Country, UPV/EHU, San Sebastian, Spain; 4. Hitachi Cambridge Laboratory, Cambridge, United Kingdom*

WOD-02. **Experimental Determination of Anisotropy Fields, First and Second Anisotropy Constants, and Remanent Magnetizations in Self-Polarized Zn-Ti and Co-Ti Equally Co-Substituted BaM Ferrites.** A. Hoez[1], A. Chevalier[1] and *J. Mattei*[1] *1. Université de Bretagne Occidentale, Brest, France*

WOD-03. **Highly Coercive Ferrite Nanocomposite Powder with Enhanced Thermal Stability and No-content of Critical Raw Elements.** *A. Bollero*[1], A. Fernández-Calzado[1], E.M. Palmero[1], C.M. Montero[1], S. Ener[2], O. Gutfleisch[2], D. Makovec[3], J. Grenèche[4] and P. Bernardi[5] *1. Group of Permanent Magnets and Applications, IMDEA Nanoscience, Madrid, Spain; 2. Functional Materials, Material Science, TU Darmstadt, Darmstadt, Germany; 3. Department for Materials Synthesis, Jozef Stefan Institute, Ljubljana, Slovenia; 4. Institut des Molécules et Matériaux du Mans, Le Mans Université, Le Mans, France; 5. Industrie ILPEA Spa, Malgesso-Varese, Italy*

WOD-04. **Magnetic properties of α″-$Fe_{16}N_2$ nanopowder.** *T. Saito*[1] and H. Yamamoto[2] *1. Chiba Institute of Technology, Narashino, Japan; 2. NEOJI-CONSUL, Kyoto, Japan*

WOD-05. **Quadrupole electronic structures in $Mn_{3-\delta}Ga$ thin films studied by XMLD and ARPES.** *J. Okabayashi*[1], Y. Miura[2], K. Tanaka[3], K. Suzuki[4] and S. Mizukami[5] *1. University of Tokyo, Tokyo, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Institute for Molecular Science, Aichi, Japan; 4. JAEA, Ibaraki, Japan; 5. Tohoku Univ., Sendai, Japan*

WOD-06. **Optimisation of Ga-doped τ-MnAl for use as a permanent magnetic material.** *E.V. Davis-Fowell*[1], N. Morley[1], D. Allwood[1] and R. Goodall[1] *1. Department of Material Science and Engineering, The University of Sheffield, Sheffield, United Kingdom*

WOD-07. **Production of a single crystalline ε-MnAl powder precursor material.** F. Jürries[1,2], B. Lukas[1,3], N. Kornelius[1,2] and *T. Woodcock*[1] *1. Leibniz Institute for Solid State and Materials Research (IFW) Dresden, Dresden, Germany; 2. TU Dresden, Dresden, Germany; 3. TU Bergakademie Freiberg, Freiberg, Germany*

WOD-08. **Towards the Industrial Production of MnAlC as a Rare Earth-free Permanent Magnet Alternative: Coercivity Development in Cast and Milled MnAlC Alloy.** *A. Martín-Cid*[1], J. Vergara-Ortega[1], C. Muñoz Rodriguez[1], E.M. Palmero[1], G. Qin[2], C. Hall[2], E. Forlin[3], L. Bianchin[3], S. Ener[4], O. Gutfleisch[4] and A. Bollero[1] *1. IMDEA nanociencia, Madrid, Spain; 2. Less Common Metals Ltd., Ellesmere Port, United Kingdom; 3. MBN Nanomaterialia S.p.A, Vascon di Carbonera, Italy; 4. Technical University of Darmstadt, Darmstadt, Germany*

WOD-09. **Magnetic, physical and chemical properties of consolidated Mn-Al-C bulk magnets.** *S. Ener*[1], U. Rocabert[1], F. Maccari[1], A. Aubert[1], G. Qin[2], A. Martín-Cid[3], A. Bollero[3] and O. Gutfleisch[1] *1. Functional Materials, TU Darmstadt, Darmstadt, Germany; 2. Less Common Metal Ltd., Cheshire, United Kingdom; 3. IMDEA Nanociencia, Madrid, Spain*

WOD-10. **BH curves of Anisotropic Alnico Magnets.** *A. Ibrayeva*[1], E. Lind[1], M. Silva[1], S. Ghorai[2] and S. Eriksson[1] *1. Electrical Engineering, Uppsala University, Uppsala, Sweden; 2. Material Science and Engineering, Uppsala University, Uppsala, Sweden*

WOD-11. **Withdrawn**

WOD-12. **Exploration of functional properties of all-3d transition metal Heusler alloys.** *M. Marathe*[1] and H.C. Herper[1] *1. Department of physics and astronomy, Uppsala University, Uppsala, Sweden*

WOD-13. **Magnetic properties of monoclinic Fe_3Se_4 doped with transition metals.** A. Alsaad[1], H. Zeng[2], N. Alaqtash[4] and *R. Sabirianov*[3] *1. Physics, Jordan University of Science and Technology, Irbid, Jordan; 2. Physics, SUNY Buffalo, Buffalo, NY, United States; 3. Physics, University of Nebraska at Omaha, Omaha, NE, United States; 4. Hashemite University, Zarqa, Jordan*

WOD-14. **Fabrication of $L1_0$-FeNi from compositional optimized amorphous alloys.** *Y. Wang*[1], Y. Zhang[2], Z. Hao[1] and C. Cao[1] *1. Northwestern Polytechnical University, Xi'an, China; 2. Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China*

WOD-15. **Development of Hard Magnetic Composite MnAlC / Hydrogel Inks for Manufacturing Alternative Permanent Magnets by 3D-Printing.** Z. Curbelo-Cano[1], *E.M. Palmero*[1], C.M. Montero[1], J. de Vicente[1] and A. Bollero[1] *1. Group of Permanent Magnets and Applications, IMDEA Nanociencia, Madrid, Spain*

POSTER SESSION

Session WPA
HARD MAGNETIC MATERIALS V
(Poster Session)

Nora Dempsey, Chair
Institut Néel CNRS, Grenoble, France

WPA-01. **Contribution of Nd-rich alloys to the multi-main-phase LaCe-based sintered magnets with high coercivity.** *H. Chen*[1], W. Liu[1], Y. Li[1], H. Zhang[1] and M. Yue[1] *1. Beijing University of Technology, Beijing, China*

WPA-02. **Effect of Phosphate Treatment on Corrosion Resistance of Nd-Fe-B Anisotropic Magnetic Powder.** *K. Shimba*[1], M. Yamazaki[1], S. Sugimoto[2] and H. Mitarai[1] *1. Aichi Steel Corporation, Tokai, Japan; 2. Tohoku University, Sendai, Japan*

WPA-03. **DEM simulation of the single-directional pressed and double-directional pressed Nd-Fe-B compacts.** *K. Zhu*[1], X. Bao[1], J. Li[1], S. Guan[1] and X. Gao[1] *1. State Key Laboratory for Advanced Metals and Materials, University of Science and Technology Beijing, Beijing, China*

WPA-04. **Solidification Characteristics and Microstructure Evolutions of $RE_2Fe_{14}B$(RE=Ce, Y, La)Alloys.** *A. Li*[1], H. Feng[1], W. Yang[1] and W. Li[1] *1. Division of Functional Materials, Central Iron & Steel Research Institute, Beijing, China*

WPA-05. **Coercivity enhancement of NdFeB sintered magnets by grain boundary diffusion with $Tb_{75-x-y}Al_xCe_yCu_{20}Zn_5$ alloy powders (x= 0-40; y= 0-25).** *Y. Wong*[1], H. Chang[1] and W.C. Chang[1] *1. Physics, National Chung Cheng University, ChiaYi, Taiwan*

WPA-06. **Comparison on the coercivity enhancement of hot-deformed NdFeB magnets by doping $Ce_{80}M_{20-x}Zn_x$ (M= Cu, Al; x= 0-20) alloy powders.** H. Chang[1], *Y. Wong*[1], P. Lin[1] and W.C. Chang[1] *1. Physics, National Chung Cheng University, ChiaYi, Taiwan*

WPA-07. **Coercivity and Surface Morphology of Pr-Fe-B Thicker Films at Elevated Temperature.** A. Sun[1] and *L.T. Tran*[1] *1. Yuan Ze University, Taoyuan, Taiwan*

WPA-08. **The effect of annealing temperature on grain boundary structure and magnetic properties of Nd-Ce-Gd-Fe-B sintered magnet.** *H. Yu*[1], X. Bao[1], S. Guan[1], J. Li[1] and X. Gao[1] *1. University of Science and Technology Beijing, Beijing, China*

WPA-09. **Preparation of Nd–Fe–B thick-film magnets by vacuum arc deposition for device applications.** *K. Otsuka*[1], T. Motomura[1], A. Yamashita[1], T. Yanai[1], H. Fukunaga[1], K. Nagai[2], T. Shinshi[2] and M. Nakano[1] *1. Nagasaki University, Nagasaki, Japan; 2. Tokyo Institute of Technology, Yokohama, Japan*

WPA-10. **Phase Stability and Magnetic Properties in Pr-Fe-(C, B) System.** *Z. Bai*[1], H. Zhang[1], E. Fu[1], W. Liu[1] and M. Yue[1] *1. Beijing University of Technology, Beijing, China*

WPA-11. **Electronic Structure of NdFeCoB Oxide Magnetic Particles with Different Contents of Co.** *V.Y. Samardak*[1], A. Komissarov[1,2], A. Dotsenko[2], V. Korochentsev[1,2], I. Osmushko[1,2], A. Belov[1], P. Mushtuk[1], V. Antonov[1], G. Ahmadpour[3], F. Nasirpouri[3], A. Samardak[1] and A. Ognev[1] *1. Laboratory of Spin-Orbitronics, Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Laboratory of Electronic Structure and Quantum Chemical Modeling, Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 3. Faculty of Materials Engineering, Sahand University of Technology, Tabriz, The Islamic Republic of Iran*

WPA-12. **Effect of Hot Pressure Condition on the Magnetic Performance of ($Nd_{0.6}Ce_{0.4}$)-Fe-B Hot-deformed Magnets.** *W. Kim*[1], Y. Jang[1], H. Lee[1], P. Choi[1], K. Shin[1] and W. Lee[1] *1. Department of Materials Science & Engineering, Yonsei University, Seoul, The Republic of Korea*

