MMM 2022 Conference

Minneapolis, MN • October 31 - November 4, 2022 • www.magnetism.org

PROGRAM

On-Demand Content

MMM 2022
MINNEAPOLIS, MN

Jointly sponsored by AIP Publishing LLC and the IEEE Magnetics Society

IEEE MAGNETICS

AIP Publishing

SCOPE OF THE CONFERENCE

WELCOME TO MINNEAPOLIS!

The 67th Annual Conference on Magnetism and Magnetic materials (MMM 2022) is sponsored jointly by AIP Publishing and the IEEE Magnetics Society. Members of the international scientific and engineering communities interested in recent developments in fundamental and applied magnetism are invited to attend and contribute to the technical sessions. The technical program will include invited and contributed papers in oral and poster sessions, invited symposia, a tutorial, and several special sessions. This Conference provides an outstanding opportunity for worldwide participants to meet their colleagues and collaborators and discuss developments in all areas of magnetism research.

MMM 2022 will offer both in-person and prerecorded on-demand content.

All presentations will be prerecorded and available online for on-demand viewing starting November 7, 2022 through January 7, 2023. Q&A for the prerecorded content will be conducted via the online chat boards.

During the Conference week, October 31 through November 4, there will be live programming for the virtual "Meet the Experts" session on Tuesday, November 1 (pre-registration required) and also for the virtual "How to Create an Effective Scientific Video Presentation" session on Wednesday, November 2 (open to all registered attendees).

Onsite registrants will attend in-person talks, Q&A, and networking events live in Minneapolis. Select talks presented onsite, including the Symposia, the Tutorial and both Evening Sessions, will be recorded and made available to registrants on the virtual platform starting November 7.

OFFICIAL HOTEL & CONFERENCE LOCATION

Hyatt Regency Minneapolis
1300 Nicollet Mall
Minneapolis, MN
(612) 370-1234

TIME ZONE

Minneapolis is located in the US Central Time Zone.

REGISTRATION

The Conference Registration Desk will be located on the main floor of the Hyatt Regency outside the Nicollet Ballroom.

Registration hours:

Monday	12:30 pm - 6:00 pm
Tuesday	7:30 am - 6:30 pm
Wednesday	7:30 am - 6:30 pm
Thursday	7:30 am - 4:30 pm

COVID INFORMATION

- For the most current information on U.S. COVID-19 entry requirements, please visit the U.S. Department of State website: https://travel.state.gov/content/travel.html

- Click here for the most current updates on Minneapolis COVID and Community Information.

- The following pharmacies/clinics are within a short cab ride or walking distance from the Conference hotel and offer COVID testing. Please note that their testing capabilities and hours are subject to change, so it is highly recommended that you call or go online to make an appointment ahead of time.

    - CVS Minute Clinic
        - 1110 Hennepin Avenue
        - (612) 338-5867
        - (0.6 miles from the Hyatt)

    - Park Nicollet Clinic Minneapolis
        - 2001 Blaisdell Ave
        - (952) 993-8000
        - (0.7 miles from the Hyatt)

    - CVS Minute Clinic
        - 1010 Lake Street
        - (612) 822-1297
        - (2.3 miles from the Hyatt)

CONFERENCE PROGRAM & ABSTRACT BOOKS

The Conference program book and abstract book are available for download HERE.

ITINERARY PLANNER

Use the Online Planner to plan your days onsite. This is the best way to know what is happening and where each day onsite.

MOBILE APP

The MyItinerary by ScholarOne mobile app provides onsite attendees with instant access to the entire onsite Conference program including abstracts, speakers, and the schedule of events. You can also use it to build your own customized schedule and to get in touch with other attendees. Download the app before you arrive!

Download on the App Store

GET IT ON Google Play

For all other devices Web Version

SOCIAL MEDIA

New this year! We are crowdsourcing our Conference photos, so all onsite attendees are encouraged to share their best photos from the Conference using **#MMM_2022**. Please do not include any presentation content in the background of your photos.

@MMMConf

NEED TO GET ONLINE?

Network: Hyatt Meeting Space
Wi-Fi Password: MMM2022_Minneapolis

GROUND TRANSPORTATION FROM THE AIRPORT

Information on airport transfers and the best ways to get around the city can be found here: https://www.minneapolis.org/map-transportation/minneapolis-saint-paul-airport/

CITY INFORMATION

Check out all there is to do in Minneapolis: https://www.minneapolis.org/

DAILY EVENTS

Morning Coffee

Tuesday - Friday
8:00 am – 11:30 am
Exhibit Hall (On Friday, coffee will move to Nicollet Promenade)

Bierstube

Tuesday, Wednesday, and Thursday
4:30 pm – 6:00 pm
Exhibit Hall
Join us each evening for a taste of the best local beers in town!

Tuesday Bierstube supported by:

Wednesday Bierstube supported by:

Oral Sessions and Symposia

Tuesday	**8:30 am – 11:30 am and 1:30 pm – 4:30 pm**
Wednesday	**8:30 am – 11:30 am and 1:30 pm – 4:30 pm**
Thursday	**8:30 am – 11:30 am and 1:30 pm – 4:30 pm**
Friday	**8:30 am – 11:30 am**

We will have eight simultaneous oral session rooms daily. All Symposia talks will be presented in Nicollet Ballroom ABC and will be recorded and posted on the virtual platform the week after the Conference. Use the Online Planner to see exactly which presentations are happening live onsite.

Symposium SB supported by:

Symposium SC supported by:

Symposium SD supported by:

Best Student Presentation Awards

Supported by:

This award recognizes and encourages excellence in graduate studies in the field of magnetism. There will be a $1,000 one-year fellowship for the winner and $250 one-year fellowship for the remaining finalists. **Conference attendees are encouraged to attend the talks and support these young scientists.**

The winner will be announced at the start of the Evening Session on Wednesday.

CONGRATULATIONS TO THE MMNM 2022 FINALISTS!

Riccardo Battistelli, *Helmholtz-Zentrum Berlin*
AC-01 (ROB-09)
Revealing 3D Magnetic Textures in [Pt/Co/Cu]15 Multilayers by Coherent X-ray Imaging with 5 nm Resolution

Xing Chen, *Université Paris-Saclay*
AF-10 (DOC-03)
Building Spintronics Neuromorphic Systems with Neural Ordinary Differential Equations

Rachel Nickel, *University of Manitoba*
BF-06 (MOA-11)
Modulating Oxygen Octahedra Tiltings in ε-Fe_2O_3 Nanoparticles using Transition-metal Doping

Yulan Chen, *Cornell University*
BF-07 (MOA-12)
Exploring Magnetic Nanochain Anisotropy for Flexible Composite Micro-Actuators

Cheng-Hsiang Hsu, *University of California Berkeley*
CC-02 (EOF-02)
Enhanced Spin-orbit Torque in Amorphous Light Element Silicide

Poster Sessions

Tuesday **1:30 pm – 4:30 pm**
Wednesday **8:30 am – 11:30 am and 1:30 pm – 4:30 pm**
Thursday **8:30 am – 11:30 am and 1:30 pm – 4:30 pm**
Exhibit Hall

Best Poster Awards

Supported by:

All posters presented in-person are eligible to receive this award. Winners are selected by the Poster Session and Program Chairs, and are based on the level of research, quality of the poster, and clarity of the presentation. Please visit the winning posters displayed in the Exhibit Hall.

SPECIAL SESSIONS

TUTORIAL

Towards 3D Nanomagnetism: Fundamental Aspects and Technological Applications

This session will be held live onsite. The recording will be available on the virtual platform starting November 7.

Monday, October 31
2:00 pm – 4:30 pm
Nicollet Ballroom ABC, Main Floor

Over many decades, research on magnetic materials has focused on two dimensions. Advances in nanofabrication have enabled the realization of sub-micron geometries leading to numerous scientifically interesting novel spin textures that are governed by topology or frustration, sometimes mimicking those found in bulk materials. Recently, the focus has shifted towards artificial three-dimensional magnetic systems that derive from the accomplishments in lower dimensions. This session will focus on recent developments in the field of 3D nanomagnetism, including novel methods for the synthesis and characterization of 3D nanomagnetic structures, the new physics governing the behavior of this type of materials and the emerging potential technological applications of these systems, including the current challenges and prospects.

Speakers:

Olivier Fruchart, *SPINTEC*
Emerging Physics in 3D Nanomagnets

Peter Fischer, *Lawrence Berkeley National Laboratory*
Synthesis and Characterization of 3D Nanomagnetic Structures

Amalio Fernandez-Pacheco, *University of Zaragoza*
Novel Applications of 3D Nanomagnetism

Chaired by **Charudatta Phatak**, *Argonne National Laboratory*

After each presentation there will be a brief question and answer period followed by a roundtable discussion.

VIEW SPECIAL SESSION SPEAKER BIOS HERE

MAGNETIC SENSOR CHALLENGE

Supported by:

Magnetic sensors fill a crucial technology space across multiple industries. While many of you have had a chance to develop materials for or perform laboratory tests on magnetic sensors, it is likely that you didn't fully explore their practical use. To expand these skills, we have created the Magnetic Sensor Challenge.

Teams will be provided with magnetoresistive sensors, magnets, and an Arduino design kit and they will use their creativity to develop a sensor circuit and perform measurements. Each team will submit a Tik-Tok video showcasing their solution and the most creative and best presented solution will win the challenge!

Registration for this event is now closed.

VOTE HERE

MAGNETISM AS ART SHOWCASE

Supported by:

The Magnetism as Art Showcase highlights the beauty of magnetism and magnetic materials. Take a look at all of the amazing submissions on our website HERE and check out the four finalists on display in the Exhibit Hall. **And most importantly, don't forget to vote for your favorite!**

Voting closes at 12:00 pm CT on Wednesday, November 2.

SYMPOSIA

The symposia consist entirely of invited talks by experts in the field. The symposia talks presented live onsite will be recorded and available on the virtual platform starting November 7, along with the prerecorded symposia talks that were not presented onsite.

TUESDAY 8:30 – 11:30 AM

- **SA: 2D van der Waals Magnets for Practical Device Applications**

TUESDAY 1:30 – 4:30 PM

- **SB: Recent Developments in Advanced Magnetic Tunnel Junctions**

  Supported by

WEDNESDAY 8:30 – 11:30 AM

- **SC: Imaging Magnetic Textures at the Nanoscale**

  Supported by:

WEDNESDAY 1:30 – 4:30 PM

- **SD: Metrics and Measurements of Spin-Orbit Torque MRAM**

  Supported by:

THURSDAY 8:30 – 11:30 AM

- **SE: Emerging Researcher Symposium on Artificial Spin Ice and Applications**

THURSDAY 1:30 – 4:30 PM

- **SF: Computing with Spintronic Oscillators**

FRIDAY 8:30 – 11:30 AM

- **SG: Unconventional Spin-Orbit Torques in Ferromagnets, Ferrimagnets, and Antiferromagnets**

VIEW SYMPOSIA AND INVITED SPEAKERS HERE

MEET THE EXPERTS

This event provides young researchers with the exclusive opportunity to participate in a small-group discussion with a distinguished group of magnetism experts and get expert advice on career planning, technical paper writing and publication, job searches and interviews, society involvement, and more. **Registration for this event is now closed.**

VIRTUAL EVENT

Supported by:

Tuesday, November 1
8:00 am – 9:00 am US Central Time
Those students who pre-registered will receive a link by email to join.

Experts:

- **Chunhui Rita Du**, *University of California*
  Spintronics, Quantum sensing/imaging, Two-dimensional materials and topological materials
- **Ravi L Hadimani**, *Virginia Commonwealth University*
  Biomagnetics; Transcranial magnetic stimulationVivian Ng, National University of Singapore
  Nanomagnets
- **Vivian Ng,** *National University of Singapore*
  Nanomagnets
- **Fengxia Hu**, *Chinese Academy of Sciences*
- **Prem Piramanayagam**, *Nanyang Technological University*
  Spintronics
- **Hossein Sepehri Amin**, *National Institute for Materials Science (NIMS)*
  Permanent magnets, Microstructural characterization
- **Qiming Shao**, *The Hong Kong University of Science and Technology*
  Spintronic materials and structures, Quantum computing applications
- **Elin Winkler**, *Balseiro Institute (UNCuyo)*
  Multifunctional nanostructures, Nanomagnetism, Magnetic hyperthermia

ONSITE EVENT

Supported by:

Tuesday, November 1
11:45 am – 1:15 pm
Mirage, 2nd floor
This event is for pre-registered students only.

Experts:

- **Franca Albertini**, *Institute of Materials for Electronics and Magnetism (IMEM)*
- **Ravi L Hadimani**, *Virginia Commonwealth University*
  Biomagnetics; Transcranial magnetic stimulation
- **Yaroslav Mudryk**, *Ames National Laboratory*
  Magnetocaloric materials, magnetic materials (soft and hard magnetic), rare-earth intermetallic, critical materials
- **Montserrat Rivas**, *University of Oveido*
  Bio-magnetic sensors, FORC, Science Communication and Outreach
- **Thomas Schrefl**, *University for Continuing Education Krems*
  Micromagnetics, Permanent magnets
- **Qiming Shao**, *The Hong Kong University of Science and Technology*
  Spintronic materials and structures
- **Juan Luis Palma Solorza**, *Universidad Central de Chile*
  Electron Beam Lithography; Synthesis of metallic and magnetic nanowires; Characterization of Magnetic Nanostructures: VSM, AGFM, SEM, TEM, MOKE; Atomic Force Microscopy, Magnetic Force Microscopy; Micromagnetic Simulations

WOMEN IN MAGNETISM NETWORKING EVENT

Looking Back, Looking Forward

This session will be held live onsite.

Supported by:

Tuesday, November 1
4:30 pm – 6:00 pm
Regency, 2nd floor

Once you have established yourself in your chosen careers, what would you tell your younger self, if you could? What are the lessons learned in the rocky path to breaking the glass ceiling?

The event will feature a panel discussion with several established women in the field of science and technology. The panelists will share what it took for them to get to where they are in their careers, and they will also answer questions from the audience. There will be plenty of time to mix and mingle.

Speakers:
Franca Albertini, *Institute of Materials for Electronics and Magnetism (IMEM)*
Nora Dempsey, *Institut Néel, CNRS Grenoble*
Laura Greene, *Florida State University*
Stephanie Hernandez, *Seagate Research*

Chaired by **Sangita Kalarickal**, *Seagate Technology*

EVENING SESSION 1

Magnetism in Nature and the Universe

This session will be held live onsite. The recording will be available on the virtual platform starting November 7.

Tuesday, November 1
6:00 pm – 7:30 pm
Nicollet Ballroom ABC, Main Floor

In this session, the importance of long-range magnetic fields and cosmic magnetism in general on the formation of the solar system and the early Earth, as well as stars and galaxies, will be overviewed. The processes that create and sustain large-scale magnetism (still not yet understood) will be described, with emphasis on the new methods to assess small magnetic fields from distant objects and the techniques to characterize ancient magnetic fields on Earth from rocks surviving from early times. Importantly, planets, stars, gas clouds, and even entire galaxies are all magnetic. This reveals the importance of magnetic phenomena beyond condensed matter physics and the devices we all currently use in information technologies or biomedicine.

Speakers:
Magnetism Throughout the Universe
Bryan Gaensler, *University of Toronto*

Magnetism During Solar System Formation and on the Early Earth
Roger Rennan Fu, *Harvard University*

Chaired by **Chris Leighton**, *University of Minnesota*

LIVE ONLINE SESSION

How to Create an Effective Scientific Video Presentation

This session will be held live ONLINE. All Conference attendees will receive the link to join by email.

Wednesday, November 2
8:00 am – 9:00 am
LIVE ONLINE

Using videos as communication media is more and more common today as we participate in numerous video meetings, webinars, online virtual conferences, etc. So, we know how to make a video presentation, but making an effective one to win the hearts of the audience will require more! Support this fantastic event which shares with attendees tips to make effective video presentations to convey their work with impact!

Speaker:
Thomas Schrefl, *University for Continuing Education Krems*

MAKING A DIFFERENCE IN MAGNETISM

This session will be held live onsite. Pre-registration is required. **Registration for this event is now closed.**

Wednesday, November 2
11:45 am – 1:15 pm
Greenway Ballroom, 2nd floor

This workshop will feature invited speakers from leadership, publishing, and science communications sectors who will share their insights regarding contributing to Magnetism outside a research laboratory.

Speakers:
Ekkes Brück, *Editor of the Handbook of Magnetism and Magnetic Materials and Journal of Science: Advanced Materials and Devices*
Laura Greene, *Florida State University*
Jian-Ping Wang, *University of Minnesota*

Moderated by **Victorino Franco**, *University of Seville*

STUDENT NETWORKING EVENT

This session will be held live onsite.

Supported by:

Wednesday, November 2
4:30 pm – 6:00 pm
Greenway, 2nd floor

Ever wondered how to be more than a member with IEEE MagSoc? Find out about the opportunities available with the new initiative called Students in Magnetism with Prof. Atsufumi Hirohata at the Student Networking Event. See new and/or familiar faces and get acquainted! This will be an interactive networking event with games, prizes(!), food and beverages, moderated by **Criss Zhang**, who is currently pursuing his PhD at Northeastern University, USA (*that's right, students lead the fun!*).
Students are invited to join us to meet and discuss research ideas, network and build new relationships.

Chaired by **Atsufumi Hirohata**, *University of York*
Moderated by **Xiaoyu (Criss) Zhang**, *Northeastern University*

EVENING SESSION 2

Roundtable Discussion on Advanced Magnetic Materials for Novel Computing Paradigms

This session will be held live onsite. The recording will be available on the virtual platform starting November 7.

Wednesday, November 2
6:00 pm – 7:30 pm
Nicollet Ballroom ABC, Main Floor

Panelists:
Bio-inspired Computing Technologies
Damien Querlioz, *Centre de Nanosciences et de Nanotechnologies*

Spin-wave Computing Technologies
Christoph Adelmann, *imec*

In-memory Cmputing Technologies
Jean Anne Incorvia, *University of Texas at Austin*

Moderated by **Kai Liu**, *Georgetown University*

WRITING WORKSHOP

This session will be held live onsite. Pre-registration is required. **Registration for this event is now closed.**

Thursday, November 3
11:45 am – 1:15 pm
Greenway Ballroom, 2nd floor

Supported by:

SEAGATE

This workshop will consist of three tutorials geared towards helping graduate students and post-doctoral fellows improve their writing skills and techniques.

Speakers:
Writing of Scientific Papers
Vitalij Pecharsky, *Ames Laboratory*

Preparation & Application of Professional Resumes
Mark Kief, *Seagate Technology*

Preparation of Oral Scientific Presentations
Montserrat Rivas, *The University of Oviedo*

Chaired by **Mingzhong Wu**, *Colorado State University*

This workshop is organized by the Technical Committee of IEEE Magnetics Society.