WPA-13. **PLD-fabricated (Nd or Pr)–Fe–B Thick-film Magnets Applied to Small Stepping Motors.** K. Kono[1], *M. Sakuragi*[1], A. Yamashita[1], T. Yanai[1], H. Fukunaga[1] and M. Nakano[1] *1. Nagasaki University, Nagasaki, Japan*

WPA-14. **Spin Glass Interface Mediates Intergranular Exchange in $Nd_2Fe_{14}B$.** *J.B. Collings*[1], R.W. Chantrell[1] and R.F. Evans[1] *1. University of York, York, United Kingdom*

WPA-15. **Nd–Fe–B films prepared by low temperature process.** *K. Higashi*[1], I. Fukuda[1], A. Yamashita[1], T. Yanai[1], H. Fukunaga[1], K. Nagai[2], T. Shinshi[2] and M. Nakano[1] *1. Nagasaki University, Nagasaki, Japan; 2. Tokyo Institute of Technology, Yokohama, Japan*

POSTER SESSION

Session WPB
HARD MAGNETIC MATERIALS VI (Poster Session)

George Hadjipanayis, Chair
University of Delaware, Newark, United States

WPB-01. **Nd–Fe–B Thick-film Magnets on Si Substrates with Al–O Underlayers.** *H. Yamaguchi*[1], K. Higuchi[1], H. Kaku[1], A. Yamashita[1], T. Yanai[1], H. Fukunaga[1], K. Nagai[2], T. Shinshi[2] and M. Nakano[1] *1. Nagasaki University, Nagasaki, Japan; 2. Tokyo Institute of Technology, Yokohama, Japan*

WPB-02. **Influence of Grain Size on the Grain Boundary Diffusion Process and Coercivity Enhancement of Sintered Nd-Fe-B Magnets.** *D. Shi*[2,1], C. Wang[3], D. Chen[2], Q. Lan[2,1] and M. Wu[2,1] *1. Institute of rare earth magnetic material, Xiamen Tungsten Co., Ltd, Xiamen, China; 2. Fujian Key Laboratory for Rare Earth Functional Materials, Longyan, China; 3. College of Materials Science and Engineering, Fuzhou University, Fuzhou, China*

WPB-03. **Achievement of high coercivity for Sm(Fe-Co)-B thin films by appropriate heat treatment after Al deposition.** *Y. Mori*[1], M. Kambayashi[1], M. Doi[1] and T. Shima[1] *1. Tohoku Gakuin University, Tagajo, Japan*

WPB-04. **Effect of Cu Addition on Magnetic Properties and Microstructures of $SmFe_{11}Ti$ Alloys Prepared by Melt-Spinning.** *H. Lee*[1] and J. Kim[1] *1. Hanyang University, Ansan, The Republic of Korea*

WPB-05. **Magnetic properties and microstructures of $Ce_xSm_{0.8-x}Zr_{0.2}(Fe_{0.8}Co_{0.2})_{11.5}Ti_{0.5}$ (x=0-0.8) alloys with $ThMn_{12}$ structure prepared by melt-spinning method.** F. Liu[1], *H. Feng*[1], X. Sun[1,2] and H. Zhao[1] *1. Central Iron & Steel Research Institute, Beijing, China; 2. Digital R&D Center of China Iron & Steel Research Institute Co., Ltd., Beijing, China*

WPB-06. **Assessment of Directionally Solidified Eutectic Sm–Fe(Co)–Ti Alloys as Permanent Magnet Materials.** A. Gabay[1], *C. Han*[2], C. Ni[2] and G. Hadjipanayis[1,3] *1. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 2. Department of Materials Science and Engineering, University of Delaware, Newark, DE, United States; 3. Department of Chemical Engineering, Northeastern University, Boston, MA, United States*

WPB-07. **Achievement of high saturation magnetization and coercivity on $ThMn_{12}$-type Sm-Zr-Fe-Co-Ti-Cu-B alloys.** *H. Makuta*[1] and T. Fujiwara[1] *1. Tokin Corporation, Sendai, Japan*

WPB-08. **Increase in coercivity of $Sm(Fe\text{-}Co)_{12}$-B thin films by diffusion from trench side.** *S. Hatanaka*[1], Y. Mori[1], M. Doi[1] and T. Shima[1] *1. Tohoku Gakuin University, Sendai-shi, Japan*

WPB-09. **Enhancement of Maximum Energy Product by α-Fe Coating on the Side of Rectangular $Sm(Fe_{0.8}Co_{0.2})_{12}$ Nanoparticles.** *R. Uda*[1], K. Koike[1], N. Inaba[1], H. Kato[1], M. Itakura[2], M. Nakano[3], S. Okubo[4] and H. Ohta[4] *1. Graduate school of science and engineering, Yamagata University, Yonezawa, Japan; 2. Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Kasuga, Japan; 3. Graduate School of Engineering, Nagasaki University, Nagasaki, Japan; 4. Molecular Photoscience Research Center, Kobe University, Kobe, Japan*

WPB-10. **Withdrawn**

WPB-11. **Improvement of magnetic property for melt spun $CeCo_5$ ribbons due to Fe and C-doping.** *H.W. Chang*[1], C. Chang[1], Y. Wong[1], W.C. Chang[1] and C. Shaw[2] *1. National Chung Cheng University, Chia-Yi, Taiwan; 2. Superrite Electronics Co. Ltd., Taipei, Taiwan*

WPB-12. **Enhanced magnetic properties of anisotropic $SmCo_5$/Fe-Co composites prepared using ultrasound-assisted electroless plating.** G. Lee[1], *J. Ahn*[1] and J. Kim[1] *1. Department of Materials Science and Chemical Engineering, Hanyang University, Ansan, The Republic of Korea*

WPB-13. **Effect of isothermal aging process on the microstructure of grain boundary regions in Sm(Co, Fe, Cu, Zr)$_z$ magnets.** *C. Dong*[1], L. Liu[1], B. Zhou[1], Y. Sun[1], Y. Ding[1] and A. Yan[1] *1. CISRI & NIMTE Joint Innovation Center for Rare Earth Permanent Magnets, Ningbo Institute of Materials Technology and Engineering, Ningbo, China*

POSTER SESSION

Session WPC
HARD MAGNETIC MATERIALS VII (Poster Session)

Yukiko Takahashi, Chair
NIMS, Tsukuba, Japan

WPC-01. **High Coercive Force $Sm_2Fe_{17}N_3$ Magnetic Materials by Phosphate Surface Modification.** *S. Tada*[1], S. Yamanaka[1], K. Iwai[1] and M. Abe[1] *1. Nichia Corporation, Anan-shi, Japan*

WPC-02. **Study of recycle process of $Sm_2Fe_{17}N_3$ bonded magnet.** *M. Yamamoto*[1], T. Sasaki[1], K. Kawamura[1] and T. Yamashita[1] *1. NIchia Corporation, Anan-shi, Japan*

WPC-03. **High saturation magnetization and high coercivity of Co substituted orthoferrite.** *A. Sawamoto*[1] and X. Liu[1] *1. Shinshu University, Nagano, Japan*

WPC-04. **Switching Field Distributions and Magnetocrystalline Anisotropy Fields in Zn-Ti and Co-Ti Equally Co-Substituted BaM Ferrites.** *A. Hoez*[1], A. Chevalier[1] and J. Mattei[1] *1. Université de Bretagne Occidentale, Brest, France*

WPC-05. **Generation probability of point defects considering microscopic elastic scattering cross-sections in rare-earth permanent magnets via first-principles calculations.** *F. Akagi*[1], R. Suzuki[1] and T. Yayama[1] *1. Kogakuin University, Tokyo, Japan*

WPC-06. **Reduction effect of coercivity of electroplated Fe-Pt film magnets by chloride ion in plating baths.** *D. Fukushima*[1], R. Narabayashi[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Graduate school of Engineering, Nagasaki University, Nagasaki, Japan*

WPC-07. **Synthesis of Hexaferrite-Based $SrFe_{12}O_{19}$/FeCo Nanocomposites.** *Y. Okawa*[1], S. Okada[1] and S. Yamamuro[1] *1. Graduate School of Science and Engineering, Ehime University, Matuyama, Japan*

WPC-08. **Effect of low-temperature annealing on hard magnetic properties of electroplated Fe-Pt films.** *R. Narabayashi*[1], D. Fukushima[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Graduate School of Engineering, Nagasaki University, Nagasaki, Japan*

WPC-09. **Effect of Cu addition on the crystal structure and magnetic properties for Mn-Ga thin films.** *Y. Miura*[1], M. Doi[1] and T. Shima[1] *1. Tohoku Gakuin University, Sendai, Japan*

WPC-10. **Demagnetization of Nd-Fe-B Sintered and Ferrite Magnets Derived from Magnetic Measurements.** *Y. Matsuura*[1] *1. Research Institute for Applied Sciences, Kyoto, Japan*

WPC-11. **Magnetic properties of Co-Zr-Si-B melt-spun ribbons.** *M. Tanaka*[1] and T. Saito[1] *1. Chiba Institute of Technology, Narashino, Japan*

WPC-12. **Formation of bct structure and high magnetic anisotropy in Fe-Co films with added V and C elements.** *T. Hasegawa*[1] and T. Nishikawa[1] *1. Department of Materials Science, Akita University, Akita, Japan*

WPC-13. **Microstructural and magnetic properties of low-energy ball milled LTP-MnBi powders via melt-spinning and gas-atomization.** *M. Kang*[1] and J. Kim[1] *1. Department of Materials Science and Chemical Engineering, Hanyang University, Ansan, The Republic of Korea*

WPC-14. **Effect of additive elements on crystal structure and magnetic properties for FeMnGa thin films.** *T. Yokoe*[1], M. Doi[1] and T. Shima[1] *1. Tohoku Gakuin University, Sendai-shi, Japan*

Session XOA
THIN FILMS AND SURFACE EFFECTS I

Sonka Reimers, Chair
Johannes Gutenberg University Mainz, Mainz, Germany

XOA-01. **Tailored Metamagnetic Behavior under Spatial Confinement.** ***(Invited)*** J.A. Arregi[1], L. Motyčková[2], O. Gomonay[3] and *V. Uhlir*[1,2] *1. CEITEC BUT, Brno University of Technology, Brno, Czechia; 2. Institute of Physical Engineering, Brno University of Technology, Brno, Czechia; 3. Johannes Gutenberg University, Mainz, Germany*

XOA-02. **Odd spin frustration in ultrathin Cr(001) films studied by spin-polarized scanning tunneling microscopy.** *T. Kawagoe*[1] and S. Suga[2] *1. Osaka Kyoiku University, Kashiwara, Japan; 2. Osaka University, Ibaraki, Japan*

XOA-03. **Direct observation of spin polarization in epitaxial Fe3O4(001)/MgO thin films grown by magnetron sputtering.** *Z. Zhang*[1], X. Lu[1], Y. Yan[1], J. Lu[1], Z. Li[1], Q. Liu[1], F. Zhu[2], J. Cao[2], Y. Wang[2], Z. Huang[4], Y. Zhai[4], Y. Li[1], X. Ruan[1], L. He[1], J. Wu[3], J. Du[1], R. Zhang[1] and Y. Xu[1,3] *1. Nanjing University, Nanjing, China; 2. Shanghai Synchrotron Radiation Facility, Shanghai, China; 3. York-Nanjing International Joint Center in Spintronics, York, United Kingdom; 4. Department of Physics, Southeast University, Nanjing, China*

XOA-04. **Influence of Free Layer Surface Roughness on Tunnel Magnetoresistance in 300 mm CMOS-compatible MTJ Stacks.** *C.A. Durner*[1,2], M. Lederer[1], T. Gurieva[1], J. Hertel[1], M. Hindenberg[1], L. Gerlich[1], M. Wagner-Reetz[1] and S. Parkin[2] *1. Center Nanoelectronic Technologies (CNT), Fraunhofer IPMS, Dresden, Germany; 2. Nanosystems from Ions, Spins and Electrons (NISE), Max Planck Institute of Microstructure Physics, Halle (Saale), Germany*

XOA-05. **Ferromagnetic Springs in Exchange Biased Trilayers.** *S. Akhundzada*[1], A. Vereijken[1], L. Paetzold[1], V. Vanakalapu[1], C. Janzen[1], T. Saerbeck[2] and A. Ehresmann[1] *1. Institute of Physics and Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kasel, Kassel, Germany; 2. Institut Laue-Langevin, Grenoble, France*

XOA-06. **Understanding magnetocrystalline anisotropy of distorted Fe/MgO(001) interface based on orbital and quadrupole moments.** *Y. Miura*[1] and J. Okabayashi[2] *1. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 2. Research Center for Spectrochemistry, The University of Tokyo, Tokyo, Japan*

XOA-07. **Role of Cu in Buffer-free $SmCo_{5-x}Cu_x$ Hard Magnetic Thin Films.** G. Gkouzia[1], D. Günzing[2], T. Weßels[3,2], A. Kovács[3], A. N/Diaye[4], M. Major[1], J. Palakkal[1], R. Xie[1], H. Zhang[1], H. Wende[2], K. Ollefs[2] and *L. Alff*[1] *1. Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; 2. Physics, Faculty of Physics and Center for Nanointegration (CENIDE), Duisburg, Germany; 3. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich, Jülich, Germany; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

XOA-08. **Investigating magnetocrystalline anisotropy in the system Au/Co-Staircase/Au(788) by using XMCD.** *R.J. Rosa*[1], R.L. Souza[1], G. Gomes[2,3], R. Paniago[3] and M. Martins[1] *1. Centro de Desenvolvimento da Tecnologia Nuclear - CDTN, Belo Horizonte, Brazil; 2. CCET - UNIMONTES, Montes Claros, Brazil; 3. Universidade Federal de Minas Gerais - UFMG, Belo Horizonte, Brazil*

XOA-09. **Controlling pi-anisotropy with organic multilayers.** *T. Moorsom*[1], S. Ozdemir[1], M. Rogers[1], M. McCauley[2], D. MacLaren[2] and O. Cespedes[1] *1. University of Leeds, Leeds, United Kingdom; 2. University of Glasgow, Leeds, United Kingdom*

XOA-10. **Spinterface formation of sexithiophene (6T) on ferromagnetic surfaces.** *M. Alotaibi*[3], P.D. Bentley[1,2], J. Bradley[3], T. Bird[3], O. Fossberg[3], G. Bertolini[3], S. Tear[3], I. Bergenti[4] and A. Pratt[3] *1. National Institute for Quantum Science and Technology, Takasaki, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. School of Physics, Engineering and Technology, University of York, York, United Kingdom; 4. Institute of Nanostructured Materials, CNR, Bologna, Bologna, Italy*

XOA-11. **Bending Strain Tailored Exchange Bias, Anisotropic Magnetoresistance and Planar Hall Resistance of Flexible Co/MnN Epitaxial Bilayers.** *Z. Chen*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

Session XOB
THIN FILMS, SURFACE EFFECTS AND MULTI-LAYERED FILMS I

Andy Thomas, Chair
TU Dresden, IFMP, Dresden, Germany

XOB-01. **Defect-driven antiferromagnetic domain walls in CuMnAs films. *(Invited)*** *S. Reimers*[1,2], D. Kriegner[3,4], O. Gomonay[1], D. Carbone[5], F. Krizek[4], V. Novak[4], R. Campion[2], F. Maccherozzi[6], A. Björling[5], O. Amin[2], L. Barton[2], S. Poole[2], K. Omari[2], J. Michalicka[7], O. Man[7], J. Sinova[1], T. Jungwirth[4,2], P. Wadley[2], S. Dhesi[6] and K. Edmonds[2]
1. Institut für Physik, Johannes-Gutenberg-Universität Mainz, Mainz, Germany; 2. School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom; 3. TU Dresden, Dresden, Germany; 4. Czech Academy of Sciences, Prague, Czechia; 5. MAX IV Laboratory, Lund, Sweden; 6. Diamond Light Source Ltd, Chilton, United Kingdom; 7. Central European Institute of Technology, Brno, Czechia

XOB-02. **Field-free superconducting diode effect in noncentrosymmetric superconductor/ferromagnet multilayers. *(Invited)*** *T. Ono*[1] *1. Kyoto University, Uji, Japan*

XOB-03. **Modulation of anomalous Nernst effects in Fe_4N and Mn_4N films on $SrTiO_3$ substrates.** *K. Ito*[1], H. Sharma[2], M. Mizuguchi[3] and K. Takanashi[1,4] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Imec, Leuven, Belgium; 3. Department of Materials Process Engineering, Nagoya University, Nagoya, Japan; 4. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

XOB-04. **Anomalous Magnetism in Epitaxial Mn_2Ru_xGa Thin Films.** *G. Atcheson*[1], J. O'Brien[1], A. Naden[2], K.E. Siewierska[1], J. Coey[1], K. Rode[1] and P.S. Stamenov[1] *1. CRANN/School of Physics, Trinity College Dublin, Dublin, Ireland; 2. School of Chemistry, University of St Andrews, St Andrews, United Kingdom*

XOB-05. **Magnetic layer thickness influence on the anisotropy of magnetoelastic properties in $Co_2Fe_{0.4}Mn_{0.6}Si$ Heusler alloys thin films.** *A. Nabialek*[1], O. Chumak[1], T. Yamamoto[2], T. Seki[2], K. Takanashi[2,3], L.T. Baczewski[1] and H. Szymczak[1] *1. Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

XOB-06. **Giant perpendicular magnetic anisotropy in Co-based ferromagnet/antiferromagnetic δ-Mn bilayers.** *R. Han*[1], X. Zhao[1], L. Liu[1], H. Sun[1], H. Qin[1], D. Pan[1] and J. Zhao[1] *1. State Key Laboratory of Superlattices and Microstructures, Institute of Semiconductor, Chinese Academy of Sciences, Beijing, China*

XOB-07. **Strain effects on magnetic compensation and spin reorientation transition of Co/Gd synthetic ferrimagnets.** *G. Masciocchi*[3,1], P. Li[2], T.J. Kools[2], A. Petrillo[2], B. Koopmans[2], R. Lavrijsen[2], A. Kehlberger[1] and M. Kläui[3] *1. Sensitec GmbH, Mainz, Germany; 2. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 3. Physics, Johannes Gutenberg University, Mainz, Germany*

XOB-08. **Structural and magnetic properties of CoFe/Sn-doped Ge/Co_2FeSi for vertical spin-valve devices on Si.** *S. Kusumoto*[1], M. Yamada[2,3], A. Yamada[1], Y. Wagatsuma[4], K. Sawano[4] and K. Hamaya[2,5] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. Center for Spintronics Research Network, Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 3. PRESTO, Japan Science and Technology Agency, Kawaguchi, Japan; 4. Advanced Research Laboratories, Tokyo City University, Setagaya, Japan; 5. Spintronics Research Network Division, Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan*

XOB-09. **Enhanced soft magnetic properties in N-doped amorphous FeCo thin film.** R. Das[1], G. Wei[1], D. Lordan[1], *R. Sai*[1], M. Hayes[1], B. Clarke[2], D. Hurley[2] and P. McCloskey[1] *1. MNS, Tyndall National Institute, Cork, Ireland; 2. TEL Magnetic Solutions Ltd (TELMS), Dublin, Ireland*

XOB-10. **Field angle-dependent bubble lattice formation in Re/Co/Pt multilayers.** S.K. Jena[1], J. Kisielewski[2], R. Gieniusz[2], U. Guzowska[2], A. Fakhredine[1], C. Autieri[1], A. Lynnyk[1], A. Pietruczik[1], A. Maziewski[2] and *A. Wawro*[1] *1. Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. Faculty of Physics, University of Bialystok, Bialystok, Poland*

ORAL SESSIONS

Session XOC
INTERACTING MAGNETIC NANOPARTICLES

Rhodri Mansell, Chair
Aalto University, Espoo, Finland

XOC-01. **Flexible thermoelectrics based on 3D interconnected magnetic nanowire networks.** ***(Invited)*** *T. da Câmara Santa Clara Gomes*[1], N. Machal[1], F. Abreu Araujo[1] and L. Piraux[1] *1. UCLouvain, Louvain-la-Neuve, Belgium*