CONEFRENCE ORGANIZATION

CONFERENCE STEERING COMMITTEE

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PROGRAM COMMITTEE (Subcommittee Leads)

Fundamental Properties and Cooperative Phenomena	
Igor Zutic	**University of Buffalo, Dept. of Physics**
Arjun Pathak	State University of New York, Buffalo State
Derek Stewart	Western Digital
Magnetoelectronic Materials and Phenomena	
Karin Leistner	**Technische Universität Chemnitz**
Silvia Piccozzi	**CNR-SPIN**
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Dustin Gilbert	University of Tennessee
Pham Nam Hai	Tokyo Institute of Technology
Yuya Sakuraba	NIMS
Nittin Samarth	Penn State
Spintronics - Fundamentals and Devices	
Saroj Dash	**Chalmers University of Technology**
Takahiro Moriyama	**Institute for Chemical Research, Kyoto University**
Weisheng Zhao	**Fert Beijing Institute, Beihang University**
Vincent Baltz	SPINTEC
Satoru Emori	Virginia Tech
Karin Everschor-Sitte	University Duisburg-Essen
Kohei Hamaya	Osaka University, Japan
Thomas Jungwirth	University of Nottingham
Makoto Kohda	Tohoku University
Waldemar Macedo	Centro de Desenvolvimento da Tecnologia Nuclear
Witold Skowvronsky	AGH University of Science and Technology
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Sumito Tsunegi	AIST
Magnetization Dynamics and Micromagnetics	
Hans Nembach	**NIST Boulder**
Dieter Suess	**University of Vienna**
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Sebastiaan van Dijken	Aalto University
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Yan Zhou	The Chinese University of Hong Kong
Magnetic Recording	
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Simon Greaves	Tohoku University
Chris Rea	Seagate Technology
Soft Magnetic Materials	
Nicoleta Lupu	**National Institute of R&D for Technical Physics**
Ignasi Fina	ICMAB
Eva Pellicer	Autonomous University of Barcelona

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Enric Menéndez	Autonomous University of Barcelona
Hossein Sepehri-Amin	NIMS
Structured Materials	
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Jiayan Law	University of Seville
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VIRTUAL SESSION CHAIRS

AOA	Electronic Structure and Critical Phenomena	Cheng	Gong	University of Maryland	United States
AOB	Low-Dimensional Systems and Frustrated Magnetims	Yaroslav	Mudryk	Iowa State University	United States
AOC	Superconductivity and Quantum Materials	Mahmud	Khan	Miami University	United States
APA	Fundamental Properties and Cooperative Phenomena	Rajesh	Chopdekar	Western Digital	United States
BOA	Complex Oxides	Daniela	Petti	Politecnico di Milano	Italy
BOB	Multiferroic, Magnetoelectric and Half-Metallic Materials	Takahide	Kubota	Tohoku University	Japan
BPA	Multiferroics, Magnetoelectrics, Complex Oxides and Half-Metallics	Ying-Hao	Chu	National Yang Ming Chiao Tung University	Taiwan
COA	Magneto-ionics	Enric	Menendez	Autonomous University of Barcelona	Spain
COB	Topological Insulators, Dirac Materials, 2D and Layered van der Waals Materials I	Marco	Gobbi	CIC nanoGUNE	Spain
COC	Topological Insulators, Dirac Materials, 2D and Layered van der Waals Materials II	Shinobu	Ohya	The University of Tokyo	Japan
CPA	Magnetoelectronic Materials and Phenomena	Markus	Gößler	Chemnitz University of Technology	Germany
DOA	Magnetoresistance in Heterostructures (GMR, TMR, TAMR)	William	Echtenkamp	University of Minnesota	United States
		Simon	Granville	Victoria University of Wellington	New Zealand
DOB	MRAM, Magnetic Logic and Related Devices	Christopher	Safranski	IBM	United States
		Reinoud	Lavrijsen	Eindhoven University of Technology	Netherlands
DOC	Neuromorphic Computing	Joseph	Friedman	The University of Texas at Dallas	United States
DPA	Spintronic Devices for Memory and Computing	Shouzhong	Peng	Beihang University	China
		Luding	Wang	Eindhoven University of Technology	Netherlands

EOA	Antiferromagnetic Spintronics I	Kab-Jin	Kim	Korea Advanced Institute of Science and Technology	Korea (the Republic of)
		Myoung-Woo	Yoo	University of Illinois at Urbana-Champaign	United States
EOB	Antiferromagnetic Spintronics II	Fernando	Ajejas	University of California, San Diego	United States
EOC	Skyrmions I	Olivier	Boulle	SPINTEC	France
EOD	Skyrmions II	Avik	Ghosh	University of Virginia	United States
EOE	Spin-Orbitronics I	Shinji	Isogami	National Institute for Materials Science	Japan
		Tomohiro	Taniguchi	National Institute of Advanced Industrial Science and Technology	Japan
EOF	Spin-Orbitronics II	Victor	Lopez Dominguez	Northwestern University	United States
EPA	Antiferromagnetic Spintronics III	Takeshi	Seki	Tohoku University	Japan
EPB	Skyrmions and Spin-Orbitronics	Yue	Li	Argonne National Laboratory	United States
FOA	Spin Dynamics	Lakhan	Bainsla	University of Gothenburg	Sweden
FOB	Spin Hall and Spin-Orbit Torque I	Simranjeet	Singh	Carnegie Mellon University	United States
FOC	Spin Hall and Spin-Orbit Torque II	Yongxi	Ou	The Pennsylvania State University	United States
FOD	Spin Transport	Bhaskaran	Muralidharan	Indian Institute of Technology	India
		Yuki	Hibino	National Institute of Advanced Industrial Science and Technology	Japan
FPA	Spin Current and Dynamics	Lucas	Caretta	Brown University	United States
GOA	Magnetization Dynamics I	Vijaysankar	Kalappattil	Colorado State University	United States
GOB	Magnetization Dynamics II	Ezio	Iacocca	University of Colorado Colorado Springs	United States
GOC	Magnetization Dynamics III	Steven	Louis	Oakland University	United States

GOD	Magnetization Dynamics IV	Dmytro	Bozhko	University of Colorado Colorado Springs	United States
GOE	Magnetization Dynamics V	Jose Angel	Fernandez-Roldan	Helmholtz Zentrum Dresden-Rossendorf	Germany
		Raghav	Sharma	National University of Singapore	Singapore
GPA	Magnetization Dynamics VI	Joseph	Sklenar	Wayne State University	United States
		Shuyuan	Shi	Beihang University	China
HOA	Magnetic Imaging and Magnetization Dynamics	Andrew	Kunz	Marquette University	United States
HOB	Magnetization Dynamics and Micromagnetics	Gabriel	Chaves-O'Flynn	Polska Akademia Nauk Instytut Fizyki Molekularnej	Poland
HOC	New Approaches in Computational Magnetism	Michael	Donahue	National Institute of Standards and Technology	United States
HOD	Skyrmions: Characterization, Dynamics and Control	Kab-Jin	Kim	Korea Advanced Institute of Science and Technology	Korea (the Republic of)
		Thomas	Winkler	JGU Mainz	Germany
HPA	Magnetization Dynamics and Micromagnetics	Stefan	Pollok	Danmarks Tekniske Universitet	Denmark
		Alexander	Kovacs	Danube University Krems	Austria
HPB	Skyrmions and Domain Walls	Jackson	Ross	University of York	United Kingdom
		Harald	Oezelt	Danube University Krems	Austria
IOA	Magnetic Recording I	Simon	Greaves	Tohoku University	Japan
IOB	Magnetic Recording II	Chris	Rea	Seagate Technology	United States
IPA	Magnetic Recording III	Dafine	Ravelosona	Universite Paris Saclay	France
JOA	Amorphous and Nanocrystalline Soft Magnets I	Manuel	Vázquez	Instituto de Ciencia de Materiales de Madrid	Spain
		Charudatta	Phatak	Argonne National Laboratory	United States

JOB	Ferrites, Garnets and Magneto-Dielectric Materials I	Ramanathan	Mahendiran	National University of Singapore	Singapore
JOC	Soft Magnetic Crystalline Alloys I	Victorino	Franco	University of Seville	Spain
JPA	Amorphous and Nanocrystalline Soft Magnets II	Cristina	Bran	Instituto de Ciencia de Materiales de Madrid	Spain
JPB	Ferrites, Garnets and Magneto-Dielectric Materials II	Chuanpu	Liu	Colorado State University	United States
JPC	Soft Magnetic Crystalline Alloys II	Nicola	Morley	University of Sheffield	United Kingdom
KOA	Hard Magnetic Materials I: Rare Earth-based Compounds	Thomas	Schrefl	Danube University Krems	Austria
KOB	Hard Magnetic Materials IV: Rare-Earth Free Hard Magnetic Materials	Brian	Lejeune	Northeastern University	United States
KOC	Hard Magnetic Materials VI: Nanostructured, Composite and Other Hard Magnetic Materials (Including Intermetallic Alloys and L10 Alloys)	Chuanpu	Liu	Colorado State University	United States
KPA	Hard Magnetic Materials II: Rare Earth-based Compounds	Enric	Menendez	Autonomous University of Barcelona	Spain
KPB	Hard Magnetic Materials III: Rare Earth-based Compounds	Zheng	Ma	Universitat Autònoma de Barcelona	Spain
KPC	Hard Magnetic Materials V: Rare-Earth Free Hard Magnetic Materials	Julius	de Rojas	University of Durham	United Kingdom
KPD	Hard Magnetic Materials VII: Nanostructured, Composite and Other Hard Magnetic Materials (Including Intermetallic Alloys and L10 Alloys)	Xin	Tang	NIMS	Japan
LOA	Thin Films and Patterned Structures	Franca	Albertini	Institute of Materials for Electronics and Magnetism, National Research Council	Italy
LOB	Thin Films and Surface Effects	Paola	Tiberto	INRIM	Italy
		Joao Paulo	Sinnecker	Centro Brasileiro de Pesquisas Físicas	Brazil
LPA	Structured Materials	Yu	Shiratsuchi	Osaka University	Japan

MOA	Nanocomposite Magnetic Materials	Johan	van Lierop	University of Manitoba	Canada
		Amal	El-Ghazaly	Cornell University	United States
MPA	Nanoparticles, Exchange Bias and 3D Structures	Charudatta	Phatak	Argonne National Laboratory	United States
NOA	Magneto-Elastic and -Optical Phenomena	Michelle	Jamer	United States Naval Academy	United States
NOB	Magnetocaloric Materials I	Brittany	Nelson-Cheeseman	University of St. Thomas	United States
NOC	Magnetocaloric Materials II	Nora	Dempsey	Insttitut NEEL CNRS	France
NPA	Magneto-Elastic, -Optical and Other Phenomena	Radhika	Barua	Virginia Commonwealth University	United States
NPB	Magnetocaloric Materials III	Arjun	Pathak	State University of New York, Buffalo State	United States
OOA	Magnetic Sensors and Devices I	Nicoleta	Lupu	National Institute of R&D for Technical Physics	Romania
		Carmine	Clemente	University of Sannio	Italy
OOB	Magnetic Sensors and Devices II	Atsufumi	Hirohata	University of York	United Kingdom
OPA	Magnetic Sensors and Devices III	Diana	Leitao	Eindhoven University of Technology	Netherlands
OPB	Motors, Actuators and Related	Mattia	Butta	Czech Technical University in Prague	Czechia
PPA	Magnetics for Power Electronics and Control	Yongjian	Li	Hebei University of Technology	China
PPB	Shielding, Levitation and Propulsion	Jang-Young	Choi	Chungnam National University	Korea (the Republic of)
PPC	Transformers and Inductors	Xiaojun	Zhao	North China Electric Power University	China
QOA	Biomedical Application of Magnetic Nanoparticles	Frank	Abel	National Institute of Standards and Technology	United States
QOB	Magnetic Stimulation in Biology, Magnetic Fluids and Actuators	Adam	Biacchi	National Institute of Standards and Technology (NIST)	United States

QPA	Applications of Magnetic Nanoparticles in Biomedicine	Eduardo	De Lima Correa	National Institute of Standards and Technology	United States
QPB	Manipulation of Magnetic Fluids	Norman	Wereley	University of Maryland	United States
ROA	Magnetic Characterization from Nano to Macro	Peter	Fischer	Lawrence Berkeley National Laboratory	United States
		Alpha	N'Diaye	Lawrence Berkeley National Laboratory	United States
ROB	Recent Advances In Magnetic Imaging	Roopali	Kukreja	University of California, Davis	United States
		Nanna	Zhou Hagström	Stockholm University	Sweden
RPA	Magnetic Characterization and Imaging	Hendrik	Ohldag	Lawrence Berkeley National Laboratory	United States
		Thomas	Feggeler	Lawrence Berkeley National Laboratory	United States
SA	2D van der Waals Magnets for Practical Device Applications	Manh-Huong	Phan	University of South Florida	United States
		Qiming	Shao	The Hong-Kong University of Science and Technology	China
SB	Recent Developments in Advanced Magnetic Tunnel Junctions	Daniel	Gopman	National Institute of Standards and Technology	United States
SC	Imaging Magnetic Textures at the Nanoscale	Peter	Rickhaus	Qnami AG	Switzerland
SD	Metrics and Measurements of Spin-Orbit Torque MRAM	Shehrin	Sayed	University of California, Berkeley	United States
		Jonathan	Sun	IBM T. J. Watson Research Center	United States
SE	Emerging Researcher Symposium on Artificial Spin Ice and Applications	Peter	Schiffer	Yale University	United States
		Joseph	Sklenar	Wayne State University	United States
SF	Computing with Spintronic Oscillators	Mark	Stiles	National Institute of Standards and Technology	United States

SG	Unconventional Spin-Orbit Torques in Ferromagnets, Ferrimagnets, and Antiferromagnets	Johan	Åkerman	University of Gothenburg	Sweden
TU	Tutorial: Towards 3D Nanomagnetism	Charudatta	Phatak	Argonne National Laboratory	United States
YA	Evening Session 1: Magnetism in Nature and the Universe	Chris	Leighton	University of Minnesota	United States
ZA	Evening Session 2: Roundtable on Advanced Magnetic Materials for Novel Computing Paradigms	Mark	Stiles	National Institute of Standards and Technology	United States

ONSITE SESSION CHAIRS

AA	SYMPOSIUM: 2D van der Waals Magnets for Practical Device Applications	Manh-Huong	Phan	University of South Florida	United States
		Qiming	Shao	The Hong-Kong University of Science and Technology	China
AB	Electronic Structure and Critical Phenomena / Low-D Systems and Frustrated Magnetism	Cheng	Gong	University of Maryland	United States
AC	Recent Advances In Magnetic Imaging	Jenae	Shoup	Theiss Research	United States
		Hendrik	Ohldag	Lawrence Berkeley National Laboratory	United States
AD	Biomedical Application of Magnetic Nanoparticles/Magnetic Stimulation in Biology and Actuators	Adam	Biacchi	National Institute of Standards and Technology (NIST)	United States
AE	Magnetization Dynamics I	Vijaysankar	Kalappattil	Colorado State University	United States
AF	Neuromorphic Computing	Joseph	Friedman	The University of Texas at Dallas	United States
AG	Magnetocaloric Materials I	Brittany	Nelson-Cheeseman	University of St. Thomas	United States
AH	Spin Hall and Spin-Orbit Torque I	Simranjeet	Singh	Carnegie Mellon University	United States
BA	SYMPOSIUM: Recent Developments in Advanced Magnetic Tunnel Junctions	Daniel	Gopman	National Institute of Standards and Technology	United States
BB	Low-D Systems and Frustrated Magnetism	Yaroslav	Mudryk	Iowa State University	United States
BC	Spin-Orbitronics I	Shinji	Isogami	National Institute for Materials Science	Japan
BD	Complex Oxides	Daniela	Petti	Politecnico di Milano	Italy
BE	Magnetization Dynamics II	Ezio	Iacocca	University of Colorado Colorado Springs	United States
BF	Nanocomposite Magnetic Materials	Johan	van Lierop	University of Manitoba	Canada

		Amal	El-Ghazaly	Cornell University	United States
BG	Magnetocaloric Materials II	Nora	Dempsey	Insttitut NEEL CNRS	France
BH	Topological Insulators, Dirac Materials, 2D and Layered van der Waals Materials I	Marco	Gobbi	CIC nanoGUNE	Spain
BP	Skyrmions and Spin-Orbitronics	Yue	Li	Argonne National Laboratory	United States
BQ	Magnetic Sensors and Devices I and Motors, Actuators and Related	Mattia	Butta	Czech Technical University in Prague	Czechia
BR	Spintronic Devices for Memory and Computing	Kevin	Garello	SPINTEC	France
		Erol	Girt	Simon Fraser University	Canada
BS	Magnetization Dynamics and Micromagnetics I	Gabriel	Chaves-O'Flynn	Polska Akademia Nauk Instytut Fizyki Molekularnej	Poland
BT	Multiferroics, Magnetoelectrics, Complex Oxides and Half-Metallics	Takahide	Kubota	Tohoku University	Japan
CA	SYMPOSIUM: Imaging Magnetic Textures at the Nanoscale	Peter	Rickhaus	Qnami AG	Switzerland
CB	Antiferromagnetic Spintronics I	Hua	Chen	Colorado State University	United States
CC	Spin-Orbitronics II	Tomohiro	Taniguchi	National Institute of Advanced Industrial Science and Technology	Japan
CD	Skyrmions I	Yue	Li	Argonne National Laboratory	United States
CE	Magnetization Dynamics III	Steven	Louis	Oakland University	United States
CF	Thin Films and Patterned Structures	Paola	Tiberto	INRIM	Italy
CG	Hard Magnetic Materials I	Thomas	Schrefl	Danube University Krems	Austria
		Nora	Dempsey	Insttitut NEEL CNRS	France
CH	Topological Insulators, Dirac Materials, 2D and Layered van der Waals Materials II / Multiferroic,	Shinobu	Ohya	The University of Tokyo	Japan

	Magnetoelectric and Half-Metallic Materials				
CP	Amorphous and Nanocrystalline Soft Magnets I	Manuel	Vázquez	Instituto de Ciencia de Materiales de Madrid	Spain
CQ	Spin Current and Dynamics/Magnetization Dynamics IV	Dmytro	Bozhko	University of Colorado Colorado Springs	United States
CR	Magnetization Dynamics V	Joseph	Sklenar	Wayne State University	United States
CS	Antiferromagnetic Spintronics II	Stanislas	Rohart	Université Paris-Saclay Faculte des Sciences d'Orsay	France
CT	Magnetoelectronic Materials and Phenomena	Markus	Gößler	Chemnitz University of Technology	Germany
DA	SYMPOSIUM: Metrics and Measurements of Spin-Orbit Torque MRAM	Shehrin	Sayed	University of California, Berkeley	United States
		Jonathan	Sun	IBM T. J. Watson Research Center	United States
DB	Antiferromagnetic Spintronics III	Andrei	Slavin	Oakland University	United States
DC	Magnetic Imaging and Magnetization Dynamics VI	Andrew	Kunz	Marquette University	United States
DD	Skyrmions II	Sebastiaan	van Dijken	Aalto University	Finland
DE	Magnetization Dynamics VII	Alexander	Kovacs	Danube University Krems	Austria
DF	Magnetic Sensors and Devices II	Nicoleta	Lupu	National Institute of R&D for Technical Physics	Romania
DG	Spin Transport	Yuki	Hibino	National Institute of Advanced Industrial Science and Technology	Japan
DH	Magnetoionics	Enric	Menendez	Autonomous University of Barcelona	Spain
		Markus	Gößler	Chemnitz University of Technology	Germany