XOC-02. **Magnetic study of Cobalt three dimensional nanonetworks: First Order Reversal Curves, hysteresis loops and first magnetization curves.** A. Ruiz-Clavijo[1], O. Caballero-Calero[1], D. Navas[2], C. Martín-Rubio[3], *R. Sanz González*[3] and M. Martín-González[1] *1. Instituto de Micro y Nanotecnología, Tres Cantos, Spain; 2. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain; 3. Payloads and Space Science Department, National Institute for Aerospace Technology, Torrejon de Ardoz, Spain*

XOC-03. **Withdrawn**

XOC-04. **Ultrasmall Fe_3O_4@Au Composite Nanoparticles with Different Sizes of Fe_3O_4 for Magnetic Hyperthermia.** *L. Tonthat*[1], T. Ogawa[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan*

XOC-05. **Electrodeposited CoPt multilayered-nanowire for 3D memory device.** *M. Hasan*[1], T. Huang[2], M. Saito[1], Y. Takamura[2], D. Oshima[3], T. Kato[3,4] and T. Homma[1,5] *1. Research Organization for Nano and Life Innovation, Waseda University, Shinjuku, Japan; 2. Dept. of Electrical and Electronic Eng., Tokyo Institute of Technology, Meguro, Japan; 3. Dept. of Electronics, Nagoya University, Chikusa, Japan; 4. Institute of Materials and Systems for Sustainability, Nagoya University, Chikusa, Japan; 5. Dept. of Applied Chemistry, Waseda University, Shinjuku, Japan*

XOC-06. **Tunable Magnon-Magnon Coupling Mediated by Static and Dynamic Dipolar Interaction in $Ni_{80}Fe_{20}$ Nanocross Array.** *P.K. Pal*[1] and A. Barman[1] *1. Condensed Matter Physics and Material Sciences, S N Bose National Centre For Basic Sciences, Kolkata, India*

XOC-07. **Magnetostatic Interactions in Fe/Au Barcode Nanowire Arrays.** *A. Samardak*[1], Y. Jeon[2], A. Kozlov[1], A. Ognev[1], E. Jeong[3], G. Kim[3], M. Ko[3], A.S. Samardak[1] and Y. Kim[3] *1. Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Center for Hydrogen Fuel Cell Research, Korea Institute of Science and Technology, Seoul, The Republic of Korea; 3. Department of Materials Science and Engineering, Korea University, Seoul, The Republic of Korea*

XOC-08. **Magnetization Dynamics of Interacting Iron Oxide Nanoparticles in Ionic Solutions.** *W. Muliawan*[1], Y. Chen[1] and Y. Kitamoto[1] *1. Materials Science and Engineering, Tokyo Institute of Technology, Yokohama, Japan*

XOC-09. **Dynamic properties of magnetic nanoparticles in highly ordered arrangements: size- & spacing-dependent properties.** *N. Neugebauer*[1], Y. Wang[2], M. Elm[1], D. Hofmann[1], X. Ye[2], C. Heiliger[1] and P. Klar[1] *1. Justus-Liebig University, Giessen, Germany; 2. Indiana University, Bloomington, IN, United States*

XOC-10. **Magnetic interaction in superparamagnetic Co-Pt nanoparticles synthesized in *Pyrococcus furiosus* virus-like particle (PfV) crystal.** *K. Tagata*[1], D. Kanda[1], N. Kobayashi[1], A. Higashiura[2], S. Ichikawa[3], N. Kishida[1], R. Nakatani[1,5], A. Nakagawa[4] and Y. Shiratsuchi[1,5]
1. Graduate School of Engineering, Osaka University, Suita, Japan; 2. Graduate School of Biomedical and Health Science, Hiroshima University, Hiroshima, Japan; 3. Research center for Ultra-High Voltage Electron Microscopy, Osaka University, Suita, Japan; 4. Institute for protein Research, Osaka University, Suita, Japan; 5. Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan

XOC-11. **On the metamagnetic phase transition in thick B2-like FeRh nanoclusters assemblies.** G. Herrera[1], *D. Le Roy*[1], A. Tamion[1], L. Bardotti[1], F. Tournus[1], S. Gonzales[2], M. Bugnet[3], P. Schoeffmann[4], E. Otero[4], P. Ohresser[4], F. Wilhelm[5], A. Rogalev[5], I. Canero-Infante[2] and V. Dupuis[1]
1. Institut Lumiere Matiere, Villeurbanne, France; 2. Institut des Nanotechnologies de Lyon, Villeurbanne, France; 3. MATEIS, Villeurbanne, France; 4. Synchrotron SOLEIL, Saint-Aubin, France; 5. European Synchrotron Radiation Facility, Grenoble, France

Session XOD
MAGNETIC NANOPARTICLES: THEORY, SYNTHESIS AND CHARACTERIZATION

Yen-Lin Huang, Chair
National Yang Ming Chiao Tung University, Hsinchu city, Taiwan

XOD-01. **Unveiling new insights into bi-magnetic antiferromagnetic/ferrimagnetic Core/Shell nanoparticles: a multicharacterization approach.** ***(Invited)*** *M. Estrader*[2], A. Gómez Roca[1,3], A. López-Ortega[4], R. Ichikawa[5], I. Peral[6], X. Turrillas[7], D. del-Pozo-Bueno[8], M. Varela[9], F. Peiró[8,3], S. Estradé[8,3] and J. Nogués[1,10] *1. Catalan Institute of Nanoscience and Nanotechnology ICN2, Bellaterra, Spain; 2. Departament de Química Inorgànica i Orgànica, Universitat de Barcelona, Barcelona, Spain; 3. Institute of Nanoscience and Nanotechnology of the University of Barcelona (IN2UB), Barcelona, Spain; 4. Departamento de Ciencias and Institute for Advanced Materials and Mathematics INAMAT, Universidad Pública de Navarra, Pamplona, Spain; 5. Nuclear and Energy Research Institute (IPEN/CNEN-SP), Sao Paulo, Brazil; 6. Department of Physics and Materials Science, University of Luxembourg, Luxembourg, Luxembourg; 7. Institut de Ciència de Materials de Barcelona-CSIC, CSIC, Bellaterra, Spain; 8. LENS-MIND, Departament Enginyeries Electrònica i Biomèdica, Universitat de Barcelona, Barcelona, Spain; 9. Departamento de Física de Materiales e Instituto Pluridisciplinar, Universidad Complutense de Madrid, Madrid, Spain; 10. ICREA, Barcelona, Spain*

XOD-02. **Nanostructure-Induced $L1_0$-Ordered CoPt Ferromagnetic Nanowires on Si/SiO_2 Substrates.** *R. Toyama*[1,6], S. Kawachi[2,3], J. Yamaura[3,4], T. Fujita[5], Y. Murakami[4], H. Hosono[3] and Y. Majima[1,3] *1. Laboratory for Materials and Structures, Tokyo Institute of Technology, Yokohama, Japan; 2. Graduate School of Science, University of Hyogo, Kamigori, Japan; 3. Materials Research Center for Element Strategy, Tokyo Institute of Technology, Yokohama, Japan; 4. Institute of Materials Structure Science, High Energy Accelerator Research Organization, Tsukuba, Japan; 5. School of Environmental Science and Engineering, Kochi University of Technology, Kami, Japan; 6. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan*

XOD-03. **Microfabrication of High Aspect Ratio Complex Components based on Soft Ferromagnetic FeCo(V) Alloy by combining Lithography and Electrodeposition.** *E.M. Palmero*[1], M.R. Osorio[1], A. Valera[1], M. Acebrón[1], A. Bollero[1] and D. Granados[1] *1. IMDEA Nanociencia, Madrid, Spain*

XOD-04. **Electronic Structure of SHI-irradiated MWCNT: X-ray Absorption Spectroscopy Study.** *S. Gautam*[5], P. Thakur[1], S. Augistine[2], K. Asokan[4] and K. Chae[3] *1. Diamond Light Source Ltd, Oxfordshire, United Kingdom; 2. Deva Matha College, Kuravilangad, India; 3. Advanced Analysis Center, Korea Institute of Science and Technology, Seoul, The Republic of Korea; 4. Materials Science Division, Inter-University Accelerator Center, New Delhi, India; 5. Dr. SSB University Institute of Chemical Engineering & Technology, Panjab University, Chandigarh, India*

XOD-05. **Magnetic static structure and dynamic excitations of $TbCu_2$ nanoparticles.** *E.M. Jefremovas*[2,1], M. de la Fuente Rodríguez[2], D. Alba Venero[3], C. Echevarría-Bonet[4], P. Bender[2], B. Fåk[5], J.Á. Blanco Rodríguez[4] and L. Fernández Barquín[2] *1. Institut for Physics, Johannes Gutenberg University, Mainz, Germany; 2. CITIMAC, Universidad de Cantabria, Santander, Spain; 3. RAL-ISIS, Didcot, United Kingdom; 4. Física Aplicada, Universidad de Oviedo, Oviedo, Spain; 5. Institut Laue Langevin, Grenoble, France*

XOD-06. **Permeability of clustered soft magnetic narrow strips controlled by a surface normal magnetic field.** *T. Nakai*[1] *1. Industrial Technology Institute, Miyagi Prefectural Government, Sendai, Japan*

XOD-07. **Optical and surface properties of layered MoS_2.** *A. Mishra*[1] and P. Das[1] *1. Physics, IIT Delhi, New Delhi, India*

XOD-08. **A Machine Learning Based Analysis Method of AC Magnetization Spectra for Estimating Cluster Distribution of Magnetic Nanoparticles.** *Y. Chen*[1], K. Slavakis[2] and Y. Kitamoto[1] *1. Department of Materials Science and Engineering, Tokyo Institute of Technology, Yokohama, Japan; 2. Department of Information and Communications Engineering, Tokyo Institute of Technology, Yokohama, Japan*

XOD-09. **Soft Magnetic Properties of Agglomerates of Fe Nanoparticles Fabricated by Cold Spray Technique.** *E. Watanabe*[1,2], Y. Kurumiya[3], T. Ogawa[3], H. Kura[1], H. Saito[2], Y. Ichikawa[2] and K. Ogawa[2] *1. DENSO CORPORATION, Kariya, Japan; 2. Fracture and Reliability Research Institute, Tohoku University, Sendai, Japan; 3. Department of Electronic Engineering, Tohoku University, Sendai, Japan*

XOD-10. **Understanding the Effects of Material and Shape Anisotropy in Three-Dimensional Nanopillars on Two-Dimensional Islands.** *C.H. Leow*[1] and V. Ng[1] *1. Information Storage Materials Laboratory, Electrical and Computer Engineering (ECE), National University of Singapore, Singapore*

XOD-11. **Evolution of magnetic interactions from non-magnetic amorphous NiCu@SiO_2 composite.** *D. Patra*[1] and V. Srinivas[1] *1. Department of Physics, Indian Institute of Technology, Chennai, India*

XOD-12. **Nonreciprocal Surface Acoustic Wave Propagation Enabled by Out-of-Plane Magnetization.** *L. Liao*[1], J. Puebla[2], J. Kim[2], Y. Hwang[1] and Y. Otani[1,2] *1. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 2. CEMS, RIKEN, Wako, Japan*

XOD-13. **Fabrication of Fe-Fe_3O_4 co-aggregated nanoparticles assembly and its AC magnetic property.** *S. Yanagita*[1,2], Y. Yamaguchi[1], N. Kosaka[1], Y. Sotome[1], C.E. McNamee[3], S. Yamamoto[2], S. Saito[1] and T. Ogawa[1] *1. Department Electronic Engineering, Tohoku University, Sendai, Japan; 2. Advanced Research Department, Sankei Giken Kogyo Co., Ltd., Isesaki, Japan; 3. Department of Chemistry and Materials, Shinshu University, Ueda, Japan*

XOD-14. **Tailoring the Magnetization Processes of Chemically Modulated Cylindrical Nanowires.** *L. Perez*[1,2], C. Fernandez Gonzalez[2,3], A. Berja[4], A. Mascaraque[1], L. Aballe[5], M. Foerster[5], R. Sanz González[6] and S. Ruiz Gómez[3] *1. Fisica de Materiales, Universidad Complutense de Madrid, Madrid, Spain; 2. IMDEA Nanociencia, Madrid, Spain; 3. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 4. Instituto de Cerámica y Vidrio - CSIC, Madrid, Spain; 5. Alba Synchrotron, Cerdanyola del Valles, Spain; 6. Instituto Nacional de Técnica Aeroespacial, Torrejon de Ardoz, Spain*

Session XPB
THIN FILMS, SURFACE EFFECTS AND MULTI-LAYERED FILMS II (Poster Session)

Luana Caron, Chair
Bielefeld University, Bielefeld, Germany

XPB-01. **Ion Irradiation Effects on Crystal Structure and Magnetic Properties of Iron-Nickel Binary Alloys.** *Y. Kamada*[1], T. Oyake[1], T. Murakami[1], S. Kobayashi[1], K. Shimizu[1] and H. Watanabe[2] *1. Faculty of Science and Engineering, Iwate University, Morioka, Japan; 2. Research Institute Applied Mechanics, Kyusyu University, Kasuga, Japan*

XPB-02. **Improving magnetic and dielectric performance of Co-$BaMgF_4$ nanocomposite films by thermal annealing treatment.** *N. Yokohama*[1], H. Kijima-Aoki[1,2] and H. Masumoto[1] *1. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 2. Department of Electrical Engineering, Tohoku University, Sendai, Japan*

XPB-03. **Interfacial Dzyaloshinskii-Moriya interaction in epitaxial Pd/Co/Ta films.** *A. Kozlov*[1], M.A. Kuznetsova[1], A.F. Shishelov[1] and A. Samardak[1] *1. Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation*

XPB-04. **Compositionally magnetostrictive response of perpendicularly magnetized Ta/CoFe(B)/MgO films.** *S. Ahn*[1] *1. POSTECH, Pohang, The Republic of Korea*

XPB-05. **Superconducting transition temperature and proximity coupling in Nb/Co multilayers.** *T. Kikuta*[1], S. Komori[1], K. Imura[1] and T. Taniyama[1] *1. Department of Physics, Nagoya University, Nagoya, Japan*

XPB-06. **Magnetic hardness of graded interface exchange spring $L1_0$-FePt films with Co nanoinclusions.** C. Paleo[1], F. Wilhelm[2], A. Dias[3], N. Dempsey[3], V. Dupuis[1] and *D. Le Roy*[1] *1. Institut Lumière Matière, Villeurbanne, France; 2. The European Synchrotron Radiation Facility (ESRF), Grenoble, France; 3. Institut Néel CNRS, Grenoble, France*

XPB-07. **Perpendicular magnetic anisotropy based spintronic devices in Pt/Co and Pt/Co/X/Pt stacks under different hard and flexible substrates.** *S. Eimer*[1], H. Cheng[1,2], P. Vallobra[1], Z. Boyu[2] and W. Zhao[1,2] *1. Hefei Innovation Research Institute, Beihang University, Hefei, China; 2. School of Integrated Circuit Science and Engineering, 2MIIT Key Laboratory of Spintronics, Beijing, China*

XPB-08. **Effects of Hydrogen Absorption on Magneto-Transport Properties of CoPd Multilayers.** *Y. Lai*[1], B. Huang[1], C. Chen[1], Y. Tang[1] and J. Hong[2] *1. Department of Physics, National Central University, Taoyuan City, Taiwan; 2. Department of Physics, Tamkang University, New Taipei City, Taiwan*

XPB-09. **Withdrawn**

XPB-10. **Antiferromagnetically exchange coupled CoFe/MgO/CoFe stacks.** *S. Ahn*[1] *1. POSTECH, Pohang, The Republic of Korea*

XPB-11. **Iron and gold thin films: first-principles study.** J.N. Rychly-Gruszecka[1], H. Glowinski[1], J. Snarski-Adamski[1], P. Kuswik[1] and *M. Werwinski*[1] *1. Institute of Molecular Physics, Polish Academy of Science, Poznan, Poland*

XPB-12. **Fe-Co films electroplated from glycine-based plating baths.** *R. Hosohata*[1], Y. Matsumoto[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Graduate School of Engineering, Nagasaki University, 1-14 Bunkyo, Japan*

POSTER SESSION

Session XPC
MAGNETIC NANOPARTICLES AND NANOWIRES (Poster Session)

Yuko Ichiyanagi, Chair
Yokohama National University, Yokohama, Japan

XPC-01. **Magnetic Properties and XAFS Analysis of PEG-coated Gd-doped ZnO Magnetic Nanoparticles.** *K. Nii*[1], K. Ohara[1], K. Nakazawa[1], T. Sakamoto[1], T. Moriwaki[1], Y. Fujita[1], H. Amano[1], I. Kawaguchi[1], S. Kobayashi[1], T. Shimohama[1] and Y. Ichiyanagi[1] *1. Yokohama National University, Yokohama, Japan*

XPC-02. **Design and optimization of magnetic fluid sealing with pole teeth on the shaft.** *Z. Li*[1] and D. Li[1] *1. State Key Laboratory of Tribology, Tsinghua University, Beijing, China*

XPC-03. **Structure and Magnetic Properties of Mn–Pt and Mn–Pt–B Melt-Spun Ribbons.** M. Mitsue[1], *I. Sasaki*[1], Y. Zhang[1], T. Tokunaga[1] and T. Ogawa[2] *1. Kyushu Institute of Technology, Kitakyushu, Japan; 2. Fukuoka Industrial Technology Center, Kitakyushu, Japan*

XPC-04. **Facile Synthesis of Carbon-Encapsulated Fe/Fe_3C Nanocomposite Particles and Their Magnetic Behavior.** *P. Chuang*[1], B. Chen[1], L. Huang[1], Z. Huang[1], Y. Chen[1], B. Xie[1], A. Spivakov[1] and C. Lin[1] *1. Department of Applied Physics, National Pingtung University, Pingtung, Taiwan*

XPC-05. **Magnetic nanopillars in self-organized magneto-dielectric nanocomposite thin films.** *H. Kijima-Aoki*[1,2], H. Masumoto[2] and Y. Endo[1,3] *1. Department of Electrical Engineering, Tohoku University, Sendai, Japan; 2. Frontier Research Institute for Interdisciplinary Sciences, Tohoku Universitty, Sendai, Japan; 3. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

XPC-06. **Evaluation of magnetization response of magnetic nanoparticles internalized into cultured adherent cells.** *M. Nishida*[1], M. Futagawa[1], Y. Takemura[2] and S. Ota[1] *1. Shizuoka University, Hamamatsu, Japan; 2. Yokohama National University, Yokohama, Japan*

XPC-07. **Electric Potential-Induced Localized Surface Plasmon Resonance of Fe_3O_4/Ag Composite Magnetic Nanoparticles.** *M. Riswan*[1], N. Adrianto[1], I.M. Yahya[1], N.I. Istiqomah[1], A.M. Panre[1], J. Juharni[1], S. Wahyuni[1], M. Arifin[1], I. Santoso[1], D. Oshima[2], T. Kato[2] and E. Suharyadi[1] *1. Universitas Gadjah Mada, Yogyakarta, Indonesia; 2. Nagoya University, Nagoya, Japan*

XPC-08. **Magnetoresistance of CoFe Nanocoils.** *K. Rogachev*[1], A. Samardak[1], A. Kozlov[1], V. Kharitonov[1], Z. Namsaraev[1], M. Bazrov[1], M. Stebliy[1], E. Jeong[2], Y. Jeon[2], A. Ognev[1], A.S. Samardak[1] and Y. Kim[3] *1. Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Center for Hydrogen Fuel Cell Research, Korea Institute of Science and Technology, Seoul, The Republic of Korea; 3. Department of Materials Science and Engineering, Korea University, Seoul, The Democratic People's Republic of Korea*

XPC-09. **Compositional dependence of structure, magnetic and electrical conduction properties of Co_xPt_{1-x} alloy nanowires fabricated by electrodeposition into nanoporous templates.** *N. Oguchi*[1], M. Syunpei[1], S. Kasai[2], S. Sugimoto[2], M. Saito[3], T. Homma[3], T. Ono[4], M. Shima[1] and K. Yamada[1] *1. Gifu University, Gifu, Japan; 2. National Institute for Materials Science, Tsukuba, Japan; 3. Waseda University, Tokyo, Japan; 4. Kyoto University, Kyoto, Japan*