DP	Skyrmions and Domain Walls/Magnetic Recording III	Pierre-Olivier	Jubert	Western Digital	United States
DQ	Fundamental Properties and Cooperative Phenomena	Arnab	Bose	Johannes Gutenberg University	Germany
DR	Ferrites, Garnets and Magneto-Dielectric Materials I	Yasutomo	Omori	Nihon Denki Kabushiki Kaisha	Japan
DS	Hard Magnetic Materials II	Alexander	Gabay	University of Delaware	United States
DT	Manipulation of Magnetic Fluids / Magnetic Characterization and Imaging	Norman	Wereley	University of Maryland	United States
EA	SYMPOSIUM: Emerging Researcher Symposium on Artificial Spin Ice and Applications	Peter	Schiffer	Yale University	United States
		Joseph	Sklenar	Wayne State University	United States
EB	Magnetoresistance in Heterostructures (GMR, TMR, TAMR)	William	Echtenkamp	University of Minnesota	United States
EC	Magnetization Dynamics and Micromagnetics II	William	Borders	National Institute of Standards and Technology	United States
ED	Skyrmions: Characterization, Dynamics and Control	Razan	Aboljadayel	University of Leeds	United Kingdom
EE	Magnetization Dynamics VIII	Stefan	Pollok	Danmarks Tekniske Universitet	Denmark
EF	Magnetic Sensors and Devices III	Atsufumi	Hirohata	University of York	United Kingdom
		Michael	Page	Air Force Research Laboratory	United States
EG	Thin Films and Surface Effects	Paola	Tiberto	INRIM	Italy
EP	Hard Magnetic Materials III	Zheng	Ma	Universitat Autònoma de Barcelona	Spain
EQ	Structured Materials	Amal	El-Ghazaly	Cornell University	United States
ER	Structured Materials and Nanoparticles, Exchange Bias and 3D Structures	Charudatta	Phatak	Argonne National Laboratory	United States
ES	Magneto-Elastic, -Optical and Other Phenomena I	Michelle	Jamer	United States Naval Academy	United States

FA	SYMPOSIUM: Computing with Spintronic Oscillators	Mark	Stiles	National Institute of Standards and Technology	United States
FB	MRAM, Magnetic Logic and Related Devices	Christopher	Safranski	IBM	United States
		Hyunsoo	Yang	National University of Singapore	Singapore
FC	New Approaches in Computational Magnetism	Dieter	Suess	University of Vienna	Austria
		Claas	Abert	University of Vienna	Austria
FD	Magnetic Characterization from Nano to Macro	Peter	Fischer	Lawrence Berkeley National Laboratory	United States
FE	Superconductivity and Quantum Materials	Mahmud	Khan	Miami University	United States
FF	Magneto-Elastic and -Optical Phenomena	Radhika	Barua	Virginia Commonwealth University	United States
FG	Ferrites, Garnets and Magneto-Dielectric Materials II	Chuanpu	Liu	Colorado State University	United States
FP	Magneto-Elastic, -Optical and Other Phenomena II	Josep	Fontcuberta	ICMAB-CSIC	Spain
FQ	Applications of Magnetic Nanoparticles in Biomedicine	Eduardo	De Lima Correa	National Institute of Standards and Technology	United States
FR	Magnetics for Power Electronics and Control	Alexey	Kovalev	University of Nebraska-Lincoln	United States
FS	Shielding, Levitation and Propulsion / Transformers and Inductors	Jang-Young	Choi	Chungnam National University	Korea (the Republic of)
GA	SYMPOSIUM: Unconventional Spin-Orbit Torques in Ferromagnets, Ferrimagnets, and Antiferromagnets	Johan	Åkerman	University of Gothenburg	Sweden
GB	Spin Hall and Spin-Orbit Torque II	Yongxi	Ou	The Pennsylvania State University	United States
GC	Magnetic Recording	Simon	Greaves	Tohoku University	Japan
GD	Amorphous and Nanocrystalline Soft Magnets II	Montserrat	Rivas	Universidad de Oviedo	Spain
GE	Spin Dynamics	Martina	Ahlberg	University of Gothenburg	Sweden

GF	Hard Magnetic Materials IV	Brian	Lejeune	Northeastern University	United States
		Wei	Tang	Ames Laboratory	United States
GG	Soft Magnetic Crystalline Alloys	Cristina	Bran	Instituto de Ciencia de Materiales de Madrid	Spain
TU	Tutorial: Towards 3D Nanomagnetism	Charudatta	Phatak	Argonne National Laboratory	United States
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FUTURE CONFERENCES

2023 Intermag Conference
May 15-19, 2023, Sendai, Japan

68th Annual Conference on Magnetism and Magnetic Materials
October 30 – November 3, 2023, Dallas, TX

2024 Intermag Conference
May 6 – 11, 2024, Rio de Janeiro, Brazil

16th Joint MMM-INTERMAG Conference
January 13-17, 2025, New Orleans, LA

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Session TU
TUTORIAL: TOWARDS 3D NANOMAGNETISM
Charudatta Phatak, Chair
Argonne National Laboratory, Lemont, IL, United States

TU-01. **Emerging Physics in 3D Nanomagnets.** ***(Invited)*** *O. Fruchart*[1] *1. SPINTEC, Grenoble, France*

TU-02. **Synthesis and Characterization of 3D Nanomagnetic Structures.** ***(Invited)*** *P. Fischer*[1,2] *1. LBNL, Berkeley, CA, United States; 2. UCSC, Santa Cruz, CA, United States*

TU-03. **Novel Applications of 3D Nanomagnetism.** ***(Invited)*** *A. Fernández-Pacheco*[1] *1. CSIC-University of Zaragoza, Insititute of Nanoscience & Materials of Aragon, Zaragoza, Spain*

Session YA
EVENING SESSION 1: MAGNETISM IN NATURE AND THE UNIVERSE
Chris Leighton, Chair
University of Minnesota, Minneapolis, MN, United States

YA-01. **Magnetism Throughout the Universe.** ***(Invited)*** *B.M. Gaensler*[1,2] *1. Dunlap Institute for Astronomy and Astrophysics, University of Toronto, Toronto, ON, Canada; 2. David A. Dunlap Department of Astronomy and Astrophysics, University of Toronto, Toronto, ON, Canada*

YA-02. **Magnetism During Solar System Formation and on the Early Earth.** ***(Invited)*** *R. Rennan Fu*[1] *1. Department of Earth and Planetary Sciences, Harvard University, Cambridge, MA, United States*

Session ZA
EVENING SESSION 2: ROUNDTABLE DISCUSSION ON ADVANCED MAGNETIC MATERIALS FOR NOVEL COMPUTING PARADIGMS
Kai Liu, Chair
Georgetown University, Washington, DC, United States

Topic 1: Bio-inspired Computing Technolgies. ***(Invited)*** *D. Querlioz*[1] *1. CNRS-University Paris-Saclay, Palaiseau, France*

Topic 2: Spin-wave Computing Technologies. ***(Invited)*** *C. Adelmann*[1] *1. imec*

Topic 3: In-memory Computing Technologies. ***(Invited)*** *J.A. Incorvia*[1] *1. University of Texas at Austin*

Session SA
2D VAN DER WAALS MAGNETS FOR PRACTICAL DEVICE APPLICATIONS

Manh-Huong Phan, Co-Chair
University of South Florida, Tampa, FL, United States
Qiming Shao, Co-Chair
The Hong-Kong University of Science and Technology, Kowloon, Hong Kong, China

SA-01. **Skyrmionics/Meronics in 2D Magnets for Device Engineering.** ***(Invited)*** *L. Balicas*[1,2] *1. Physics, Florida State University, Tallahassee, FL, United States; 2. National High Magnetic Field Lab, Tallahassee, FL, United States*

SA-02. **Towards domain-wall devices with 2D van der Waals magnets.** ***(Invited)*** *E.J. Santos*[1,2] *1. School of Physics and Astronomy, The University of Edinburgh, Edinburgh, United Kingdom; 2. Higgs Centre for Theoretical Physics, The University of Edinburgh, Edinburgh, United Kingdom*

SA-03. **Electrical control and spin orbit torques in van der Waals layered magnets.** ***(Invited)*** *H. Kurebayashi*[1], I. Verzhbitskiy[2], S. Khan[1], H. Cheng[2], J. Zhou[2], Y. Feng[2] and G. Eda[2] *1. London Centre for Nanotechnology, University College London, London, United Kingdom; 2. Department of Physics, National University of Singapore, Singapore, Singapore*

SA-04. **Toward room-temperature MRAM devices with wafer-scale 2D Magnets.** ***(Invited)*** *T. Nie*[1] *1. School of Integrated Circuit Science and Engineering, Beihang University, Beijing, China*

SA-05. **Emergent phenomena and device applications of 2D magnetic heterostructures.** ***(Invited)*** *G. Bian*[1] *1. Department of Physics and Astronomy, University of Missouri, Columbia, MO, United States*

Session SB
RECENT DEVELOPMENTS IN ADVANCED MAGNETIC TUNNEL JUNCTIONS

Daniel Gopman, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

SB-01. **Magnetic tunnel junction in modern computing.** ***(Invited)*** *J.Z. Sun*[1] *1. IBM Research, Yorktown Heights, NY, United States*

SB-02. **Energy efficient switching in magnetic tunnel junctions.** ***(Invited)*** *W. Wang*[1] *1. Physics, University of Arizona, Tucson, AZ, United States*

SB-03. **Strategies for Enhancing the Speed and Switching Efficiency of Three-Terminal Magnetic Tunnel Junctions.** ***(Invited)*** *V. Krizakova[1] 1. Department of Materials, ETH Zurich, Zürich, Switzerland*

SB-04. **Perpendicular Magnetic Tunnel Junctions with Crystalline Anisotropy and Energy-efficient Switching of Synthetic Antiferromagnet pMTJs by voltage-controlled exchange coupling and Spin-Orbit-Torque.** ***(Invited)*** *J. Wang*[1], D. Zhang[1], B.R. Zink[1], M. Bapna[2], W. Jiang[1], D. Sousa[1], Y. Liao[3], Z. Zhao[1], Y. Lv[1], P. Sahu[1], D. Lyu[1], H. Li[1], O. Benally[1], A. Naeemi[3], D.B. Gopman[4], S. Majetich[2] and T. Low[1] *1. University of Minnesota, Minneapolis, MN, United States; 2. Carnegie Mellon University, Pittsburg, PA, United States; 3. Georgia Institute of Technology, Atlanta, GA, United States; 4. NIST, Gaithersburg, MD, United States*

SB-05. **MTJ device physics and technologies toward deeply scaled STT-MRAM and probabilistic-computing applications.** ***(Invited)*** *S. Fukami[1] 1. Tohoku University, Sendai, Japan*

SYMPOSIA & SPECIAL SESSIONS

Session SC
IMAGING MAGNETIC TEXTURES AT THE NANOSCALE

Peter Rickhaus, Chair
Qnami AG, Muttenz, Switzerland

SC-01. **Topological Defects in a multiferroic Antiferromagnet.** ***(Invited)*** *A. Finco*[1], A. Haykal[1], S. Fusil[2], P. Kumar[1], P. Dufour[2], A. Forget[3], D. Colson[3], J. Chauleau[3], M. Viret[3], N. Jaouen[4], V. Garcia[2] and V. Jacques[1] *1. Laboratoire Charles Coulomb, Université de Montpellier and CNRS, Montpellier, France; 2. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 3. SPEC, CEA, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France; 4. Synchrotron SOLEIL, Gif-sur-Yvette, France*

SC-02. **Pulling Magnetic Skyrmions out of Thin Air.** ***(Invited)*** *G. Chen*[1,2], C. Ophus[3], R. Lo Conte[4,5], A. Quintana[1], H. Kwon[6], G. Yin[1], C. Won[7], H. Ding[8], R. Wiesendanger[5], Y. Wu[9], A. Schmid[3] and K. Liu[1,2] *1. Georgetown University, Washington, DC, United States; 2. University of California, Davis, Davis, CA, United States; 3. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 4. University of California, Berkeley, Berkeley, CA, United States; 5. University of Hamburg, Hamburg, Germany; 6. Korea Institute of Science and Technology, Seoul, The Republic of Korea; 7. Kyung Hee University, Seoul, The Republic of Korea; 8. Nanjing University, Nanjing, China; 9. Fudan University, Shanghai, China*

SC-03. **Cooperative growth of macrospin and vortex chains in Artificial Spin-Vortex Ice nanomagnetic arrays.** ***(Invited)*** *W.R. Branford*[1], J.C. Gartside[1], K.D. Stenning[1], A. Vanstone[1], T. Dion[2], H.H. Holder[1], D.M. Arroo[3], F. Caravelli[4], M. Saccone[4] and H. Kurebayashi[5] *1. Physics, Imperial College London, London, United Kingdom; 2. Kyushu University, Kyushu, Japan; 3. Materials, Imperial Collge London, London, United Kingdom; 4. Los Alamos National Laboratory, Los Alamos, NM, United States; 5. London Centre for Nanotechnology, University College London, London, United Kingdom*

SC-04. **Three-Dimensional Nanoscale Imaging of Propagating Spin Waves via Time-Resolved X-Ray Laminography.** ***(Invited)*** D. Girardi[1], S. Finizio[2], G. Rubini[1], S. Mayr[2], C. Donnelly[3], F. Maspero[1], S. Cuccurullo[1], J. Raabe[2], E. Albisetti[1] and *D. Petti*[1] *1. Physics, Politecnico di Milano, Milano, Italy; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany*

SC-05. **Nanoscale studies of antiferromagnetic spin-textures.** ***(Invited)*** *K. Wagner*[1], P. Lehmann[1], O. Pylypovskyi[2], N. Hedrich[1], P. Makushko[2], B. Shields[1], T. Kosub[2], D.D. Sheka[3], D. Makarov[2] and P. Maletinsky[1] *1. Departement of Physics, University of Basel, Basel, Switzerland; 2. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, e.V., Dresden, Germany; 3. Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

SYMPOSIA & SPECIAL SESSIONS

Session SD

METRICS AND MEASUREMENTS OF SPIN-ORBIT TORQUE MRAM

Shehrin Sayed, Co-Chair
TDK Headway Technologies, Inc., Milpitas, CA, United States
Jonathan Sun, Co-Chair
IBM T. J. Watson Research Center, Yorktown Heights, NY, United States

SD-01. **Spin-orbit torque switching of magnetic tunnel junctions for memory applications.** ***(Invited)*** *K. Garello*[1], V. Krizakova[2], V. Kateel[4,3], M. Perumkunnil[4], M. Gupta[4], G.S. Kar[4], S. Couet[4] and P. Gambardella[2] *1. Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, SPINTEC, Grenoble, France; 2. Department of Materials (D-MATL), ETH Zurich, Zurich, Switzerland; 3. Department of Electrical Engineering, KU Leuven, Leuven, Belgium; 4. imec, Leuven, Belgium*

SD-02. **Manipulating Sample Symmetry to Generate of Out-of-Plane Anti-Damping Spin-Orbit Torques.** ***(Invited)*** *D.C. Ralph*[1] *1. Physics, Cornell University, Ithaca, NY, United States*

SD-03. **Two-dimensional van der Waals topological materials for SOT-MRAM.** ***(Invited)*** *H. Yang*[1] *1. National University of Singapore, Singapore, Singapore*

SD-04. **Voltage & Current Controlled Nanomagnetism For Memory and Logic.** ***(Invited)*** *R. Ramesh*[1] *1. Physics/ MSE, University of California, Berkeley, CA, United States*

SD-05. **Can interfacial spin-orbit torques make magnetic devices more efficient?** ***(Invited)*** V.P. Amin[1], J. Zemen[2], J. Li[4], P.N. Haney[3] and *M.D. Stiles*[3] *1. Physics, Indiana University Purdue University at Indianapolis, Indianapolis, IN, United States; 2. Department of Electrotechnology, Czech Technical University in Prague, Prague, Czechia; 3. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 4. DFTWorks LLC, Oakton, VA, United States*

Session SE
EMERGING RESEARCHER SYMPOSIUM ON ARTIFICIAL SPIN ICE AND APPLICATIONS

Peter Schiffer, Co-Chair
Yale University, New Haven, CT, United States
Joseph Sklenar, Co-Chair
Wayne State University, Detroit, MI, United States

SE-01. **Artificial spin ice: a rich platform for condensed matter magnetism.** ***(Invited)*** *N. Rougemaille*[1] *1. CNRS - Institut NEEL, Grenoble, France*

SE-02. **High-throughput Immersion Kerr Microscopy of Artificial Spin Ice: a route towards new discoveries and applications.** ***(Invited)*** *D. Sanz Hernandez*[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France*

SE-03. **Phase Transitions in Thermally Active Artificial Kagome Spin Ice.** ***(Invited)*** *K. Hofhuis*[1,2], S.H. Skjærvø[1,2], S. Parchenko[1,2], H. Arava[1,2], Z. Luo[1,2], A. Kleibert[3], P.M. Derlet[4] and L. Heyderman[1,2] *1. Laboratory for Mesoscopic Systems, ETH Zurich, Zurich, Switzerland; 2. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen PSI, Switzerland; 3. Swiss Light Source, Paul Scherrer Institute, Villigen PSI, Switzerland; 4. Condensed Matter Theory Group, Paul Scherrer Institute, Villigen PSI, Switzerland*

SE-04. **How nanomagnets process information.** ***(Invited)*** *M. Saccone*[1,2], F. Caravelli[1], J.C. Gartside[3], K.D. Stenning[3] and W.R. Branford[3] *1. T4, Los Alamos National Laboratory, Los Alamos, NM, United States; 2. CNLS, Los Alamos National Laboratory, Los Alamos, NM, United States; 3. Blackett Laboratory, Imperial College London, London, United Kingdom*

SE-05. **Artificial Spin System Microstate Control for Reconfigurable Magnonics & Neuromorphic Computing.** ***(Invited)*** *J.C. Gartside*[1], K.D. Stenning[1], A. Vanstone[1], T. Dion[3], H.H. Holder[1], F. Caravelli[2], M. Saccone[2], H. Kurebayashi[4] and W.R. Branford[1] *1. Physics, Imperial College London, London, United Kingdom; 2. Center for Nonlinear Studies and Theoretical Division, Los Alamos National Lab, Los Alamos, NM, United States; 3. Physics, Kyushu University, Fukuoka, Japan; 4. Physics, University College London, London, United Kingdom*