XPC-10. **Dependence of magnetic properties of Ni nanowires on time of first anodization of Al_2O_3 template.** *M.I. Sobirov*[1], A. Samardak[1], K. Rogachev[1], A.S. Samardak[1] and A. Ognev[1] *1. Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation*

XPC-11. **Characterization and Magnetic Properties for Room Temperature Synthesis of Ni-doped Fe_3O_4/ZnS Core-Shell Nanoparticles.** *V. Arockia Doss*[1], D. Shiu[1], K. Lai[1], Y. Lin[2] and L. Horng[1] *1. PHYSICS, National Changhua University of Education, Changhua, Taiwan; 2. Chemistry, National Changhua University of Education, Changhua, Taiwan*

XPC-12. **Characterization of Néel relaxation time in multicore magnetic nanoparticles.** *H. Goto*[1], M. Futagawa[2], Y. Takemura[3] and S. Ota[2] *1. Electrical and Electronic Engineering Course, Graduate School of Integrated Science and Technology, Shizuoka University, Hamamatu, Japan; 2. Electrical and Electronic Engineering, Shizuoka University, Hamamatu, Japan; 3. Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

Session XPA
THIN FILMS AND SURFACE EFFECTS II (Poster Session)

Lucas Caretta, Chair
Brown University, Providence, RI, United States

XPA-01. **Suppression of the formation of soft magnetic phase in $Sm(Fe_{0.8}Co_{0.2})_{12}$-B thin films by introducing Sm seed layer.** *S. Nakatsuka*[1], Y. Mori[1], M. Doi[1] and T. Shima[1] *1. Tohoku Gakuin University, Sendai, Japan*

XPA-02. **Preparation of Mn-N-B Single-Crystal Thin Films with Perpendicular Magnetic Anisotropy.** *K. Imamura*[1], Y. Nakamura[1], S. Noro[1], S. Isogami[2] and M. Ohtake[1] *1. Yokohama National University, Yokohama, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan*

XPA-03. **Induced in-plane uniaxial magnetic anisotropy in Co thin films sputtered onto a single-crystal 128° Y-cut $LiNbO_3$ substrate.** *S. Shikano*[1], S. Ono[1], A. Yamaguchi[2], M. Shima[1] and K. Yamada[1] *1. Gifu University, Gifu, Japan; 2. University of Hyogo, Hyogo, Japan*

XPA-04. **Modulation of surface wettability and magnetization of $NiFe_2O_4$ films with thermal annealing.** *D. Wei*[1] *1. Department of Mechanical Engineering, Institute of Manufacturing Technology, Taipei, Taiwan*

XPA-05. **Silicide formation at lower temperatures for cobalt and nickel on $\sqrt{3}\times\sqrt{3}$-Ag/Si(111).** C. Chang[1], Y. Chow[1], P. Jiang[1], T. Fu[1] and *J. Tsay*[1] *1. National Taiwan Normal University, Taipei, Taiwan*

XPA-06. **Synthesis and in-situ XPS study of U-Te thin films.** *E. Tereshina-Chitrova*[1], M. Vališka[2], F. Huber[3] and T. Gouder[3] *1. Institute of Physics, Czech Academy of Sciences, Prague, Czechia; 2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 3. European Commission, Joint Research Centre (JRC), Karlsruhe, Germany*

XPA-07. **Growth and structural characterizations of off-stoichiometric IrMn thin films for tunneling magnetoresistive structure.** *S. Tungasmita*[2], K. Mopoung[1], F. Eriksson[1] and P. Persson[1] *1. Physics, Chemistry and Biology, Linköping University, Linköping, Sweden; 2. Physics, Chulalongkorn University, Bangkok, Thailand*

XPA-08. **Modeling the Dependence Hysteresis Characteristics of Thin Films Pd/Co/CoO on Cobalt Oxidation.** L. Afremov[1], *V. Kharitonov*[1], I. Iliushin[1,2] and P. Mushtuk[2,1] *1. Department of Theoretical Physics and Intelligent Technologies, Far Eastern Federal University, Vladivostok, Russian Federation; 2. Laboratory of Spin-Orbitronics, Institute of High Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation*

XPA-09. **Investigation of the Effect of the Oxidation Depth of Co/CoO Films on the Relative Constant of Interfacial Interaction.** *L. Brykin*[1] and L. Afremov[1] *1. Institute of High-Tech Technologies and Advanced Materials, Far Eastern Federal University, Vladivostok, Russian Federation*

XPA-10. **Orbital hybridization induced out-of-plane anisotropy in High entropy alloy thin-films.** *M. Talluri*[1], H. Perumal[2], B. Paikaray[1], A. Haldar[3], J. Sinha[2], P.P. Bhattacharjee[1] and C. Murapaka[1] *1. Materials science and metallurgical engineering, IIT Hyderabad, Hyderabad, India; 2. Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, India; 3. Department of Physics, IIT Hyderabad, Hyderabad, India*

XPA-11. **Fe-Ni films electroplated from gel electrolyte.** *Y. Matsumoto*[1], R. Hosohata[1], Y. Yamaguchi[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan*

XPA-12. **Magnetic structural analysis of Pt_3Fe antiferromagnet by single crystal neutron diffraction.** *A. Nakano*[1], S. Kobayashi[1], Y. Hotta[1], S. Goto[1], T. Sakakura[2] and H. Kimura[2] *1. Iwate University, Morioka, Japan; 2. Tohoku University, Sendai, Japan*

Session YOA
ADVANCES IN MAGNETIC CHARACTERIZATION I

Xiaoyan Zhong, Chair
City University of Hong Kong, Kowloon, Hong Kong

YOA-01. **Quantitative optical imaging method of surface acoustic wave using optical path modulation.** *R. Hisatomi*[1,2], K. Taga[1], R. Sasaki[3], Y. Shiota[1], T. Moriyama[1,2] and T. Ono[1] *1. Kyoto University, Uji, Japan; 2. JST-PRESTO, Kawaguchi, Japan; 3. RIKEN, Wako, Japan*

YOA-02. **Switching Dynamics of In-Plane Magnetized Spin-Orbit Torque Devices.** *P.S. Keatley*[1], T.H. Loughran[1], G. Mihajlović[2], L. Wan[2], Y. Choi[2], J. Katine[2] and R. Hicken[1] *1. Department of Physics and Astronomy, University of Exeter, Exeter, United Kingdom; 2. Western Digital Research Center, Western Digital Corporation, San Jose, CA, United States*

YOA-03. **Soft X-ray Orbital Angular Momentum carrying beam: Generation and application in magnetic materials.** ***(Invited)*** *S. Roy*[1], M. McCarter[1], J. Woods[2,3], J. T Lee[1], A. Us-Saleheen[1], A. Singh[4], R. Tumbleson[4,5], S. Morley[1], R.V. Chopdekar[1], A. Scholl[1], S. Kevan[1], X. Chen[6], W. Hu[6], C. Mazzoli[6], B. Farmer[2], A. Tremsin[7], S. Alexander[8], B. McMorran[8], W. Kwok[3], L. De-Long[2] and T. Hastings[9] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Dept. of Physics, University of Kentucky, Lexington, KY, United States; 3. Materials Sciences Division, Argonne National Laboratory, Lemont, IL, United States; 4. Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. Dept. of Physics, University of California Santa Cruz, Santa Cruz, CA, United States; 6. National Synchrotron Light Source II, Brookhaven National Laboratory, Upton, NY, United States; 7. Space Sciences Lab, University of California, Berkeley, Berkeley, CA, United States; 8. Dept. of Physics, University of Oregon, Eugene, OR, United States; 9. Department of Electrical and Computer Engineering, University of Kentucky, Lexington, KY, United States*

YOA-04. **Schuster-periodogram based reconstruction of non-locked dynamical processes in time-resolved scanning transmission X-ray microscopy.** *S. Finizio*[1], J. Bailey[1,2], B. Olsthoorn[3] and J. Raabe[1] *1. Photon Science Division, Paul Scherrer Institut, Villigen PSI, Switzerland; 2. EPFL, Lausanne, Switzerland; 3. KTH Royal Institute of Technology, Stockholm, Sweden*

YOA-05. **New versatile instruments to measure element-specific and macroscopic hysteresis at ID12 of the ESRF.** *A. Aubert*[1], G. Gomez[3,2], K. Skokov[1], F. Wilhelm[2], H. Wende[3], A. Rogalev[2], O. Gutfleisch[1] and K. Ollefs[3] *1. TU Darmstadt, Darmstadt, Germany; 2. European Synchrotron Radiation Facility, Grenoble, France; 3. University of Duisburg-Essen, Duisburg, Germany*

YOA-06. **Room-temperature magnetic antiskyrmions and anisotropic fractal magnetic domain textures in $(Fe,Ni,Pd)_3P$ with S_4 symmetry.** ***(Invited)*** *K. Karube*[1], L. Peng[1], J. Masell[1,2], V. Ukleev[3], J.S. White[3], M. Hemmida[4], H. Krug von Nidda[4], I. Kézsmárki[4], X. Yu[1], F. Kagawa[1,5], Y. Tokura[1,6] and Y. Taguchi[1] *1. RIKEN Center for Emergent Matter Science (CEMS), Wako, Japan; 2. Institute of Theoretical Solid State Physics, Karlsruhe Institute of Technology, Karlsruhe, Germany; 3. Laboratory for Neutron Scattering and Imaging, Paul Scherrer Institute, Villigen, Switzerland; 4. Experimental Physics V, University of Augsburg, Augsburg, Germany; 5. Department of Physics, Tokyo Institute of Technology, Meguro-ku, Japan; 6. Department of Applied Physics, University of Tokyo, Bunkyo-ku, Japan*

YOA-07. **Withdrawn**

YOA-08. **A sensitive magneto-optic Kerr effect and optical Hall effect technique based on large-amplitude magnetic field modulation.** *N. Am-Shalom*[1], M. Korcia[1], N. Bernstein[1] and A. Capua[1] *1. Applied Physics, The Hebrew University of Jerusalem, Jerusalem, Israel*

YOA-09. **Scanning MOKE microscope for inspection of MRAM manufacturing.** *M. Numata*[1], I. Kim[2], K. Suzuki[1], S. Ueyama[1], J. Kim[2], W. Kim[2] and M. Lee[2] *1. Samsung Device Solutions R&D Japan, Samsung Japan Corporation, Yokohama, Japan; 2. Mechatronics Research, Samsung Electronics Co., Ltd., Hwaseong, The Republic of Korea*

YOA-10. **Analysis of Magnetization Reversal Process of Non-Oriented Electromagnetic Steel Sheet by Extended Landau Free Energy Model.** *M. Taniwaki*[1], A.L. Foggiatto[1], C. Mitsumata[1], T. Yamazaki[1], I. Obayashi[2], Y. Hiraoka[3], Y. Igarashi[4], Y. Mizutori[4], H. Sepehri-Amin[5], T. Ohkubo[5] and M. Kotsugi[1] *1. Materials Science, Tokyo University of Science, Tokyo, Japan; 2. Okayama University, Okayama, Japan; 3. Kyoto University, Kyoto, Japan; 4. University of Tsukuba, Tsukuba, Japan; 5. National Institute for Materials Science (NIMS), Tsukuba, Japan*

YOA-11. **Magnetic Domain Observation of Grain-oriented Electrical Steel Sheet under Two-dimensional Excitation.** *D. Wakabayashi*[1], T. Uchiyama[1], M. Oka[1] and M. Enokizono[1,2] *1. Nippon Bunri University, Oita, Japan; 2. Vector Magnetic Characteristic Technical Laboratory, Usa, Japan*

Session YOB
ADVANCES IN MAGNETIC CHARACTERIZATION II

Sujoy Roy, Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States

YOB-01. **The Ferris-wheel ferromagnetic resonance technique.** *A. Rothschild*[1], N. Am-Shalom[1], N. Bernstein[1], B.J. Assouline[1] and A. Capua[1] *1. Applied Physics, The Hebrew University of Jerusalem, Jerusalem, Israel*

YOB-02. **Optical Profiling of Surface-Acoustic-Wave Absorption due to Elastically Driven Ferromagnetic Resonance in Nickel.** *K. Maezawa*[1], S. Fujii[1], K. Yamanoi[1], Y. Nozaki[1] and S. Watanabe[1] *1. Physics, Keio University, Yokohama, Japan*

YOB-03. **Atomic Scale Visualization of Magnetic Coupling at Individual Defects in Functional Materials by Spatially Resolved Electron Magnetic Circular Dichroism.** ***(Invited)*** *X. Zhong*[1,2] and Z. Li[1,2] *1. Materials Science and Engineering, City University of Hong Kong, Hong Kong; 2. City University of Hong Kong Matter Science Research Institute (Futian, Shenzhen), Shenzhen, China*

YOB-04. **Magnetic imaging by the anomalous Nernst effect using atomic force microscopy.** *N.D. Budai*[1]*, H. Isshiki[1], R. Uesugi[1], Z. Zhu[1], T. Higo[1,2], S. Nakatsuji[1,2] and Y. Otani[1,3] *1. Institute for Solid State Physics, The University of Tokyo, Kashiwa, Japan; 2. The Department of Physics, The University of Tokyo, Bunkyo-ku, Japan; 3. Center for Emergent Matter Science, RIKEN, Wako, Japan*

YOB-05. **Magnetic Imaging of Spin Textures in a Chiral Magnet.** *E. Marchiori*[1], G. Romagnoli[1], A. Magrez[2] and M. Poggio[1] *1. Department of Physics, University of Basel, Basel, Switzerland; 2. École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*

YOB-06. **In-situ correlation of electrical (magneto-)transport effects with magnetic textures in a transmission electron microscope.** ***(Invited)*** D. Pohl[5], B. Rellinghaus[5], S. Schneider[5], Y. Lee[1], D. Kriegner[2,3], S. Beckert[2], P. Vir[4], C. Felser[4], M. Winter[5] and *A. Thomas*[2,1] *1. IFW Dresden, Dresden, Germany; 2. IFMP, TU Dresden, Dresden, Germany; 3. FZU, Prague, Germany; 4. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 5. DCN, TU Dresden, Dresden, Germany*

YOB-07. **Spin canting at the surface of Fe_3O_4(001) imaged using a spin-polarized metastable helium beam.** P.D. Bentley[2,1], R.F. Evans[2], X. Sun[4], M. Kurahashi[3], *A. Pratt*[2] and Y. Yamauchi[3] *1. Quantum Materials and Applications Research Center, National Institutes for Quantum Science and Technology, Takasaki, Japan; 2. School of Physics, Engineering and Technology, University of York, York, United Kingdom; 3. National Institute for Materials Science (NIMS), Tsukuba, Japan; 4. University of Science and Technology of China, Anhui, China*

YOB-08. **Simulations of magnetic Bragg scattering in transmission electron microscopy.** *J. Snarski-Adamski*[1], A. Edström[2], P. Zeiger[3], J.Á. Castellanos-Reyes[3], K. Lyon[3], M. Werwinski[1] and J. Rusz[3] *1. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland; 2. Department of Applied Physics, School of Engineering Sciences, KTH Royal Institute of Technology, AlbaNova University Center, Stockholm, Sweden; 3. Division of Materials Theory, Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden*

YOB-09. **Topological Spin Memory of Antiferromagnetically Coupled Skyrmions.** ***(Invited)*** *X. Cheng*[1] *1. Physics, Bryn Mawr College, Bryn Mawr, PA, United States*

POSTER SESSION

Session YPA
ADVANCES IN MAGNETIC CHARACTERIZATION III (Poster Session)

Hendrik Ohldag, Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States

YPA-01. **Ac Susceptibility Measurement Using a Vibrating Sample Magnetometer.** *M. Al-Mahdawi*[1] and M. Oogane[1] *1. Tohoku University, Sendai, Japan*

YPA-02. **High-Frequency Magnetic Field Energy Imaging of Magnetic Recording Head by Alternating Magnetic Force Microscopy with Superparamagnetic Tip.** *M. Makarova*[1,2], K. Suzuki[1], H. Sonobe[1], T. Matsumura[1] and H. Saito[1] *1. Akita University, Akita, Japan; 2. Institute of Physics CAS, Prague, Czechia*

YPA-03. **Imaging of Magnetic Nanoparticle Using Magnetic Particle Spectroscopy Data.** *N. Futagawa*[1], M. Fujimoto[1], K. Higashino[1], T. Sasayama[1] and T. Yoshida[1] *1. Kyushu University, Fukuoka, Japan*

YPA-04. **Visualization of the Magnetostriction Mechanism Using Machine Learning.** *A.L. Foggiatto*[1], Y. Mizutori[2], T. Yamazaki[1], S. Sato[1], K. Masuzawa[1], R. Nagaoka[1], M. Taniwaki[1], S. Fujieda[3], S. Suzuki[4], K. Ishiyama[5], T. Fukuda[6], Y. Igarashi[2], C. Mitsumata[1] and M. Kotsugi[1] *1. Faculty of Advanced Engineering, Tokyo University of Science, Katsushika, Japan; 2. Graduate School of System and Information Engineering, University of Tsukuba, Tsukuba, Japan; 3. Graduate school of engineering, Osaka University, Suita, Japan; 4. Micro System Integration Center, Tohoku University, Sendai, Japan; 5. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 6. Fukuda Crystal Laboratory Co., Ltd., Sendai, Japan*

YPA-05. **Investigation to Improve Stability in Magnetic Nanoparticle Tomography Using Direct Magnetic Field Compensation Circuit.** *M. Fujimoto*[1], N. Futagawa[1], K. Higashino[1], T. Sasayama[2] and T. Yoshida[2] *1. Electrical and Electronic Engineering, Kyushu University, Fukuoka-shi, Japan; 2. Faculty of information and electrical engineering, Kyushu University, Fukuoka-shi, Japan*

YPA-06. **Polarized neutron transmission spectroscopy on an ultrafine grained steel.** *H. Mamiya*[1], O. Yojiro[2], N. Terada[1], K. hiroi[2] and t. shinohara[2] *1. National Institute for Materials Science, Tsukuba, Japan; 2. Japan Atomic Energy Agency, Tokai, Japan*

YPA-07. **Development of Pancake-type Gradiometer Receive Coil for Amplitude Modulated Open-sided Magnetic Particle Imaging.** *M. Tahir*[1], T. Le[2], T. Cao[1] and J. Yoon[1] *1. School of Integrated Technology, Gwangju Institute of Science and Technology, Gwangju, The Republic of Korea; 2. Department of Physiology and Biomedical Engineering, Mayo Clinic, Scottsdale, AZ, United States*

YPA-08. **In-situ Magnetizing Holder with Strong In-plane Field for Lorentz Microscopy.** *W. Xia*[1], J. Qin[1], T. Bai[1], X. Sun[1], R. Chen[1], A. Yan[1] and W. Li[1] *1. Ningbo Institute of Materials Technology and Engineering, CAS, Ningbo, China*

ORAL SESSIONS

Session ZOA
EMERGING AND INTERDISCIPLINARY TOPICS IN MAGNETISM I

Mengmeng Yang, Chair
Anhui University

ZOA-01. **Spin revolution breaks time reversal symmetry of rolling magnets.** *E.Y. Vedmedenko*[1] *1. Physics, University of Hamburg, Hamburg, Germany*

ZOA-02. **Thermal noise magnetometry as an emerging magnetic characterization technique.** K. Everaert[1,2], B. Van Waeyenberge[1], F. Wiekhorst[2] and *J. Leliaert*[1] *1. Dept. of Solid State Sciences, Ghent University, Gent, Belgium; 2. Metrology for Magnetic Nanoparticles, Physikalisch-Technische Bundesanstalt, Berlin, Germany*