SYMPOSIA & SPECIAL SESSIONS

Session SF
COMPUTING WITH SPINTRONIC OSCILLATORS

Mark Stiles, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

SF-01. **Series of synaptic and neuronal operations in a multilayer magnetic tunnel junction network through RF-to-DC and DC-to-RF conversion.** ***(Invited)*** N. Leroux[1], A. Ross[1], A. De Riz[1], D. Markovic[1], D. Sanz Hernandez[1], J. Trastoy[1], P. Bortolotti[1], D. Querlioz[2], L. Martins[3], A. Jenkins[3], R. Ferreira[3], *A. Mizrahi*[1] and J. Grollier[1] *1. CNRS/Thales, Palaiseau, France; 2. CNRS, Paris Saclay University, Palaiseau, France; 3. International Iberian Nanotechnology Laboratory, Braga, Portugal*

SF-02. **Associative Memories using Spin-Torque Oscillator Arrays.** ***(Invited)*** *N. Prasad*[1,2], P. Mukim[1,2], A. Madhavan[2,3] and M.D. Stiles[2] *1. Department of Chemistry and Biochemistry, University of Maryland at College Park, College Park, MD, United States; 2. Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. The Institute for Research in Electronics and Applied Physics, University of Maryland at College Park, College Park, MD, United States*

SF-03. **Voltage-driven Gigahertz Frequency Modulation in Spin Hall Nano-oscillators.** ***(Invited)*** *J. Choi*[1], J. Park[2], M. Kang[1], D. Kim[3], J. Rieh[3], K. Lee[2], K. Kim[2] and B. Park[1] *1. Department of Materials Science and Engineering, KAIST, Daejeon, The Republic of Korea; 2. Department of Physics, KAIST, Daejeon, The Republic of Korea; 3. School of Electrical Engineering, Korea University, Seoul, The Republic of Korea*

SF-04. **Ising Machine Based on Electrically Coupled Spin Hall Nano-Oscillators.** ***(Invited)*** *B.C. McGoldrick*[1], J.Z. Sun[2] and L. Liu[1] *1. Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. IBM Thomas J. Watson Research Center, Yorktown Heights, NY, United States*

SF-05. **Synchronization of Spin-Hall nano-oscillators for nonconventional computing.** ***(Invited)*** *A.A. Awad*[1], S. Muralidhar[1], M. Zahedinejad[1], A. Houshang[1], R. Khymyn[1] and J. Åkerman[1] *1. Department of physics, Gothenburg University, Gothenburg, Sweden*

Session SG
UNCONVENTIONAL SPIN-ORBIT TORQUES IN FERROMAGNETS, FERRIMAGNETS, AND ANTIFERROMAGNETS

Johan Åkerman, Chair
University of Gothenburg, Gothenburg, Sweden

SG-01. **Quantum Sensing and Imaging of Spin Dynamics in Quantum Materials.** ***(Invited)*** *C. Du*[1] *1. Physics, University of California, San Diego, San Diego, CA, United States*

SG-02. **Tilted spin current generated by the collinear antiferromagnet RuO_2.** ***(Invited)*** *A. Bose*[1] and D.C. Ralph[2] *1. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 2. Dept. of Physics, Cornell University, Ithaca, NY, United States*

SG-03. **Composition dependent threshold current polarity in ferrimagnetic spin Hall nano-oscillators based on GdFeCo.** ***(Invited)*** *L. Bainsla*[1], A.A. Awad[1], R. Khymyn[1] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden*

SG-04. **Spin-orbit torque induced magnetization switching in single ferromagnetic layer.** ***(Invited)*** L. Liu[1], C. Zhou[1] and *J. Chen*[1] *1. Materials Science and Engineering, National University of Singapore, Singapore, Singapore*

SG-05. **Efficient field-free spin-orbit torque switching in magnetic trilayers.** ***(Invited)*** J. Ryu[1], S. Kim[1], J. Kang[1], M. Kohda[2], J. Nitta[2], K. Lee[1] and *B. Park*[1] *1. KAIST, Daejeon, The Republic of Korea; 2. Tohoku University, Tohoku, Japan*

Session AOA
ELECTRONIC STRUCTURE AND CRITICAL PHENOMENA

Cheng Gong, Chair
University of Maryland, College Park, MD, United States

AOA-01. **Anomalous Valley Hall Effect in *A*-type Antiferromagnetic Van der Waals Heterostructures.** *Y. Zhu*[1] and H. Yang[1] *1. Ningbo Institute of Materials Technology and Engineering, CAS, Ningbo, China*

AOA-02. **Withdrawn**

AOA-03. **(Magneto-)Optical properties of ferromagnetic bcc Fe: First-principles description of electron, lattice, and magnetic temperatures.** ***(Invited)*** *K. Kang*[1], D.G. Cahill[1] and A. Schleife[1] *1. Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States*

AOA-04. **Topological features in real and reciprocal space: a case study of metallic ferrimagnet Mn_4N.** *T. Bayaraa*[1] and S. Griffin[1] *1. Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

AOA-05. **Ab initio Crystal Field Splittings for Lanthanide Dopants in Oxide Materials for Quantum Information.** *Y. Shi*[1] and M.E. Flatté[1] *1. Department of Physics and Astronomy, University of Iowa, Iowa City, IA, United States*

AOA-06. **Magnetic Phase Diagram of the Mott Insulator NiS_2 *vs.* Electron and Hole Doping.** *B. Das*[1], M. Maiti[1], B. Voigt[1], S. El-Khatib[2], K. Heltemes[1], W. Moore[1], M. Manno[1] and C. Leighton[1] *1. Chemical Engineering and Materials Science, University of Minnesota-Twin Cities, Minneapolis, MN, United States; 2. Physics, American University of Sharjah, Sharjah, United Arab Emirates*

AOA-07. **Optimization of electronic correlations and magnetism in $SrCo_2As_2$ via hole doping.** *A. Pandey*[1] and Y. Liu[2] *1. School of Physics, University of the Witwatersrand, Johannesburg, South Africa; 2. Crystal Growth Facility, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland*

AOA-08. **Role of Cationic Size Mismatch to Control the Effect of A-site Disorder.** *A. Khatun*[1,4], P. Aich[1,4], A. Schoekel[2], S. Panda[3], N. Mohapatra[3] and D. Topwal[1,4] *1. Physics, Institute of Physics, Bhubaneswar, India; 2. DESY Photon Science, Deutsches Elektronen - Synchrotron, Hamburg, Germany; 3. School of Basic Sciences, Indian Institute of Technology Bhubaneswar, Bhubaneswar, India; 4. Homi Bhabha National Institute, Mumbai, India*

AOA-09. **Magnetic Anisotropy as an Evidence of Local Magnetic Moments in Paramagnetic Phase of Cr-V Alloys.** L.M. de Oliveira[1], P.N. de Souza[2], F. Yokaichiya[3], P.C. de Camargo[4] and *A.J. de Oliveira*[5] *1. Colegiado de Ciências da Natureza, Universidade Federal do Vale do São Francisco, Senhor do Bonfim, Brazil; 2. Instituto de Física, Universidade de Brasília, Brasília, Brazil; 3. Departamento de Física, Universidade Federal do Paraná, Curitiba, Brazil; 4. Instituto de Estudos Avançados e Estratégicos, Universidade Federal de São Carlos, São Carlos, Brazil; 5. Departamento de Física, Universidade Federal de São Carlos, São Carlos, Brazil*

AOA-10. **Withdrawn**

Session AOB
LOW-DIMENSIONAL SYSTEMS AND FRUSTRATED MAGNETIMS

Yaroslav Mudryk, Chair
Iowa State University, Ames, IA, United States

AOB-01. **Tuning exchange interactions in 1*T*-VSe_2 monolayer by alkali metal adsorption and electride substrate.** *J. Jiang*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

AOB-02. **Spin Dependent Electronic Structure and Magnetic Properties of Fe/Chiral Methylbenzylamine-PbI_4 Spinterfaces.** *Y. Xu*[1] and W. Mi[1] *1. Department of Applied Physics, Tianjin University, Tianjin, China*

AOB-03. **Axial Higgs mode detected by quantum pathway interference in RTe_3. *(Invited)*** *Y. Wang*[1], I. Petrides[2], G. McNamara[1], S. Lei[6], Y. Wu[3], J. Hart[4], J. Yan[3], D. Xiao[5], J.J. Cha[4], P. Narang[2], L. Schoop[6] and K. Burch[1] *1. Physics, Boston College, Boston, MA, United States; 2. John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, United States; 3. Physics, University of Massachusetts Amherst, Amherst, MA, United States; 4. Materials Science, Cornell University, Ithaca, NY, United States; 5. Physics, Washington University, Seattle, WA, United States; 6. Chemistry, Princeton University, Princeton, NJ, United States*

AOB-04. **Magnetic domain phase in van der Waals ferromagnet Fe_3GeTe_2 coupled to Co magnetic vortex state.** *T. Wang*[1], A. Scholl[3], A. N'Diaye[3], X. Huang[2], H. Zhang[2], X. Zhang[4], C. Hwang[5], R. Ramesh[2] and Z.Q. Qiu[1] *1. Department of Physics, University of California, Berkeley, Berkeley, CA, United States; 2. Materials Science & Engineering, University of California, Berkeley, Berkeley, CA, United States; 3. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 4. King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia; 5. Korea Research Institute of Standards and Science, Yuseong, The Republic of Korea*

AOB-05. **Evolution of anisotropic magnetic properties through helix-to-fan transition in a helical antiferromagnet $EuCo_2As_2$.** *J. Kim*[1], M. Kim[1], J. Hong[1], H. Shin[1], K. Jeong[1], J. Kim[1], K. Moon[1], N. Lee[1] and Y. Choi[1] *1. Department of Physics, Yonsei university, Seoul, The Republic of Korea*

AOB-06. **Tailoring spin-dependent tunneling transport in switchable molecules based magnetic tunnel junctions.** L. Jerro[1], F. Godel[1], S. Collin[1], A. Vecchiola[1], K. Bouzehouane[1], P. Yu[2], T. Mallah[2], F. Petroff[1], P. Seneor[1] and *R. Mattana*[1] *1. Unite Mixte de Physique CNRS-Thales, Palaiseau, France; 2. ICMMO, Orsay, France*

AOB-07. **Electron Paramagnetic Resonance of Alkali Metal Atoms and Dimers on MgO.** *S. Kovarik*[1], R. Robles[2], R. Schlitz[1], T.S. Seifert[1,3], N. Lorente[2,4], P. Gambardella[1] and S. Stepanow[1] *1. Department of Materials, ETH Zurich, Zurich, Switzerland; 2. Centro de Física de Materiales, San Sebastian, Spain; 3. Department of Physics, Freie Universitat Berlin, Berlin, Germany; 4. Donostia International Physics Center, San Sebastian, Spain*

AOB-08. **Critical dielectric susceptibility at a magnetic BEC quantum critical point.** *D. Flavian Blasco*[1], S. Hayashida[1], Z. Yan[1], K. Povarov[1], S. Gvasaliya[1] and A. Zheludev[1] *1. ETH Zurich, Zurich, Switzerland*

AOB-09. **Direct exchange-interactions boost magnetic frustration and a large zero-point entropy in the novel $MnTa_2N_4$ diamond-lattice spinel.** R. Trócoli[1], C. Frontera[1], J. Oró-Solé[1], C. Ritter[2], P. Alemany[3,4], E. Canadell[1], M. Palacín[1], A. Fuertes[1] and *J. Fontcuberta*[1] *1. ICMAB-CSIC, Bellaterra, Spain; 2. Institut Laue-Langevin, Grenoble, France; 3. Departament de Ciència de Materials i Química Física, Universitat Barcelona, Barcelona, Spain; 4. Institut de Química Teòrica i Computacional (IQTCUB), Universitat Barcelona, Barcelona, Spain*

AOB-10. **Energy-level-dependent magnetic characters of Ferrimagnetic TbCo film.** J. Park[1], W. Kim[2], W. Won[1], J. Kang[2], S. Lee[4], B. Park[4], B. Ham[3], F. Rotermund[1] and *K. Kim*[1] *1. Physics, KAIST, Daejeon, The Republic of Korea; 2. Samsung, HwaSeong, The Republic of Korea; 3. GIST, Gwangju, The Republic of Korea; 4. Materials Science and Engineering, KAIST, Daejeon, The Republic of Korea*

AOB-11. **Partial lifting of Degeneracy in the J1-J2-J3 Ising Antiferromagnet on the Kagome Lattice.** *J. Colbois*[1,2], B. Vanhecke[3], L. Vanderstraeten[4], A. Smerald[5], F. Verstraete[4] and F. Mila[1] *1. Institut de Physique, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; 2. CNRS / Université Paul Sabatier, Toulouse, France; 3. Faculty of Physics, University of Vienna, Vienna, Austria; 4. Department of Physics and Astronomy, University of Ghent, Ghent, Belgium; 5. Campus Alpin, KIT, Garmisch-Partenkirchen, Germany*

AOB-12. **Magnetic memory effect in nanocrystalline nickel ferrites having controlled cation distribution.** *S. Arackal*[1], R. Kahmei[1], N. Bhat[1], S.A. Shivashankar[1] and R. Sai[2,1] *1. Centre for Nano Science and Engineering, Indian Institute of Science, Bengaluru, India; 2. Tyndall National Institute, Cork, Ireland*

AOB-13. **Magnetic Relaxation Dynamics of Frustrated Glassy Tetragonal Spinel $Cu_{0.2}Zn_{0.8}FeMnO_4$.** *S.K. Jena*[1], T. Sarkar[2], B. Weise[3] and S. Thota[1] *1. Physics, Indian Institute of Technology Guwahati, Guwahati, India; 2. Materials Science and Engineering, Uppsala University, Uppsala, Sweden; 3. Institute for Complex Materials, Leibniz-IFW Dresden, Dresden, Germany*

Session AOC
SUPERCONDUCTIVITY AND QUANTUM MATERIALS
Mahmud Khan, Chair
Miami University, Oxford, OH, United States

AOC-01. **Antiferromagnetic ordering and its interplay with superconductivity in Mn doped $CaKFe_4As_4$.** *A. Sapkota*[1,2], J.M. Wilde[1,2], M. Xu[1,2], P.C. Canfield[1,2], S.L. Bud'ko[1,2], A. Kreyssig[4], Y. Furukawa[1,2], W. Tian[3] and Q. Ding[1] *1. Ames National Laboratory, Ames, IA, United States; 2. Iowa State University, Ames, IA, United States; 3. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 4. Ruhr University, Bochum, Germany*

AOC-02. **Withdrawn**

AOC-03. **Ferromagnetic Josephson Junctions for Cryogenic Memory. *(Invited)*** *N.O. Birge*[1] *1. Physics and Astronomy, Michigan State University, East Lansing, MI, United States*

AOC-04. **Spin Pumping Long-Range Triplet Currents into Superconducting Nb Through Cr/Fe Interfaces.** *A.K. Chan*[1,2], M. Cubukcu[2], X. Montiel[3], S. Komori[3], A. Vanstone[1], J. Thompson[3], G. Perkins[1], M. Blamire[3], J. Robinson[3], M. Eschrig[4], H. Kurebayashi[2] and L. Cohen[1] *1. Physics, Imperial College London, London, United Kingdom; 2. Electronic and Electrical Engineering, University College London, London, United Kingdom; 3. Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; 4. Physics, University of Greifswald, Greifswald, Germany*

AOC-05. **Withdrawn**

AOC-06. **Growth and vortex state study of Fe (Te, Se) superconducting thin films on YSZ substrates.** R. Kumar[1], A. Mitra[1] and *G.D. Varma*[1] *1. Physics, Indian Institute of Technology Roorkee, Roorkee, India*

AOC-07. **Magneto-transport phenomena of rare-earth-based kagome magnet.** J.F. Casey[1], C. Hanley[1], P. Manfrinetti[2] and *A. Pathak*[1] *1. Department of Physics, State University of New York (SUNY), Buffalo, NY, United States; 2. Department of Chemistry, University of Genova, Genova, Italy*

AOC-08. **Spin-flip-driven reversal of the angle-dependent magnetic torque in layered antiferromagnetic $Ca_{0.9}Sr_{0.1}Co_2As_2$.** *J. Seo*[1], J. Kim[1], M. Kim[1], K. Jeong[1], H. Shin[1], J. Hong[1], J. Kim[1], K. Moon[1], N. Lee[1] and Y. Choi[1] *1. Physics, Yonsei University, Seoul, The Republic of Korea*

AOC-09. **Magnonic dispersion of Er_2O_3.** M.E. Flatté[1] and *M. Maleki Sanukesh*[1] *1. Physics and Astronomy, University of Iowa, Iowa city, IA, United States*

AOC-10. **A toolbox for evaluation and optimization of proximity-induced magnetism in $MnTe/Bi_2Te_3$ heterostructures.** G. Awana[1], R. Fujita[2], A. Frisk[3], P. Chen[7], Q. Yao[7], A. Caruana[4], C. Kinane[4], N. Steinke[5], S. Langridge[4], P. Olalde-Velasco[3], S. Dhesi[3], G. van der Laan[3], X. Kou[7], S. Zhang[6], T. Hesjedal[2] and *D. Backes*[3] *1. Department of Physics, Loughborough University, Loughborough, United Kingdom; 2. Department of Physics, University of Oxford, Oxford, United Kingdom; 3. Diamond Light Source, Didcot, United Kingdom; 4. ISIS Neutron and Muon Source, Oxon, United Kingdom; 5. Institut Laue-Langevin, Grenoble, France; 6. School of Physical Science and Technology, ShanghaiTech University, Shanghai, China; 7. School of Information Science and Technology, ShanghaiTech University, Shanghai, China*

POSTER SESSIONS

Session APA

FUNDAMENTAL PROPERTIES AND COOPERATIVE PHENOMENA (Poster Session)

Rajesh Chopdekar, Chair
Western Digital, San Jose, CA, United States

APA-01. **Competing magnetic states in Sm_7Pd_3.** *R.K. Chouhan*[2], A. Biswas[2], Y. Mudryk[2] and V. Pecharsky[2,1] *1. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States; 2. Ames National Laboratory, Ames, IA, United States*

APA-02. **Structural and Dielectric Behavior of $(Ho_{(1-x)}Nd_x)_2CoMnO_6$ ($x = 0.0 – 0.2$) Double Perovskite.** *N. Nayak*[1] and S. Ravi[1] *1. Physics, IIT Guwahati, Guwahati, India*

APA-03. **Intrinsic origin of phase transition in FeRh.** M. Park[2], J. Park[1], K. Kim[1] and *M. Jung*[2] *1. Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Department of Physics, Sogang University, Seoul, The Republic of Korea*

APA-04. **Withdrawn**

APA-05. **Withdrawn**

APA-06. **Magnetic Phase Diagram of Antiferromagnetic Cr-Nb Alloys.** *P.N. de Souza*[1], L.M. Oliveira[2], F. Yokaichiya[3], P.C. de Camargo[4] and A.J. de Oliveira[4] *1. Inst. of Physics, Universidade de Brasilia, Brasilia, Brazil; 2. Colegiado de Ciências da Natureza, Campus Senhor do Bonfim, Universidade Federal do Vale do São Francisco, Petrolina, Brazil; 3. Dept. of Physics, Federal University of Paraná, Curitiba, Brazil; 4. Dept. of Physics, Federal University of Sao Carlos, Sao Carlos, Brazil*

APA-07. **Exchange Bias Effect in 6H $Ba_3Co_{0.5}Mn_{0.5}Ru_2O_9$: Effect of Magnetic Short-Range Interactions.** *M.M. Kurian*[1,2] and S. Nagappan Nair[1,2] *1. Department of Physics, Indian Institute of Technology, Madras, Chennai, India; 2. Functional Oxides Research Group, Indian Institute of Technology, Madras, Chennai, India*

APA-08. **Antiferromagnetic Behavior in the Frustrated Intermetallic Compounds Pr_2Pd_2X (X = In, Sn).** *R. Djoumessi*[1], S. Xhakaza[1], B. Sahu[1] and A. Strydom[1] *1. Physics, University of Johannesburg, Johannesburg, South Africa*

APA-09. **Structural and Magnetic properties of α–CoV_2O_6 and Cr doped α–CoV_2O_6.** *M. Mulibana*[1], P. Mohanty[1], A.R. Prinsloo[1], C.J. Sheppard[1] and B.S. Jacobs[1] *1. Physics, University of Johannesburg, Johannesburg, South Africa*

APA-10. **Superconducting Fluctuation Effect on Epitaxially Layered Films of Superconductor NbN and Half-Metallic Heusler Alloy Co_2MnSi.** *I. Shigeta*[1], S. Oku[1], T. Kubota[2], S. Kimura[2], T. Seki[2], B. Shinozaki[4], S. Awaji[2], K. Takanashi[3,2] and M. Hiroi[1] *1. Kagoshima University, Kagoshima, Japan; 2. Tohoku University, Sendai, Japan; 3. Japan Atomic Energy Agency, Ibaraki, Japan; 4. Kyushu University, Fukuoka, Japan*

APA-11. **Superconducting properties of RE doped GdBa2Cu3O7-δ polycrystalline bulk.** *K. Choi*[1], H. Lee[1], J. Choi[1], T. Lee[1], K. Kim[2], Y. Sur[2] and C. Lee[2] *1. Hyundai Motors Company, Uiwang-Si, The Republic of Korea; 2. Seoul National University, Seoul, The Republic of Korea*

APA-12. **Weak itinerant ferromagnetic behaviour in *Al* substituted $Ni_{92}Cr_8$ alloys.** *D. Patra*[1], S. Vishvakarma[2], P.D. Babu[2] and S. Veeturi[1] *1. Department of Physics, Indian Institute of Technology Madras, Chennai, India; 2. UGC-DAE Consortium for Scientific Research, Mumbai, India*

APA-13. **Quantum Hall Effect Systems of Electrons with Anisotropic Patterns.** *O. Ciftja*[1] *1. Physics, Prairie View A&M University, Prairie View, TX, United States*

APA-14. **Spin Nematic Liquid of the S=1/2 Distorted Diamond Spin Chain in Magnetic Field.** *T. Sakai*[1,2] *1. University of Hyogo, Hyogo, Japan; 2. National Institute for Quantum Science and Technology, Hyogo, Japan*

APA-15. Magnetic Coupling of Divalent Metal Centers in Post Synthetic Metal Exchanged Bimetallic DUT-49 MOFs by EPR interrogations. *K. Thangavel*[1,2], M. Mendt[1], B. Garai[3], V. Bon[3], S. Kaskel[3] and A. Pöppl[1] *1. Felix Bloch Institute for Solid State Physics, University of Leipzig, Leipzig, Germany; 2. School of Chemistry, Cardiff University, Cardiff, United Kingdom; 3. Department of inorganic Chemistry, Technische Universität Dresden, Dresden, Germany*

ORAL SESSIONS

Session BOA
COMPLEX OXIDES
Daniela Petti, Chair
Politecnico di Milano, Milano, Italy

BOA-01. Strain-Stabilized Room-Temperature Valence/Spin-State/Metal-Insulator Transitions in Pr-Based Perovskite Cobaltites. ***(Invited)*** V. Chaturvedi[1], S. Ghosh[1], D. Gautreau[1,2], W.M. Postiglione[1], J.E. Dewey[1], P. Quarterman[3], P.P. Balakrishnan[3], B. Kirby[3], H. Zhou[4], A. Huon[5], T. Charlton[6], M.R. Fitzsimmons[6,7], C. Korostynski[1], A. Jacobson[1], L. Figari[1], J.G. Barriocanal[8], T. Birol[1], A. Mkhoyan[1] and *C. Leighton*[1] *1. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 2. Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 3. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 4. Advanced Photon Source, Argonne National Laboratory, Lemont, IL, United States; 5. Thermo Fisher Scientific, Hillsboro, OR, United States; 6. Neutron Scattering Division, Oak Ridge National Lab, Oak Ridge, TN, United States; 7. Physics and Astronomy, University of Tennessee, Knoxville, TN, United States; 8. Characterization Facility, University of Minnesota, Minneapolis, MN, United States*

BOA-02. Phase-Coexistence *vs.* Quantum-Critical Scenarios in Strain-Tuned Epitaxial Films of Pr-Based Perovskite Cobaltites. *J.E. Dewey*[1], V. Chaturvedi[1], S. Ghosh[1], W.M. Postiglione[1], P. Quarterman[2], P.P. Balakrishnan[2], B. Kirby[2], L. Figari[1], C. Korostynski[1], A. Jacobson[1], A. Mkhoyan[1] and C. Leighton[1] *1. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 2. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States*

BOA-03. Temperature Dependence of Magnetic Anisotropy and Domain Tuning in $BaTiO_3$(111)/CoFeB Multiferroic Heterostructures. *R.G. Hunt*[1], K. Franke[1], P.S. Keatley[2], P.M. Shepley[1] and T.A. Moore[1] *1. Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Physics and Astronomy, University of Exeter, Exeter, United Kingdom*

BOA-04. **Fin-geometry Multiferroic $BiFeO_3/CoFe_2O_4$ Nanocomposites formed by templated self-assembly.** *T. Su*[2] and C.A. Ross[1] *1. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

BOA-05. **Large Converse Magnetoelectric Effect in Strain-Engineered Multiferroic Heterostructures.** L. Garten[1], *M. Staruch*[2], T.R. Mion[2], J. Wollmershauser[2], K. Bussmann[2] and P. Finkel[2] *1. Georgia Institute of Technology, Atlanta, GA, United States; 2. US Naval Research Laboratory, Washington, DC, United States*

BOA-06. **Enhancement of phase transition temperature beyond room temperature by formation of $Ga_{0.8}Fe_{1.2}O_3$ – $Y_3Fe_5O_{12}$ composite.** *S. Hait*[1] and K. Mandal[1] *1. Condensed Matter and Materials Physics, Satyendra Nath Bose National Centre for Basic Sciences, Kolkata, India*

BOA-07. **Exchange bias effect in Ruddlesden-Popper and 6H perovskites: Role of glassy magnetic phase.** M.M. Kurian[1], R.R. Das[1], V. Anusree[1] and *S. Nagappan Nair*[1] *1. Physics, Indian Institute of Technology Madras, Chennai, India*

BOA-08. **Magnetism and Electron Spin Resonance (ESR) in Mo-doped $LaMnO_3$.** *Y. Lee*[1] and R. Mahendiran[1] *1. Physics, National University of Singapore, Singapore, Singapore*

BOA-09. **Coexistence of Magnetic Phases in $SrMnO_3$ Thin Films Revealed by Phase Shifted Angle Dependent Spin Hall Magnetoresistance.** *J. van Rijn*[1], D. Wang[2], B. Sanyal[2] and T. Banerjee[1] *1. Zernike Institute for Advanced Materials, University of Groningen, Groningen, Netherlands; 2. Department of Physics and Astronomy, Ångströmlaboratoriet, Uppsala University, Uppsala, Sweden*

BOA-10. **Theory of absorption of the Shastry-Sutherland compound $SrCu_2(BO_3)_2$.** *S. Miyahara*[1] *1. Fukuoka University, Fukuoka, Japan*

BOA-11. **Functional properties of Yttrium Iron Garnett thin films on graphene-coated $Gd_3Ga_5O_{12}$ for remote epitaxial transfer.** *S. Leontsev*[1], P. Shah[1], H.S. Kum[3,2], J. McChesney[4], F. Rodolakis[4], M. van Veenendaal[5], M. Velez[1], R. Rao[1], D. Haskel[4], J. Kim[2], A. Reed[1] and M. Page[1] *1. Air Force Research Laboratory, Dayton, OH, United States; 2. Massachusetts Institute of Technology, Cambridge, MA, United States; 3. Yonsei University, Seoul, The Democratic People's Republic of Korea; 4. Argonne National Laboratory, Lemont, IL, United States; 5. Northern Illinois University, DeKalb, IL, United States*

BOA-12. **Anomalous and Topological Hall Effect in Magnetic Weyl Semimetallic Candidate $Eu_2Ir_2O_7$ (111) Epitaxial Thin Film.** *M. Ghosh*[1] and P. Kumar[1] *1. Department of Physics, Indian Institute of Science, Bangalore, India*

BOA-13. **Room Temperature Ferroelectricity and Multiferroicity in Off-stoichiometric Canted Antiferromagnet $LuFeO_3$ Thin Films.** *E. Cho*[1] and C.A. Ross[1] *1. Department of Materials Science and Engineering, MIT, Cambridge, MA, United States*

BOA-14. **Withdrawn**

BOA-15. **Long-range antiferromagnetic order in highly-strained (111)-oriented $LaNiO_3$ thin films.** *P.P. Balakrishnan*[1], M. Kane[2], M.R. Fitzsimmons[5], T. Charlton[5], A. Suter[3], M. Holtz[4], A.J. Grutter[1] and Y. Suzuki[2] *1. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 2. Stanford University, Stanford, CA, United States; 3. Swiss Muon Source, Paul Scherrer Institut, Villigen, Switzerland; 4. Colorado School of Mines, Golden, CO, United States; 5. Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

ORAL SESSIONS

Session BOB

MULTIFERROIC, MAGNETOELECTRIC AND HALF-METALLIC MATERIALS

Takahide Kubota, Chair

Tohoku University, Sendai, Japan

BOB-01. **A type-II multiferroic in two dimensions.** ***(Invited)*** *R. Comin*[1] *1. MIT, Cambridge, MA, United States*

BOB-02. **Inducing ferroelectricity in NH_4I via doping of deuterons, bromide and potassium.** *M. Zhao*[1], L. Meng[1], C. Peng[1], Y. Xu[1] and F. Yen[1] *1. Harbin Institute of Technology, Shenzhen, Shenzhen, China*

BOB-03. **Ferroelectricity Based on Orbital Resonance of Protons in CH_3NH_3Cl and CH_3NH_3Br.** *L. Meng*[1], C. Peng[1], Y. Xu[1], T. Xing[1], P. Ren[1] and F. Yen[1] *1. Science, Harbin Institute of Technology, Shenzhen, Shenzhen, China*

BOB-04. **Ferromagnetic hysteresis loop induced by electric field-effect on $Pt/CoFe_2O_4$.** *L. Sakakibara*[1], Y. Katayama[1], T. Koyama[2,3], D. Chiba[2,3] and K. Ueno[1] *1. Graduate School of Arts and Sciences, University of Tokyo, Tokyo, Japan; 2. Institute of Scientific and Industrial Research (SANKEN), Osaka University, Ibaraki, Japan; 3. Center for Spintronics Research Network at Osaka, Osaka University, Toyonaka, Japan*

BOB-05. **Magnetic nanoprecipitates and interfacial spin disorder in zero-field-annealed $Ni_{50}Mn_{45}In_5$ Heusler alloys as seen by magnetic small-angle neutron scattering.** *M. Bersweiler*[1], P. Bender[2], I. Peral[1], E. Pratami Sinaga[1], D. Honecker[3], D. Alba Venero[3], I. Titov[1] and A. Michels[1] *1. Department of Physics and Materials Science, University of Luxembourg, Luxembourg, Luxembourg; 2. Heinz Maier-Leibnitz Zentrum, Technische Universität München, Garching, Germany; 3. ISIS Neutron and Muon Facility, Rutherford Appleton Laboratory, Chilton, United Kingdom*

BOB-06. **Withdrawn**

BOB-07. **Withdrawn**

BOB-08. **Asymmetric skew-scattering dominated anomalous Nernst effect in spin gapless semiconductors $Co_{1+x}Fe_{1-x}$ CrGa.** *A. Chanda*[1], D. Rani[2], J. Nag[3], A. Alam[3], K. Suresh[3], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Physics, Indian Institute of Technology Delhi, New Delhi, India; 3. Physics, Indian Institute of Technology Bombay, Mumbai, India*

BOB-09. **Structural and Magnetic Properties of CoFeVGe: Experiment and Theory.** *P. Kharel*[1], Z. Lehmann[1], G. Baker[1], L. Stuelke[2], S. Valloppilly[3], P. Shand[2] and P. Lukashev[2] *1. Physics, South DakotaState University, Brookings, SD, United States; 2. Physics, University of Northern Iowa, Cedar Falls, IA, United States; 3. Nebraska Center for Materials and Nanoscience, University of Nebraska, Lincoln, NE, United States*

BOB-10. **Low energy multiferroic magnetic domain-wall logic.** *X. Li*[1], H. Singh[2], Y. Bao[1], Q. Luo[1], S. Li[1], J. Chatterjee[2], M. Goikoetxea[5], Z. Xiao[3], N. Tamura[4], R.N. Candler[3], L. You[1], J. Bokor[2] and J. Hong[1,2] *1. Huazhong university of Science and Technology, WuHan, China; 2. Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, Berkeley, CA, United States; 3. University of California, Los Angeles, Los Angeles, CA, United States; 4. Lawrence Berkeley National Lab, Berkeley, CA, United States; 5. University of the Basque Country, Euskadi, Spain*

Session BPA
MULTIFERROICS, MAGNETOELECTRICS, COMPLEX OXIDES AND HALF-METALLICS
(Poster Session)
Ying-Hao Chu, Chair
National Yang Ming Chiao Tung University, Hsinchu, Taiwan

BPA-01. **Effect of film thickness on the electrical transport in $Co_2FeAl_{0.5}Si_{0.5}$ thin films.** *L.A. Longchar*[1], M. Rahaman[1], B.K. Hazra[1], M. Raja[2], R. Rawat[3], S. Srinath[1] and S. Kaul[1] *1. School of Physics, University of Hyderabad, Hyderabad, India; 2. Defence Metallurgical Research Laboratory, Hyderabad, India; 3. UGC-DAE Consortium for Scientific Research, Indore, India*

BPA-02. **Withdrawn**

BPA-03. **Investigation of Spin Gapless Semiconductor CoFeMnSi Thin Films on MgO Substrate.** *J. Wang*[1], T. Nakano[1], M. Tsunoda[2] and M. Oogane[1] *1. Applied Physics, Tohoku, Sendai, Japan; 2. Electrical Engineering, Tohoku, Sendai, Japan*

BPA-04. **Structural and Magnetic Properties of $Co_{1.5}Mo_{0.5}FeAl$ Alloy.** *G. Baker*[1], J. Wysong[1], S. Valloppilly[2], P. Shand[3], P. Lukashev[3] and P. Kharel[1] *1. Physics, South Dakota State Unviersity, Brookings, SD, United States; 2. Nebraska Center for Materials and Nanoscience, University of Nebraska Lincoln, Lincoln, NE, United States; 3. Physics, University of Northern Iowa, Cedar Falls, IA, United States*

BPA-05. **Effect of substitution of 3d, 4d and 5d elements on structural, electronic, magnetic properties and XMCD spectra of Co-based Full Heusler alloys: A DFT Study.** *R. Dutt*[1,2] and A. Chakrabarti[2,1] *1. Physical Sciences, Homi Bhabha National Institute, Mumbai, India; 2. Raja Ramanna Centre of Advanced Technology, Indore, India*

BPA-06. **Anomalous Hall Effect and Anisotropic Magnetoresistance Effect in $Co_2(Ti_{1-x}V_x)Si$ Heusler Alloy Single Crystal Films.** *M. Liu*[1], M. Oogane[1], M. Tsunoda[1] and Y. Ando[1] *1. Tohoku University, Sendai, Japan*

BPA-07. **Hall Coefficient of $(Cr_{100-x}Al_x)_{95}Mo_5$ Alloy System.** *B. Muchono*[1,2], C.J. Sheppard[1] and A.R. Prinsloo[1] *1. Department of Physics, University of Johannesburg, Johannesburg, South Africa; 2. Department of Physics, University of Eswatini, Kwaluseni, Swaziland*

BPA-08. **Enhanced multiferroic properties in $Bi_{0.9}H_{0.1}FeO_3$ polycrystalline films (H = heavy rare earth elements).** *T. Lin*[1], H.W. Chang[2], W. Chou[3], C. Hung[3], C. Wang[3] and D. Wei[1] *1. Institute of Manufacturing Technology and Department of Mechanical Engineering, National Taipei University of Technology, Taipei, Taiwan; 2. Physics, National Chung Cheng University, Chia-Yi, Taiwan; 3. Applied Physics, Tunghai University, Taichung, Taiwan*

BPA-09. **Ab-initio study of Chromia (Cr_2O_3): Calculation of Hubbard U parameter.** *S. Sharma*[2,1], R. Mahajan[1], A. Shah[1] and A. Kashyap[1] *1. School of Basic Sciences, IIT Mandi, Mandi, India; 2. School of Physical Sciences, National Institute of Science Education and Research, Bhubaneswar, India*

BPA-10. **Tuning of Magnetic and Electrical properties of Samarium Iron Garnet by Holmium Substitution.** *S. Verma*[1] and S. Ravi[1] *1. Physics, Indian Institute of Technology, Guwahati, Guwahati, India*

BPA-11. **Strain-independent Regulation of Magnetic Properties by Topotactic Phase Transformation in $LaCoO_3$ Thin Films.** *Y. Fan*[1,2], Z. Yin[1], J. Wang[1], F. Hu[1], B. Li[2], A. Geng[2] and B. Shen[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Beijing Technology and Business University, Beijing, China*

BPA-12. **On the synthesis and characterization of bimagnetic CoO/$NiFe_2O_4$ heterostructured nanoparticles.** *M. Uddin*[1], R. Mayanovic[1] and M. Benamara[2] *1. Physics, Astronomy & Materials Science, Missouri State University, Springfield, MO, United States; 2. Materials Science & Engineering, University of Arkansas, Fayetteville, AR, United States*