ZOA-03. **Low-frequency magnetic incremental permeability for the evaluation of thick carburization levels.** *Y. Tene Deffo*[1], G. Sebald[2], C. Gallais[3], O. Ghibaudo[3] and B. Ducharne[2,4] *1. Faculty of Engineering and Technology, University of Buea, Buea, Cameroun, Buea, Cameroon; 2. ELyTMaX, CNRS, Univ Lyon, INSA Lyon, Centrale Lyon, Université Claude Bernard Lyon 1, Tohoku University, Japan, Sendai, Japan; 3. Audit et R&T Industriels, SAFRAN TRANSMISSION SYSTEMS, Colombes, France, Colombes, France; 4. Univ. Lyon, INSA Lyon, LGEF EA682, Villeurbanne, France, Lyon, France*

ZOA-04. **Applications of thermoplasmonics to nanomagnetic logic.** ***(Invited)*** *P. Vavassori*[1,2], M. Menniti[1], P. Gypens[3] and J. Leliaert[3] *1. CIC nanoGUNE BRTA, San Sebastian, Spain; 2. Ikerbasque, Bilbao, Spain; 3. Dept. of Solid State Sciences, Ghent University, Ghent, Belgium*

ZOA-05. **Polarization caloritronics and "ferron" excitations in ferroelectric materials.** *P. Tang*[1], R. Iguchi[2], K. Uchida[2] and G. Bauer[1,3] *1. Tohoku University, Sendai, Japan; 2. National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. University of Groningen, Groningen, Netherlands*

ZOA-06. **Prediction of Magnetocrystalline Anisotropy Constant in FeCoNi Alloys using Machine Learning.** *R. Sudo*[1] and M. Oogane[1,2] *1. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics (Core Research Cluster), Organization for Advanced Studies, Tohoku University, Sendai, Japan*

ZOA-07. **Tetraazanaphthotetraphene based two-dimensional transition metal organic frameworks: Spin-gapless semiconductor, quantum anomalous Hall effect and electrocatalysts for CO_2 reduction.** *Y. Wang*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

ZOA-08. **Influence of Magnetic Field on Evaporation of Water and Ionic Solutions.** *J. Coey*[1], L. Coburn-Moran[1] and J. Quirke[1] *1. Physics, Trinity College Dublin, Dublin, Ireland*

ZOA-09. **Magnetic-field-assisted photocatalysis of N-TiO_2 nanoparticles.** L. Cervera-Gabalda[1], E. Garaio[1], J. Beato-Lopez[1], J. Pérez-Landazábal[1] and *C. Gomez-Polo*[1] *1. Science Dept & INAMAT2, Universidad Publica de Navarra, Pamplona, Spain*

ZOA-10. **Design and Performance of a Compact 3D-Printed Magnetorheological Fluid Damper.** *J. Park*[1], Y. Choi[1], A. Flatau[1] and N. Wereley[1] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States*

ZOA-11. **An Electroplated Magnetic NiFe Film Based Electromagnetic Targeting for Interlocking-Nail Broken-Bone Surgery.** *M. Kohli*[1], T. Chai[1], I. Chen[1], T. Wong[2], W. Hsu[1] and T. Chung[1,3] *1. Department of Mechanical Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 2. Department of Orthopedics, National Taiwan University Hospital Hsinchu Branch, Hsinchu, Taiwan; 3. International College of Semiconductor Technology, National Yang Ming Chiao Tung University, Hsinchu, Taiwan*

ZOA-12. **Holding Performance of an Adaptive Magnetorheological Fluid-Based Robotic Claw.** Y. Choi[1], C. Hartzell[1] and *N. Wereley*[1] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States*

ZOA-13. **A wearable magnetic skin system for touchless human-computer interactions.** *J. Zhang*[1,2], Z. Jin[1], G. Chen[1] and J. Chen[1,2] *1. Chinese Academy of Sciences, State Key Laboratory of Transducer Technology, Aerospace Information Research Institute, Beijing, China; 2. University of Chinese Academy of Sciences, School of Electronic, Electrical and Communication Engineering, Beijing, China*

ZOA-14. **Magnetic Bionic Hair Array for Sliding Tactile Sensing and Object Recognition.** *J. Man*[1,2], Z. Jin[1] and J. Chen[1,2] *1. State Key Laboratory of Transducer Technology, Aerospace Information Research Institute, Chinese Academy of Sciences, Beijing, China; 2. School of Electronic, Electrical and Communication Engineering, University of Chinese Academy of Sciences, Beijing, China*

POSTER SESSION

Session ZPA
EMERGING AND INTERDISCIPLINARY TOPICS IN MAGNETISM II (Poster Session)

Elena Vedmedenko, Chair
University of Hamburg, Hamburg, Germany

ZPA-01. **Control of non-reciprocal critical current by ferromagnetism.** *H. Narita*[1], J. Ishizuka[2], D. Kan[1,3], Y. Shimakawa[1,3], Y. Yanase[4] and T. Ono[1,3] *1. Institute for Chemical Research, Kyoto University, Uji, Japan; 2. Niigata University, Niigata, Japan; 3. CSRN, ICR, Kyoto University, Uji, Japan; 4. Physics, Kyoto University, Kyoto, Japan*

ZPA-02. **Spin-current Driven Magnetic Meta-atoms for Time-varying Permeability.** R. Shimizu[1], T. Kodama[2], N. Kikuchi[3], S. Okamoto[3,4], S. Ohno[1] and *S. Tomita*[1,2] *1. Department of Physics, Tohoku University, Sendai, Japan; 2. Institute for Excellence in Higher Education, Tohoku University, Sendai, Japan; 3. Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; 4. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan*

ZPA-03. **A New Observation System for Nonlinear Localized Oscillation Using Commercially Available Magnet.** *Y. Mogi*[1] and M. Kato[1] *1. Electrical and Electronics Systems, Ibaraki University, Ibaraki, Japan*

ZPA-04. **Effect of Instability of Ferrofluid for enhanced EMI shielding in Ku-Band.** Y. Li[1], H. Kuan[1] and *H. Hsieh*[1] *1. Mechanical and Aerospace, Chung-Cheng Institute of Technology, National Defense University, Taoyuan, Taiwan*

ZPA-05. **Electride and Magnetic Properties of Ternary Intermetallic Compounds LaTMSi.** *A. Dyachenko*[1], A. Lukoyanov[1,2] and V. Anisimov[1,2] *1. M.N. Mikheev Institute of Metal Physics Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russian Federation; 2. Ural Federal University named after B.N. Yeltsin, Ekaterinburg, Russian Federation*

ZPA-06. **Emergent Magneto-Inductance Effect in $Ni_{45}Fe_{55}$ Thin Films on Polycarbonate Substrates.** *Z. Zhang*[1], Y. Matsushima[1], Y. Ohashi[1], M. Matsuzaka[1] and H. Kaiju[1,2] *1. Faculty of Science and Technology, Keio University, Yokohama, Japan; 2. Center for Spintronics Research Network, Keio University, Yokohama, Japan*

ZPA-07. **Enhancement of non-destructive evaluation by combining induction thermography and eddy current testing techniques.** *W. Cheng*[1,2] *1. NDE Center, Japan Power Engineering and Inspection Corporation, Yokohama, Japan; 2. Department of Quantum Science and Energy Engineering, Tohoku University, Sendai, Japan*

ZPA-08. **Fabrication of Thermoelectric Ribbon-Shaped Fe_3Al Alloys with Large Anomalous Nernst Effect.** *H. Takigawa*[1], T. Taguchi[1], T. Takahashi[1], A. Sakai[2] and S. Nakatsuji[2] *1. Inorganic Materials Development Dept, Murata Manufacturing Co., Ltd., Nagaokakyo-shi, Japan; 2. Department of Physics, University of Tokyo, Bunkyo-ku, Japan*

ZPA-09. **Magnetic MXene: A Machine Learning Model with Small Data.** *Y. Khatri*[1], V. Atpadkar[1], A. Agarwal[1] and A. Kashyap[1] *1. Indian Institute of Technology, Mandi, Mandi, India*

ZPA-10. **Magnetite/copolymer Nanosphere Added Soft-magnetic Carbonyl Iron Based Magnetorheological Fluid And Its Damping Performance.** *W. Han*[1], G. Wang[1] and F. Yang[1] *1. Energy and Power Engineering, Nanjing University of Science and Technology, Nanjing, China*

ZPA-11. **Monitoring Ionic Diffusion from CoB in Molecular layers.** *D.L. Roe*[1], A. Caruana[2], S. Langridge[2], C. Kinane[2] and O. Cespedes[1] *1. Physics and Astronomy, University of Leeds, Rotherham, United Kingdom; 2. ISIS, Rutherford Appleton Laboratory, Didcot, United Kingdom*

ZPA-12. **Application of Oleic acid functionalized Fe_3O_4 magnetic nanoparticles for adsorption of oil from emulsified solutions.** G.C. Hermosa[1], L. Fang[2], C. Liao[1], C. Chang[3], C. Chang[3,5], S. Wang[4] and *A.A. Sun*[1,5] *1. Department of Chemical Engineering & Materials Science, Yuan Ze University, Taoyuan, Taiwan; 2. Department of Mechanical and Industrial Engineering, Vanung University, Taoyuan, Taiwan; 3. Division of General Surgery, Far Eastern Memorial Hospital, New Taipei City, Taiwan; 4. Department of Materials and Mineral Resources Engineering, National Taipei University of Technology, Taipei, Taiwan; 5. Graduate School of Biotechnology and Bioengineering, Yuan Ze University, Taoyuan, Taiwan*

ZPA-13. **Transmission spectra of magnetic fluids with magnetite nanoparticles in the visible and near-IR regions.** *C.V. Yerin*[1] and V.I. Vivchar[1] *1. Physical and Technical Faculty, North Caucasus Federal University, Stavropol, Russian Federation*

ZPA-14. **Optically powered milli-scale robot system for nanoliter fluid delivery based on diamagnetic levitation.** M. Beauchamp[1], S. Yee[1], I. O'Carroll[1], E. Chapman[1] and *H. Elbidweihy*[1] *1. United States Naval Academy, Annapolis, MD, United States*

ZPA-15. **The annealing effect on the superconducting and magnetic properties of $FeTe_{0.8}S_{0.2}$ single crystals grown by the self-flux method.** *S.K. Miglani*[1], H. Chauhan[1] and G.D. Varma[1] *1. Physics, Indian Institute of Technology Roorkee, Roorkee, India*

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