BPA-13. **Investigations of Size-Dependent Properties of Mn-Co-NiO Based Heterostructured Nanoparticles.** *F. Ishrak*[1], R. Mayanovic[1] and M. Benamara[2] *1. Physice, Astronomy, and Materials Science, Missouri State University, Springfield, MO, United States; 2. University of Arkansas, Fayetteville, AR, United States*

BPA-14. **Exchange bias and gate-tunable magnetic anisotropy in 2D multiferroic heterostructure.** *Y. Ma*[1] *1. King Abdullah University of Science and Technology, Jeddah, Saudi Arabia*

BPA-15. **Photo-Induced Paramagnetic States of Methyl Radicals Adsorbed at ZnO Nanoparticles Surface.** *D. Marin*[1], A. Savoyant[1], S. Bertaina[1] and O. Margeat[2] *1. IM2NP, Marseille, France; 2. CINAM, Marseille, France*

BPA-16. **Effect of microwave instant heating on magnetic, electric, thermoelectric and microwave absorption properties of $La_{0.7}Na_{0.3}MnO_3$.** M. Marimuthu[1], L. Jiang[1], G. Chen[1], *Y. Lee*[1], A. Ghosh[1] and R. Mahendiran[1] *1. National University of Singapore, Singapore, Singapore*

BPA-17. **Magnetic Field-dependent Thermal Conductivity in $(La_{0.6}Pr_{0.4})_{0.7}Ca_{0.3}MnO_3$ Thin Films.** *V. Bruchmann-Bamberg*[1], K. Stroh[1], P. Henning[1], D. Steil[1] and V. Moshnyaga[1] *1. Physikalisches Institut, Georg-August-Universitaet Goettingen, Goettingen, Germany*

Session COA
MAGNETO-IONICS
Enric Menendez, Chair
Autonomous University of Barcelona, Cerdanyola del Vallès, Spain

COA-01. **Voltage Control of Skyrmions Using Solid-State Lithium-Ion Gating.** *M. Ameziane*[1], R. Mansell[1] and S. van Dijken[1] *1. Applied Physics, Aalto University, Espoo, Finland*

COA-02. **Withdrawn**

COA-03. **On-Off Ferromagnetism in Co_3O_4 by Voltage-Driven Oxygen Ion Migration.** *E. Menendez*[1], S. Martins[1], J. de Rojas[1], A. Quintana[2], Z. Tan[1], J.L. Costa-Krämer[3] and J. Sort[1,4] *1. Physics, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Spain; 2. Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Cerdanyola del Vallès, Spain; 3. IMN-Instituto de Micro y Nanotecnología (CNM-CSIC), Tres Cantos (Madrid), Spain; 4. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain*

COA-04. **Stability of under/over oxidized magneto-ionic states in $Pt/Co_{60}Fe_{20}B_{20}/HfO_2$.** *R. Pachat*[1], D. Ourdani[2], M. Syskaki[3], T. Bhatnagar-Schoeffmann[1], M. Massouras[1], S. Roy[1], A. Lamperti[4], Y. Roussigné[2], S. Ono[5], J. Langer[3], D. Ravelosona[1,6], M. Belmeguenai[2] and L. Herrera Diez[1] *1. C2N, Université Paris-Saclay, Palaiseau, France; 2. LSPM, Université Sorbonne Paris Nord, Villetaneuse, France; 3. Singulus Technologies AG, Kahl am Main, Germany; 4. IMM-CNR, Agrate Brianza, Italy; 5. Central Research Institute of Electric Power Industry, Yokosuka, Japan; 6. Spin-Ion Technologies, Palaiseau, France*

COA-05. **Magneto-ionic tuning of magnetic states in $Ni_{80}Fe_{20}$ nanodot arrays.** *S. Honnali*[1,2], M. Kutuzau[1,3], K. Nielsch[1,2], H. Reith[1] and K. Leistner[1,3] *1. IFW Dresden, Dresden, Germany; 2. Institute of Material Science, TU Dresden, Dresden, Germany; 3. Electrochemical Sensors and Energy Storage, Institute of Chemistry, Faculty of Natural Sciences, TU Chemnitz, Chemnitz, Germany*

COA-06. **Magneto-Ionic Switching of Superparamagnetism.** ***(Invited)*** *M. Gößler*[1,2], S. Topolovec[2], H. Krenn[3] and R. Würschum[2] *1. Institute of Chemistry, Chemnitz University of Technology, Chemnitz, Germany; 2. Institute of Materials Physics, Graz University of Technology, Graz, Austria; 3. Institute of Physics, University of Graz, Graz, Austria*

COA-07. **Influence of alkaline electrolyte composition on H-based magneto-ionic effect in Ni films.** *M. Kutuzau*[1,2], M. Gößler[1,3], S. Topolovec[3], S. Schiemenz[2], K. Nielsch[2,4] and K. Leistner[1,2] *1. Electrochemical Sensors and Energy Storage, Chemnitz University of Technology, Chemnitz, Germany; 2. Leibniz IFW Dresden, Dresden, Germany; 3. Institute of Materials Physics, Graz University of Technology, Graz, Austria; 4. Institute of Material Science, TU Dresden, Dresden, Germany*

COA-08. **Boosting nitrogen magneto-ionics: From binary to ternary transition metal nitrides.** *Z. Tan*[1], J. de Rojas[1], A. Quintana[4], J.L. Costa-Krämer[3], E. Menendez[1] and J. Sort[1,2] *1. Departament de Física, Universitat Autònoma de Barcelona, Barcelona, Spain; 2. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain; 3. IMN-Instituto de Micro y Nanotecnología (CNM-CSIC), Madrid, Spain; 4. Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Barcelona, Spain*

COA-09. **Magneto-ionic and electrostatic generation of non-volatile and volatile skyrmions in MgO/Mn_2CoAl/Pd thin films using ionic liquid gating.** Y. Zhang[1,2], G. Dubuis[3], C. Doyle[4], T. Butler[1,2] and *S. Granville*[1,2] *1. Robinson Research Institute, Victoria University of Wellington, Wellington, New Zealand; 2. MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand; 3. Measurement Standards Laboratory of New Zealand, Callaghan Innovation, Lower Hutt, New Zealand; 4. Department of Chemical and Materials Engineering, The University of Auckland, Auckland, New Zealand*

COA-10. **Non-volatile Voltage Control of Perpendicular Exchange Bias by Resistive Switching in the Co/NiO/HfO_2 Gate Device.** *T. Hsin*[1], Y. Lin[1], N. Dai[1] and Y. Tseng[1] *1. National Yang Ming Chiao Tung University, Hsinchu, Taiwan*

COA-11. **Ultimately Tunable Magnetic Materials: The Rare Earth Nitrides.** *W.F. Holmes-Hewett*[1], J. Miller[1], C. Pot[1], B. Buckley[1], B. Ruck[1] and J. Trodahl[1] *1. Victoria University of Wellington, Wellington, New Zealand*

ORAL SESSIONS

Session COB

TOPOLOGICAL INSULATORS, DIRAC MATERIALS, 2D AND LAYERED VAN DER WAALS MATERIALS I

Marco Gobbi, Chair

CIC nanoGUNE, San Sebastian, Spain

COB-01. **Magnetic Skyrmions and Exchange Bias in van der Waals Heterostructures.** ***(Invited)*** *Y. Wu*[1], K. Liu[2], K. Wang[3] and J. Moodera[1] *1. Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Georgetown University, Georgetown, WA, United States; 3. University of California Los Angeles, Los Angeles, CA, United States*

COB-02. **Large Dzyaloshinskii-Moriya interaction at the h-BN/ Cobalt interface.** *B. El-Kerdi*[1], A. Thiaville[1], S. Rohart[1], S.K. Panigrahy[1], N. Brás[1], J. Sampaio[1] and A. Mougin[1] *1. Laboratoire de Physique des Solides, Université Paris-Saclay, CNRS, Orsay, France*

COB-03. **Asymmetric Magnetic Proximity Interactions in Ferromagnet/Semiconductor van der Waals Heterostructures.** *S. Crooker*[1], J. Choi[1], C. Lane[1] and J. Zhu[1] *1. Los Alamos National Lab, Los Alamos, NM, United States*

COB-04. **Spin-sensitive Epitaxial In_2Se_3 Tunnel Barrier in In_2Se_3/ Bi_2Se_3 Topological Van der Waals Heterostructure.** *C.H. Li*[1], J. Moon[1], O. Van't Erve[1], D. Wickramaratne[1], E. Cobas[1], M. Johannes[1] and B.T. Jonker[1] *1. Naval Research Lab, Washington, DC, United States*

COB-05. **Topological Antiferromagnetic Interface in Sputtered Topological Insulator/Ferromagnet Heterostructures. *(Invited)*** N. Bhattacharjee[1], K. Mahalingam[2], A. Fedorko[1], V. Lauter[3], M. Matzelle[1], B. Singh[4], A.J. Grutter[5], A.R. Will-Cole[1], M. Page[2], R. Markiewicz[1], A. Bansil[1], J. Hart[6], A. Podpirka[7], S. Patel[8], S.H. Tolbert[8], J.J. Cha[6], D. Heiman[1] and *N. Sun*[1] *1. Northeastern University, Boston, MA, United States; 2. Air Force Research Laboratory, Hamilton, OH, United States; 3. Oak Ridge National Laboratory, Oak Ridge, TN, United States; 4. Tata Institute of Fundamental Research, Mumbai, India; 5. National Institute of Technology, Gaithersburg, MD, United States; 6. Cornell University, Ithaca, NY, United States; 7. Johns Hopkins Applied Physics Laboratory, Laurel, MD, United States; 8. University of California Los Angeles, Los Angeles, CA, United States*

COB-06. **Ultralow power nanosecond spin orbit torque magnetization switching induced by BiSb topological insulator.** *N.H. Khang*[1,2], T. Shirokura[1], F. Tuo[1], M. Takahashi[4], N. Nakatani[4], D. Kato[4], Y. Miyamoto[4] and P. Nam Hai[1,3] *1. Electrical and Electronic Engineering, Tokyo Institute of Technology, Tokyo, Japan; 2. Department of Physics, Ho Chi Minh University of Education, Ho Chi Minh, Vietnam; 3. University of Tokyo, Tokyo, Japan; 4. Science & Technology Research Labs, NHK, Tokyo, Japan*

COB-07. **Gate-tunable anomalous Hall effect in a 3D topological insulator/2D magnet van der Waals heterostructure.** *R. Jain*[1], V. Gupta[1], Y. Ren[2], X. Zhang[1], H. Alnaser[3], A. Vashist[3], V. Deshpande[3], D. Muller[1], D. Xiao[2], T. Sparks[3] and D.C. Ralph[1] *1. Cornell University, Ithaca, NY, United States; 2. University of Washington, Seattle, WA, United States; 3. University of Utah, Salt Lake City, UT, United States*

COB-08. **Proximity Enhanced Anomalous Hall Transport in Biphase Iron Oxide/Tungsten Disulfide Heterostructures.** *C. Hung*[1], T. Diem[1], A. Chanda[1], D. Detellem[1], N. Alzahrani[1], N.A. Kapuruge[1], Y.T. Pham[1], M. Liu[2], D. Zhou[2], H. Gutierrez[1], D. Arena[1], M. Terrones[2], S. Witanachchi[1], L. Woods[1], H. Srikanth[1] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Materials Research Institute, Pennsylvania State University, Pennsylvania, PA, United States*

COB-09. **Role of Spin-resolved Anti-bonding States Filling in Enhanced HER Performance of Monolayer WSe_2 by Transition Metals Doping.** *L. Guo*[1] and W. Mi[1]
1. Department of Applied Physics, Tianjin University, Tianjin, China

ORAL SESSIONS

Session COC

TOPOLOGICAL INSULATORS, DIRAC MATERIALS, 2D AND LAYERED VAN DER WAALS MATERIALS II

Shinobu Ohya, Chair
The University of Tokyo, Tokyo, Japan

COC-01. **Electrical and Optical Control of 2D Magnets.** ***(Invited)*** *C. Gong*[1] *1. Electrical and Computer Engineering, University of Maryland, College Park, College Park, MD, United States*

COC-02. **Withdrawn**

COC-03. **Light-mediated magnetism in van der Waals magnetic heterostructures.** *V. Ortiz Jimenez*[1], Y.T. Pham[1], N.W. Mudiyanselage[1], M. Liu[2], F. Zhang[2], M. Terrones[2] and M. Phan[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Material Science and Engineering, The Pennsylvania State University, University Park, PA, United States*

COC-04. **Withdrawn**

COC-05. **Enhanced Ferromagnetism in Artificially Stretched Quasi Two-Dimensional $Cr_2Ge_2Te_6$.** *H. Idzuchi*[1,2], A.E. Llacsahuanga Allcca[3], A. Lu[4], M. Saito[1], K. Inoue[2], Y. Ikuhara[1,2], T. Nakanishi[4] and Y. Chen[3,2] *1. The University of Tokyo, Tokyo, Japan; 2. Tohoku University, Sendai, Japan; 3. Purdue University, West Lafayette, IN, United States; 4. National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

COC-06. **Influence of the surface states on the nonlinear Hall effect in Weyl semimetals.** *D. García Ovalle*[1], A. Pezo[1] and A. Manchon[1] *1. Aix-Marseille Université, Marseille, France*

COC-07. **All-electric measurement of perpendicularly spin polarization in Weyl semimetal, WTe_2, at room temperature.** *K. Ohnishi*[1], M. Aoki[1], E. Shigematsu[1], R. Ohshima[1], Y. Ando[1,2], T. Takenobu[3] and M. Shiraishi[1] *1. Electronic Science and Engineering, Kyoto Univ., Kyoto city, Japan; 2. PRESTO, JST, Honcho, Kawaguchi, Japan; 3. Applied Physics, Nagoya Univ., Nagoya, Japan*

COC-08. **Room temperature bilinear magnetoelectric resistance in sputtered Dirac semimetal Pt_3Sn.** *Y. Fan*[1], Y. Yang[1], Z. Cresswell[2], Y. Lv[1], T. Peterson[3], D. Zhang[1], J. Liu[1] and J. Wang[1] *1. Electrical Engineering, University of Minnesota, Minneapolis, MN, United States; 2. School of Chemical Engineering & Materials Science, University of Minnesota, Minneapolis, MN, United States; 3. Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States*

COC-09. **Layered $FeGe_2$ Films on GaAs(001) Substrates.** *J. Herfort*[1], M. Terker[1], A. Trampert[1], M. Hanke[1], P. Ibanez[1] and M. Ramsteiner[1] *1. Paul-Drude-Institute for Solid State Electronics, Berlin, Germany*

COC-10. **Behavior of Bubble Lattices in Cr2Ge2Te6.** *A.R. McCray*[1,2], Y. Li[1], E. Qian[3], W. Wang[4], X. Ma[4], D. Chung[1], Y. Liu[4], M.G. Kanatzidis[3], A. Petford-Long[1,5] and C. Phatak[1,5] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Applied Physics Program, Northwestern University, Evanston, IL, United States; 3. Department of Chemistry, Northwestern University, Evanston, IL, United States; 4. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 5. Department of Materials Science and Engineering, Northwestern University, Evanston, IL, United States*

COC-11. **Identifying Axion Insulator by Quantized Magnetoelectric Effect in Antiferromagnetic $MnBi_2Te_4$ Tunnel Junction.** *Y. Li*[1] and R. Cheng[1] *1. UC, Riverside, Riverside, CA, United States*

POSTER SESSIONS

Session CPA
MAGNETOELECTRONIC MATERIALS AND PHENOMENA (Poster Session)

Markus Gößler, Chair
Chemnitz University of Technology, Chemnitz, Germany

CPA-01. **Phase Coexistence and Strain-mediated Magnetic Anisotropy in Magnetic Weyl Semimetal Co_2MnGa Films.** *N. Schulz*[1], A. Chanda[1], J.D. Gayles[1], A. Markou[2], C. Felser[2], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Solid State Chemistry, Max-Planck-Institute for Chemical Physics of Solids, Dresden, Germany*

CPA-02. **Theory of Inverse Faraday effect in massive Dirac electrons.** *G. Qu*[1] and G. Tatara[1] *1. Center for Emergent Matter Science, RIKEN, Wako-Shi, Japan*

CPA-03. **Exchange/Zeeman Competition in the Rare-Earth Nitrides and the Resulting Magnetic Compensation.** *J. Miller*[1,2], B. Ruck[1,2] and J. Trodahl[2] *1. MacDiarmid Institute, Wellington, New Zealand; 2. Victoria University, Wellington, New Zealand*

CPA-04. **Unexpected opposite dependencies of anisotropy field and strength of spin-orbit interaction on gate voltage measured in FeCoB nanomagnet.** *V. Zayets*[1], I. Serdeha[2] and V. Grygoruk[2] *1. Platform Photonics Research Center, AIST, Tsukuba, Japan; 2. Educational and Scientific Institute of High Technologies, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

CPA-05. **Electric field control of magnetization reversal in FeGa/PMN-PT.** *G. Pradhan*[1], F. Celegato[1], L. Mikuličková[2], A. Magni[1], G. Barrera[1], M. Coisson[1] and P. Tiberto[1] *1. Istituto Nazionale di Ricerca Metrologica, Torino, Italy; 2. Thin film Technological Service, s.r.o., Prague, Czechia*

CPA-06. **Improving Voltage-driven ON-OFF Ferromagnetism in Cobalt Oxide via Electrolyte Engineering.** *Z. Ma*[1], S. Martins[1], E. Pellicer[1], E. Menendez[1] and J. Sort[1,2] *1. Departament de Física, Universitat Autònoma de Barcelona, Barcelona, Spain; 2. Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain*

CPA-07. **Switching of Magnetic Anisotropy in MgO/CoFeB/W stack by Ionic Liquid Gating for Voltage Tuneable Magneto Resistive Sensor.** *A. Islam*[1,2], S. Granville[1,2] and S. Acharya[1,2] *1. Robinson Research Institute, Victoria University of Wellington, Wellington, New Zealand; 2. MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*

ORAL SESSIONS

Session DOA

MAGNETORESISTANCE IN HETEROSTRUCTURES (GMR, TMR, TAMR)

William Echtenkamp, Co-Chair
University of Minnesota, Minneapolis, MN, United States
Simon Granville, Co-Chair
Victoria University of Wellington, Lower Hutt, New Zealand

DOA-01. **Brain-Inspired Computing by Chaotic Spin-Torque Oscillator.** ***(Invited)*** *T. Taniguchi*[1], S. Tsunegi[1], T. Yamaguchi[2], A. Kamimaki[5], N. Akashi[3], T. Kubota[4], K. Nakajima[4], H. Notsu[6], M. Kimura[6], H. Tsukahara[7], J. Grollier[8], V. Cros[8], K. Yakushiji[1], A. Fukushima[1], S. Yuasa[1] and H. Kubota[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. RIKEN, Wako, Japan; 3. Kyoto University, Sakyo-ku, Japan; 4. The University of Tokyo, Bunkyo-ku, Japan; 5. Yokohama National University, Yokohama, Japan; 6. Kanazawa University, Kanazawa, Japan; 7. Osaka University, Osaka, Japan; 8. CNRS/Thales, Palaiseau, France*

DOA-02. **Large unidirectional spin Hall and Rashba–Edelstein magnetoresistance in topological insulator/magnetic insulator heterostructures.** *Y. Lv*[1], J. Kally[2], T. Liu[3], P. Quarterman[4], T. Pillsbury[2], B. Kirby[4], A.J. Grutter[4], P. Sahu[5], J.A. Borchers[4], M. Wu[3], N. Samarth[2] and J. Wang[1,5] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Department of Physics, The Pennsylvania State University, University Park, PA, United States; 3. Department of Physics, Colorado State University, Fort Collins, CO, United States; 4. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 5. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States*

DOA-03. **Controlling spin-valve effects in ferromagnet/superconductor structures via the ratio of orbital to spin moments.** S. Wang[2], *K. Dumesnil*[1,2], H. Bradshaw[2], N. Stelmashenko[2] and J. Robinson[2] *1. IJL, Nancy, France; 2. Department of Metallurgy and Materials Science, University of Cambridge, Cambridge, United Kingdom*

DOA-04. **Giant voltage-controllable magnetoresistance switching in Ge short-channel devices with epitaxial ultra-thin Fe electrodes.** *S. Tsuruoka*[1], Y. Tadano[1], L.D. Ahn[1,2], M. Tanaka[1,2] and S. Ohya[1,2] *1. Department of Electrical Engineering and Information Systems, The University of Tokyo, Bunkyo-ku, Japan; 2. Center for Spintronics Research Network, Graduate School of Engineering, The University of Tokyo, Bunkyo-ku, Japan*

DOA-05. **Damping constant of Co_2FeAl thin film deposited by molecular beam epitaxy and tunnel magnetoresistance effect using them.** *T. Hojo*[1], N. Tezuka[2], T. Nakano[1], M. Tsunoda[3,5] and M. Oogane[1,4] *1. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Department of Metallurgy, Materials Science and Materials Processing, Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. Department of Electronic Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan; 4. Center for Science and Innovation in Spintronics (Core Research Cluster) Organization for Advanced Studies, Tohoku University, Sendai, Japan; 5. Center for Spintronics Research Network, Tohoku University, Sendai, Japan*

DOA-06. **Heusler Alloy Based Perpendicular Magnetic Tunnel Junctions.** *S. Acharya*[1,2], A. Islam[1,2] and S. Granville[1,2] *1. Robinson Research Institute, Victoria University of Wellington, Lower Hutt, Wellington, New Zealand; 2. MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*

DOA-07. **Investigation of electronic structure of FeAlSi epitaxial films with soft magnetic property for MTJ based-sensor applications.** *S. Akamatsu*[1], T. Nakano[1], M. Al-Mahdawi[1,2], M. Tsunoda[2,3], Y. Ando[1,2] and M. Oogane[1,2] *1. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Department of Electronic Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan*

DOA-08. **Spin filtering effects at graphene/molecules interfaces.** *C. Barraud*[1], L. Chen[3,1], B. Dlubak[4], A. Droghetti[2], M. Martin[4], P. Martin[3], R. Mattana[4] and P. Seneor[4] *1. Physics, Université Paris Cité, Paris, France; 2. School of Physics and CRANN, Trinity College, Dublin, Ireland; 3. Chemistry, Université Paris Cité, Paris, France; 4. Unité Mixte de Physique CNRS/Thales, Palaiseau, France*

DOA-09. **Angle-Dependent Switching in a Magnetic Tunnel Junction Containing a Synthetic Antiferromagnet.** *H. Chen*[1], B. Parks[2,1], Q. Zhang[3,4], B. Fang[3], X. Zhang[3] and S. Majetich[1] *1. Physics, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Intel Ronler Acres, Hillsboro, OR, United States; 3. King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 4. New York University Abu Dhabi, Abu Dhabi, United Arab Emirates*

DOA-10. **Quantum control of spin qubit ensembles with nanomagnets: Exchange coupling for high fidelity.** *M.F. Chowdhury*[1], M. Niknam[2], M. Rajib[1], W. Misba[1], R.N. Schwartz[2], K. Wang[2], L. Bouchard[2] and J. Atulasimha[1] *1. Virginia Commonwealth University, Richmond, VA, United States; 2. University of California Los Angeles, Los Angeles, CA, United States*

DOA-11. **Extraordinary Tunnel Electroresistance in Layer-by-Layer Engineered van der Waals Ferroelectric Tunnel Junctions.** *Q. Wang*[1], T. Xie[1], Z. Song[1] and C. Gong[1] *1. University of Maryland, College Park, MD, United States*

ORAL SESSIONS

Session DOB
MRAM, MAGNETIC LOGIC AND RELATED DEVICES

Christopher Safranski, Co-Chair
IBM, Yorktown Heights, NY, United States
Reinoud Lavrijsen, Co-Chair
Eindhoven University of Technology, Eindhoven, Netherlands

DOB-01. **Ultrafast racetrack based on compensated Co/Gd-based synthetic ferrimagnet with all-optical switching.** ***(Invited)*** *R. Lavrijsen*[1], P. Li[1], T. Kools[1] and B. Koopmans[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

DOB-02. **Picosecond Optospintronic Tunnel Junctions for Non-volatile Photonic Memories.** *L. Wang*[1], W. Zhao[2], M. Heck[1] and B. Koopmans[1] *1. Eindhoven Hendrik Casimir Institute, Center for Photonic Integration, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Fert Beijing Institute, MIIT Key Laboratory of Spintronics, Beihang University, Beijing, China*

DOB-03. **Fast Current Induced Domain Wall Motion in Compensated GdFeCo Nanowire.** *S. Ranjbar*[1], S. Sumi[1], K. Tanabe[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

DOB-04. **Field Free Switching in Spin-Orbit Torque Memories with Spin Current Gradient.** *V. Kateel*[1,2], V. Krizakova[3], M.G. Monteiro[1,2], F. Yasin[1], K. Cai[1], B. Soree[1], J. De Boeck[1], P. Gambardella[3], S. Rao[1], S. Couet[1], G. Shankar[1] and K. Garello[4] *1. IMEC, Leuven, Belgium; 2. Department of Electrical Engineering (ESAT), KU Leuven, Leuven, Belgium; 3. Department of Materials, ETH Zurich, Zurich, Switzerland; 4. Spintec, Grenoble, France*

DOB-05. **Evidence for Domain Wall Reversal in very Small Perpendicular MRAM Cells.** *H. Richter*[1], G. Mihajlovic[1], N. Melendez[1], M. Grobis[1] and T. Santos[1] *1. Research, Western Digital, San Jose, CA, United States*

DOB-06. **Enhancing write margin of perpendicular MRAM cells using thick MgO cap layer.** *G. Mihajlovic*[1], T. Santos[1], J. Li[1] and M. Grobis[1] *1. San Jose Research Center, Western Digital Corporation, San Jose, CA, United States*

DOB-07. **Thermal Variation of Thermal Stability Factor and Switching Efficiency of STT-MRAM Devices.** *S. Mangadahalli Siddaramu*[1], M. Hindenberg[1], M. Wagner Reetz[1], J. Müller[2] and J. Chatterjee[1] *1. Fraunhofer Institute for Photonic Microsystems, CNT, An der Bartlake 5, 01109 Dresden, Germany; 2. GlobalFoundries Fab1 LLC and Company KG, 01109 Dresden, Germany*

DOB-08. **Control of Interface Anisotropy for Spin Transfer Torque in Perpendicular Magnetic Tunnel Junctions for Cryogenic Temperature Operation.** *P. Brandao Veiga*[1], A. Mora-Hernandez[1], M. Dammak[1], L.D. Buda-Prejbeanu[1], L. Prejbeanu[1], L. Vila[1], S. Auffret[1], R. Sousa[1] and B. Dieny[1] *1. IRIG-SPINTEC, Grenoble Alpes Univ., CNRS, CEA, Grenoble INP, Grenoble, France*

DOB-09. **Reliable Sub-nanosecond MRAM with Double Spin-torque Magnetic Tunnel Junctions.** *C. Safranski*[1], G. Hu[1], J.Z. Sun[1], P. Hashemi[1], S. Brown[1], L. Buzi[1], C. D'Emic[1], E. Edwards[1], E. Galligan[1], M. Gotwald[1], O. Gunawan[1], S. Karimeddiny[1], H. Jung[1], J. Kim[1], K. Latzko[1], P. Trouilloud[1] and D. Worledge[1] *1. IBM-Samsung MRAM Alliance, IBM TJ Watson Research Center, Yorktown Heights, NY, United States*

DOB-10. **Switching optimization in magnetoresistive random access memories.** *Z. Lin*[1], I. Volvach[1] and V. Lomakin[1] *1. University of California, San Diego, San Diego, CA, United States*

DOB-11. **Spintronic Physical Unclonable Functions in an Exchange-biased Trilayer Structure.** *J. Kang*[1], S. Lee[1], T. Lee[1], M. Kang[1], J. Lee[2], S. Noh[2], H. Lee[2], J. Kwon[2], K. Kim[1] and B. Park[1] *1. Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. R&D Division, Hyundai Motor Company, Hwaseong, The Republic of Korea*

DOB-12. **Machine intelligence in new materials identification for efficient spin-orbit torque (SOT) MRAM.** *S. Sayed*[1,2], H. Kleidermacher[1], G. Hashemi-Asasi[1], C. Hsu[1] and S. Salahuddin[1] *1. Electrical Engineering and Computer Sciences, University of California Berkeley, Berkeley, CA, United States; 2. TDK Headway Technologies, Milpitas, CA, United States*

DOB-13. **Time-domain Computing for Boolean Logic using STT-MRAM.** *R. Zhou*[1] and H. Cai[1] *1. Southeast University, Nanjing, China*

DOB-14. **Design of Domain Wall-Magnetic Tunnel Junction Analog Content Addressable Memory using Current and Projected Prototype Data.** *H. Jin*[1], H. Zhu[1], K. Zhu[1], T. Leonard[1], M. Alamdar[1], D. Pan[1] and J.C. Incorvia[1] *1. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States*

DOB-15. **Strain-Modulated Magnetic Anisotropy for Physically Secure Logic Locking.** *A.J. Edwards*[1], N. Hassan[1], D. Bhattacharya[2], M.M. Shihab[1], P. Zhou[1], X. Hu[1], J. Atulasimha[3], Y. Makris[1] and J.S. Friedman[1] *1. Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Physics, Georgetown University, Georgetown, DC, United States; 3. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*

DOB-16. **All-electrical Manipulation of Multiple Resistant States via Modifying Magnetic Anisotropy for Emulating Synaptic Memory.** *T. Jin*[1], F. Tan[1], H. Poh[1], S. Lee[1], S. Wu[1], G. Lim[1] and W. Lew[1] *1. Nanyang Technological University, Singapore, Singapore*

ORAL SESSIONS

Session DOC
NEUROMORPHIC COMPUTING

Joseph Friedman, Chair
The University of Texas at Dallas, Richardson, TX, United States

DOC-01. **Binarized Neuromorphic Inference Network with STT MTJ Synapses.** *P. Zhou*[1], A.J. Edwards[1], F. Mancoff[2], S. Aggarwal[2] and J.S. Friedman[1] *1. Department of Electrical and Computer Engineering, The University of Texas at Dallas, Richardson, TX, United States; 2. Everspin Technologies, Inc., Chandler, AZ, United States*

DOC-02. **Optimized fabrication of memristor-controlled spin Hall nano-oscillators.** *J. Åkerman*[1], A. Kumar[1], M. Rajabali[1], V.H. González[1], M. Zahedinejad[1] and A. Houshang[1] *1. Department of Physics, University of Gothenburg, Gothenburg, Sweden*

DOC-03. **Building spintronics neuromorphic systems with Neural Ordinary Differential Equations.** *X. Chen*[1*], F. Abreu Araujo[2], M. Riou[3], J. Torrejon[3], D. Ravelosona[1], W. Kang[4], W. Zhao[4], J. Grollier[3] and D. Querlioz[1] *1. Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, Palaiseau, France; 2. Institute of Condensed Matter and Nanosciences, Université Catholique de Louvain, Place Croix du Sud 1, Louvain-la-Neuve, Louvain-la-Neuve, Belgium; 3. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 4. Beihang University, Beijing, China*

DOC-04. **Stochastic Magnetic Actuated Random Transducer Devices based on Perpendicular Magnetic Tunnel Junctions.** *L. Rehm*[1], C.C. Capriata[1,2], S. Misra[3], J. Smith[3], M. Pinarbasi[4], B.G. Malm[2] and A.D. Kent[1] *1. Center for Quantum Phenomena, Department of Physics, New York University, New York, NY, United States; 2. Division of Electronics and Embedded Systems, KTH Royal Institute of Technology, Stockholm, Sweden; 3. Sandia National Laboratories, Albuquerque, NM, United States; 4. Spin Memory Inc., Fremont, CA, United States*

DOC-05. **Implementing stochastic noise using voltage-controlled magnetic tunnel junctions.** *J. Kwon*[1], S. Liu[1], S.G. Cardwell[3], C.D. Schuman[2], J. Smith[3], S. Misra[3], J.B. Aimone[3] and J. Incorvia[1] *1. Electrical and Computer Engineering, University of Texas at Austin, Austin, TX, United States; 2. Electrical Engineering and Computer Science, University of Tennessee, Knoxville, TN, United States; 3. Sandia National Laboratories, Albuquerque, NM, United States*

DOC-06. **Hardware-Aware Bayesian Variational Inference Using Magnetic Tunnel Junction Noise Distributions in Artificial Synapse Arrays.** *S. Liu*[1], T.P. Xiao[2], J. Kwon[1], B. Debusschere[2], S. Agarwal[2], J. Incorvia[1] and C. Bennett[2] *1. The University of Texas at Austin, Austin, TX, United States; 2. Sandia National Laboratories, Albuquerque, NM, United States*

DOC-07. **Classification Using Stochastic Neural Networks Based On Domain Wall Pinning.** *M.O. Ellis*[1], A. Welbourne[2], S. Kyle[2], D. Allwood[2], T. Hayward[2] and E. Vasilaki[1] *1. Department of Computer Science, University of Sheffield, Sheffield, United Kingdom; 2. Department of Materials Science, University of Sheffield, Sheffield, United Kingdom*

DOC-08. **Echo State Property in Vortex Spin Torque Oscillator.** *Y. Imai*[1], S. Tsunegi[1], K. Nakajima[2] and T. Taniguchi[1] *1. National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; 2. The University of Tokyo, Bunkyo-ku, Japan*

DOC-09. **Brownian Reservoir Computing Realized Using Geometrically Confined Skyrmions.** *K. Raab*[1], M.A. Brems[1], G. Beneke[1], T. Dohi[1], J. Rothörl[1], F. Kammerbauer[1], J.H. Mentink[2] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg University Mainz, Mainz, Germany; 2. Institute for Molecules and Materials, Radboud University, Nijmegen, Netherlands*

DOC-10. **Demonstration of basic operations using skyrmions in multilayers i.e. full-electrical nucleation, motion and detection for neuromorphic devices.** *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 de Physique CNRS, Palaiseau, France; 2. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay, Palaiseau, France*

DOC-11. **Memristive Spin-Orbit Torque Switching in Nanocomposite CoPtCrB.** *V. De Zoysa K.*[1], S. DuttaGupta[2], B. Jinnai[3], H. Ohno[1] and S. Fukami[1] *1. Lab. for Nanoelectronics and Spintronics, RIEC, Tohoku Univ., Sendai, Japan; 2. CSIS (Core Research Cluster), Tohoku Univ., Sendai, Japan; 3. WPI-AIMR, Tohoku Univ., Sendai, Japan*

DOC-12. **Fully-Parallel Convolution with Chains of Spin-Diodes.** *E. Plouet*[1,2], D. Sanz Hernandez[1,2], P. Sethi[1,2], N. Leroux[1,2], B. Dlubak[1,2], V. Zatko[1,2], A. Mizrahi[1,2] and J. Grollier[1,2] *1. Unité Mixte de Physique CNRS Thales, Palaiseau, France; 2. Université Paris-Saclay, Palaiseau, France*

DOC-13. **Thermal and Edge Roughness Effects on Domain Wall Based Reservoir Computing.** R. Ababei[2], *M.O. Ellis*[1], I.T. Vidamour[2], D. Devadesan[2], D. Allwood[2], E. Vasilaki[1] and T. Hayward[2] *1. Department of Computer Science, University of Sheffield, Sheffield, United Kingdom; 2. Department of Materials Science, University of Sheffield, Sheffield, United Kingdom*

POSTER SESSIONS

Session DPA

SPINTRONIC DEVICES FOR MEMORY AND COMPUTING (Poster Session)

Shouzhong Peng, Co-Chair
Beihang University, Beijing, China
Luding Wang, Co-Chair
Eindhoven University of Technology, Eindhoven, Netherlands

DPA-01. **Spiking dynamics with dual free layer MTJ.** *L. Farcis*[1], B. Da Silva Teixeira[1], P. Talatchian[1], U. Ebels[1], S. Auffret[1], D. Salomoni[1], B. Dieny[1], L. Prejbeanu[1], A. Mizrahi[2], J. Grollier[2], R. Sousa[1] and L.D. Buda-Prejbeanu[1] *1. SPINTEC, Univ. Grenoble Alpes, CEA, CNRS, Grenoble, France; 2. Unité Mixte de Physique CNRS/Thales, Université Paris-Saclay, Palaiseau, France*

DPA-02. **Symmetrical Voltage-Controlled Stochasticity of Perpendicular Synthetic Antiferromagnetic Magnetic Tunnel Junctions.** *Y. Lv*[1], B.R. Zink[1], D. Zhang[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

DPA-03. **Ultra-low current density switching via voltage-controlled exchange coupling assisted with spin-orbit torque.** *B.R. Zink*[1], D. Zhang[1], H. Li[2], O. Benally[1], Y. Lv[1], D. Lyu[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

DPA-04. **Simultaneous measurement of thickness, saturation magnetization and exchange parameter using propagating spinwaves.** G. Riley[1,3], J.M. Shaw[1], T.J. Silva[1] and *H. Nembach*[1,2] *1. Quantum Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO, United States; 2. Department of Physics, University of Colorado Boulder, Boulder, CO, United States; 3. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States*

DPA-05. **Evaluation of magnetic flux density distribution of magnetic domains recorded in racetrack memory by TMR head.** *S. Kambe*[1], S. Ranjbar[1], K. Tanabe[1], S. Sumi[1] and H. Awano[1] *1. Toyota technological institute, Nagoya, Japan*

DPA-06. **Observation of unidirectional spin Hall magnetoresistance in amorphous $PtSn_4$/CoFeB bilayers.** *Y. Fan*[1], Z. Cresswell[2], S. Guo[3], D. Zhang[2], T. Peterson[2], J. Liu[1], Y. Lv[1], A. Mkhoyan[3] and J. Wang[1] *1. Electrical Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Physics, University of Minnesota, Minneapolis, MN, United States; 3. Material Science, University of Minnesota, Minneapolis, MN, United States*

DPA-07. **Dependence of TMR and RA on Fe insertion layer thickness in MTJs using $L1_0$-(MnCo)Al electrode and $MgAl_2O_4$ insulating layer.** *R. Kikuchi*[1], M. Al-Mahdawi[2], M. Tsunoda[1] and M. Oogane[1] *1. Tohoku University, Sendai, Japan; 2. Center for Science and Innovation in Spintronics (CSIS), Sendai, Japan*

DPA-08. **CoFeBX layers for MgO-based magnetic tunnel junction sensors with improved noise and detectivity.** *F. Matos*[1,2], L. Martins[2], A.B. Azevedo[2], R. Macedo[1], P. Freitas[1,2] and S. Cardoso[1,2] *1. Instituto de Engenharia de Sistemas E Computadores – Microsistemas e Nanotecnologias (INESC MN), Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal*

DPA-09. **Double Barrier s-PMA MTJ-based Logic Locking in Hardware Security.** *D. Divyanshu*[1], R. Kumar[1], D. Khan[1], S. Amara[1] and Y. Massoud[1] *1. Computer, Electrical and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

DPA-10. **Hierarchical Cache Configuration Based on Hybrid SOT- and STT-MRAM.** *S. Han*[1], Q. Wang[1] and Y. Jiang[1] *1. Electrical Engineering, School of Internet of Things (IoTs), Jiangnan University, Wuxi, China*

DPA-11. **High reliability of STT-MRAM with enhanced magnetic immunity.** *G. Zhang*[1] and Y. Jiang[1] *1. Department of Electrical Engineering, Jiangnan University, Wuxi, China*

DPA-12. **Novel multi-bit parallel pipeline-circuit design for STT-MRAM.** *G. Zhang*[1] and Y. Jiang[1] *1. Department of Electrical Engineering, Jiangnan University, Wuxi, China*

DPA-13. **Binary weight network utilizing multi-functional spin-orbit torque device for image recognition.** *W. Li*[1], Y. Tao[1], L. Yang[1], F. Jin[1], X. Liu[2], H. Xu[2], X. Wang[2] and K. Dong[1] *1. School of Automation, China University of Geosciences, Wuhan, China; 2. Changxin Memory Technologies, Hefei, China*

DPA-14. **Switching of an Antiferromagnet with Neuromorphic Functionality.** *J. Zubáč*[1,2], M. Surýnek[2], V. Novák[1], P. Němec[2], T. Jungwirth[1,3] and K. Olejník[1] *1. Department of Spintronics and Nanoelectronics, FZU - Institute of Physics of the Czech Academy of Sciences, Prague, Czechia; 2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 3. School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom*

Session EOA

ANTIFERROMAGNETIC SPINTRONICS I

Kab-Jin Kim, Co-Chair
Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea
Myoung-Woo Yoo, Co-Chair
University of Illinois at Urbana-Champaign, Urbana, IL, United States

EOA-01. **Observation of the spin splitting torque and its inverse effect in an antiferromagnet.** ***(Invited)*** *C. Song*[1], H. Bai[1] and X. Fan[2] *1. Tsinghua University, Beijing, China; 2. Lanzhou University, Lanzhou, China*

EOA-02. **Withdrawn**

EOA-03. **Anomalous Hall effect in Pt/$(Al_{0.04}Cr_{0.96})_2O_3$ epitaxial bilayer.** *I. Iino*[1], H. Sakurai[1], T. Tada[1], K. Toyoki[1,2], R. Nakatani[1,2] and Y. Shiratsuchi[1,2] *1. Department of Materials Science and Engineering, Osaka University, Suita, Japan; 2. Spintronics Research Network Division, Osaka University, Suita, Japan*

EOA-04. **Spin-Orbit Torque Switching Of Non-Collinear Antiferromagnet Mn_3NiN.** *P. Madhusudan Rao*[1], B.K. Hazra[1], B. Pal[1], J. Jeon[1], J. Yoon[1] and S. Parkin[1] *1. Nanosystems for Ions, Spins and Electrons, Max Planck Institute of Microstructure Physics, Halle (Saale), Germany*

EOA-05. **Nonlinear Hall effect in antiferromagnet/heavy-metal bilayers.** *S. Shim*[1], M. Mehraeen[2], J. Sklenar[3], J. Gibbons[4], H. Saglam[5], A. Hoffmann[4], S. Zhang[2] and N. Mason[1] *1. Physics, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 2. Physics, Case Western Reserve University, Cleveland, OH, United States; 3. Physics, Wayne State University, Detroit, MI, United States; 4. Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 5. Electrical and Computer Engineering, Princeton University, Princeton, NJ, United States*

EOA-06. **Observation of Short-Period Helical Spin Order in Nonchiral Centrosymmetric Helimagnet MnCoSi.** *B. Ding*[1], Y. Yao[1], Y. Lau[1] and W. Wang[2] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Tiangong University, Tianjing, China*

EOA-07. **Long-range supercurrents through a chiral non-collinear antiferromagnet in lateral Josephson junctions. *(Invited)*** *K. Jeon*[1,3], B.K. Hazra[3], K. Cho[4,3], A. Chakraborty[3], J. Jeon[3], H. Han[3], H. Meyerheim[3], T. Kontos[2] and S. Parkin[3] *1. Physics, Chung-Ang University (CAU), Seoul, The Republic of Korea; 2. ENS, Université PSL, CNRS, Paris, France; 3. Max Planck Institute (MPI) of Microstructure Physics, Halle/Saale, Germany; 4. Korea Institute of Science and Technology (KIST), Seoul, The Republic of Korea*

EOA-08. **Control of Néel Vector with Spin-Orbit Torques in an Antiferromagnetic Insulator with Tilted Easy Plane.** *P. Zhang*[1], C. Chou[1,2], H. Yun[3], B.C. McGoldrick[1], J.T. Hou[1], A. Mkhoyan[3] and L. Liu[1] *1. Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Physics, Massachusetts Institute of Technology, Cambridge, MA, United States; 3. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States*

EOA-09. **Insight into the structural and magnetotransport properties of epitaxial α-Fe_2O_3/Pt(111) heterostructures.** *A. Koziol-Rachwal*[1], N. Kwiatek[2], W. Skowronski[3], K. Grochot[3], J. Kanak[3], E. Madej[2], K. Freindl[2], J. Korecki[2] and N. Spiridis[2] *1. Faculty of Physics and Applied Computer Science, Krakow, Poland; 2. Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Krakow, Poland; 3. Institute of Electronics, AGH University of Science and Technology, Krakow, Poland*

EOA-10. **Néel spin-orbit torque induced remnant switching of the Néel vector in antiferromagnetic Mn_2Au.** *Y. Lytvynenko*[1,2], S. Reimers[1], Y.R. Niu[3], E. Golias[3], M. Kläui[1,4] and M. Jourdan[1] *1. Institute of Physics, Johannes Gutenberg University, Mainz, Germany; 2. Institute of Magnetism of the NAS of Ukraine and MES of Ukraine, Kyiv, Ukraine; 3. MAX IV Laboratory, Lund, Sweden; 4. Norwegian University of Science and Technology, Trondheim, Norway*

EOA-11. **Probing magnetic anisotropy and spin-reorientation transition in 3D antiferromagnet, $Ho_{0.5}Dy_{0.5}FeO_3$ │Pt using spin Hall magnetoresistance.** P. Garg[1], *A.A. Wagh*[1], A. Haldar[2,1], K. Mallick[1], T. Chakraborty[1], S. Elizabeth[1] and P. Kumar[1] *1. Physics Department, Indian Institute of Science, Bengaluru, India; 2. Physics Department, University of Toronto, Toronto, ON, Canada*

EOA-12. **Injection Locking of Antiferromagnetic Oscillators.** *P.G. Elphick*[1,2], V. Tyberkevych[1] and A.N. Slavin[1] *1. Oakland University, Rochester, MI, United States; 2. Kostal North America, Troy, MI, United States*

EOA-13. **Out of plane spin-polarized current from Mn_3Sn/Py interface.** *B.K. Hazra*[1], B. Pal[1], J. Jeon[1] and S. Parkin[1] *1. NISE, Max Planck Institute of Microstructure Physics, Halle (Saale), Germany*

EOA-14. **Symmetry driven large intrinsic magneto-optical signatures in collinear ferrimagnetic and non-collinear antiferromagnetic phases of Mn_3NiN thin films.** F. Johnson[1], J. Zázvorka[2], L. Beran[2], D. Boldrin[3], L. Cohen[1], J. Zemen[4] and *M. Veis*[2] *1. Department of Physics, Imperial College London, London, United Kingdom; 2. Institute of Physics, Charles University, Prague, Czechia; 3. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom; 4. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia*

ORAL SESSIONS

Session EOB
ANTIFERROMAGNETIC SPINTRONICS II
Fernando Ajejas, Chair
University of California, San Diego, San Diego, CA, United States

EOB-01. **Magnetic spin Hall and related effects in noncollinear antiferromagnets.** ***(Invited)*** *H. Chen*[1] *1. Colorado State University, Fort Collins, CO, United States*

EOB-02. **Controlling Antiferromagnetic Domains by Current-Induced Switching and Shape Anisotropy.** *H. Meer*[1], O. Gomonay[1], F. Schreiber[1], C. Schmitt[1], R. Ramos[2,3], L. Schnitzspan[1], M. Mawass[4], F. Kronast[4], S. Valencia[4], E. Saitoh[2,5], J. Sinova[1], L. Baldrati[1] and M. Kläui[1] *1. Insitute of Physics, Johannes Gutenberg University of Mainz, Mainz, Germany; 2. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 3. Centro de Investigación en Química Biolóxica e Materiais Moleculares (CIQUS), Departamento de Química-Física, Universidade de Santiago de Compostela, Santiago de Compostela, Spain; 4. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 5. Department of Applied Physics, The University of Tokyo, Tokyo, Japan*

EOB-03. **Enhancement of Thermal Stability and Switching Efficiency in SOT-MTJs with Antiferromagnetic Channel.** *K. Chen*[1], Y. Chang[2], S. Yang[2], Y. Hsin[2], S. Rahaman[2], I. Wang[2], H. Lee[2], Y. Su[2], G. Chen[2], J. Wei[2], S. Sheu[2], W. Lo[2], C. Wu[4,2], C. Lai[3], D. Tang[2] and Y. Tseng[1] *1. National Yang Ming Chiao Tung University, Hsin-Chu, Taiwan; 2. Industrial Technology Research Institute, Hsinchu, Hsin-Chu, Taiwan; 3. National Tsing Hua University, Hsinchu, Taiwan; 4. National Taiwan University, Taipei, Taiwan*

EOB-04. **Thermal stability of non-collinear antiferromagnetic Mn_3Sn nanodot.** *Y. Sato*[1,2], Y. Takeuchi[3], Y. Yamane[1,4], S. Kanai[1,6], J. Yoon[1,2], J. Ieda[5], H. Ohno[1,6] and S. Fukami[1,7] *1. Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku Univ., Sendai city, Aoba-ku, Japan; 2. Graduate School of Engineering, Tohoku Univ., Sendai city, Aoba-ku, Japan; 3. WPI-AIMR, Tohoku Univ., Sendai city, Aoba-ku, Japan; 4. FRIS, Tohoku Univ., Sendai city, Aoba-ku, Japan; 5. ASRC, JAEA, Naka, Japan; 6. CIES, Tohoku Univ., Sendai city, Aoba-ku, Japan; 7. Inamori Research Institute for Science, Kyoto City, Japan*

EOB-05. **Large antisymmetric interlayer exchange coupling enabling perpendicular magnetization switching by an in-plane magnetic field.** *H. Masuda*[1,2], T. Seki[1,3], Y. Yamane[4,5], R. Modak[3], K. Uchida[3,1], J. Ieda[6], Y. Lau[1], S. Fukami[5,7] and K. Takanashi[1,6] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Department of Materials Science, Graduate School of Engineering, Tohoku University, Sendai, Japan; 3. National Institute for Materials Science, Tsukuba, Japan; 4. Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, Sendai, Japan; 5. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 6. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 7. Advanced Institute for Material Research, Tohoku University, Sendai, Japan*

EOB-06. **Electrical Control of Antiferromagnetic Domain Walls in Weyl Semimetals.** *Y. Semenov*[1,3] and K. Kim[1,2] *1. Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, United States; 2. Department of Physics, North Carolina State University, Raleigh, NC, United States; 3. V. Lashkaryov Institute of Semiconductor Physics, Kyiv, Ukraine*

EOB-07. **Third Harmonic Characterization of Antiferromagnetic Heterostructures.** *Y. Cheng*[1], E. Cogulu[2], R. Resnick[3], J. Michel[3], N.N. Statuto[2], A. Kent[2] and F. Yang[3] *1. Electrical and Computer Engineering, UCLA, Los Angeles, CA, United States; 2. Physics, New York University, New York, NY, United States; 3. Physics, The Ohio State University, Columbus, OH, United States*

EOB-08. **Effect of Temperature on Threshold Current Density for Current-driven Magnetization Switching in Non-collinear Antiferromagnets.** *M. Yoo*[1], V.O. Lorenz[1], D.G. Cahill[1] and A. Hoffmann[1] *1. University of Illinois at Urbana-Champaign, Urbana, IL, United States*

EOB-09. **Observation of Vector Spin Seebeck Effect in a Non-Collinear Antiferromagnet.** *J. Xu*[1], J. He[2], J. Zhou[2], D. Qu[3], S. Huang[3] and C. Chien[1,3] *1. Johns Hopkins University, Baltimore, MD, United States; 2. University of Texas at Austin, Austin, TX, United States; 3. National Taiwan University, Taipei, Taiwan*

EOB-10. **Ab initio comparison of spin-transport properties in ferrimagnetic tunnel junctions based on Mn_3Ga and Mn_3Al.** *M.T. Stamenova*[1], N. Baadji[2] and P.S. Stamenov[1] *1. Physics, Trinity College Dublin, Dublin, Ireland; 2. Physics, University of Mohamed BOUDIAF M'Sila, M'Sila, Algeria*

EOB-11. **Pattern Recognition Using Antiferromagnetic Artificial Spiking Neurons.** *H. Bradley*[1], S. Louis[2] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States; 2. Electrical Engineering, Oakland University, Rochester, MI, United States*

EOB-12. **Sign-tunable anisotropic magnetoresistance and electrically detectable dual magnetic phases in a helical antiferromagnet.** *J. Hong*[1], J. Kim[1], H. Shin[1], M. Kim[1], K. Jeong[1], J. Kim[1], K. Moon[1], N. Lee[1] and Y. Choi[1] *1. Department of Physics, Yonsei University, Seoul, The Republic of Korea*

EOB-13. **Room-temperature anomalous Hall effect and anisotropic magnetoresistance reversal in a van der Waals antiferromagnet.** *H. Shin*[1], M. Kim[1], J. Kim[1], J. Kim[1], J. Hong[1], K. Jeong[1], J. Seo[1], K. Moon[1], N. Lee[1] and Y. Choi[1] *1. Physics, Yonsei University, Seoul, The Republic of Korea*

ORAL SESSIONS

Session EOC
SKYRMIONS I
Olivier Boulle, Chair
SPINTEC, Grenoble, France

EOC-01. **Current-driven dynamics and ratchet effect of skyrmion bubbles in a ferrimagnetic insulator.** ***(Invited)*** *S. Velez*[1,2], S. Ruiz-Gómez[3,4], J. Schaab[1], E. Gradauskaite[1], M.S. Wörnle[1], P. Welter[1], B.J. Jacot[1], C.L. Degen[1], M. Trassin[1], M. Fiebig[1] and P. Gambardella[1] *1. ETH Zurich, Zurich, Switzerland; 2. Universidad Autónoma de Madrid, Madrid, Spain; 3. Universidad Complutense de Madrid, Madrid, Spain; 4. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany*

EOC-02. **Effects of Composition and Sample History on Magnetic Structures in the 2D van der Waals Magnets Fe_xGeTe_2.** *K. Litzius*[1], M. Birch[1], L. Powalla[2,4], F. Schulz[1], S. Wintz[1], M. Weigand[3], K. Kern[2], M. Burghard[2] and G. Schütz[1] *1. Max-Planck-Institute for Intelligent Systems, Stuttgart, Germany; 2. Max-Planck-Institute for Solid State Research, Stuttgart, Germany; 3. Helmholtz Zentrum Berlin, Berlin, Germany; 4. École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland*

EOC-03. **Stabilizing skyrmions deterministically for racetrack memory applications.** *M. Morshed*[1], H. Vakili[2], P.V. Balachandran[3,4] and A.W. Ghosh[1,2] *1. Department of Electrical and Computer Engineering, University of Virginia, Charlottesville, VA, United States; 2. Department of Physics, University of Virginia, Charlottesville, VA, United States; 3. Department of Materials Science and Engineering, University of Virginia, Charlottesville, VA, United States; 4. Department of Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, VA, United States*

EOC-04. **Spin-orbit torque engineering for efficient skyrmion motion.** Y. Sassi[1], S. Krishnia[1], D. Sanz-Hernández[1], S. Collin[1], K. Bouzehouane[1], A. Fert[1], *V. Cros*[1] and N. Reyren[1] *1. Unite Mixte de Physique CNRS, Thales, U. Paris-Saclay, Palaiseau, France*

EOC-05. **Skyrmion resonance induced by the spin hall effect in frustrated Fe_3Sn_2 crystal at room temperature.** *N. Bernstein*[1], H. Li[2], R. Ben Shalom[1], W. Wang[2] and A. Capua[1] *1. The Hebrew University of Jerusalem, Jerusalem, Israel; 2. Chinese Academy of Sciences, Beijing, China*

EOC-06. **Control of the skyrmion passage by a gate electrode.** *K. Hashimoto*[1], R. Ishikawa[2], M. Goto[1,3], H. Nomura[1,3] and Y. Suzuki[1,3] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. ULVAC Inc, Suita, Japan; 3. CSRN-Osaka, Toyonaka, Japan*

EOC-07. **Walking Skyrmions.** *A. Bezvershenko*[1], L. Heinen[1], M. Garst[2], A. Rosch[1], D. Mettus[3], F. Rucker[3], A. Chacon[3], A. Bauer[3], S. Muehlbauer[3] and C. Pfleiderer[3] *1. Institute for Theoretical Physics, University of Cologne, Cologne, Germany; 2. Institute of Theoretical Solid State Physics, Karlsruhe Institute of Technology, Karlsruhe, Germany; 3. Department of Physics, Technical University Munich, Munich, Germany*

EOC-08. **Magnetic anisotropy dependence of entropic generation of skyrmions.** *A.M. Park*[1], S. Yang[2], M. Song[1], M. You[1], T. Ju[2], C. Hwang[2] and K. Kim[1] *1. Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Korea Research Institute of Standards and Science, Daejeon, The Republic of Korea*

EOC-09. **Magneto-structural coupling and skyrmions lattice phase field in the lacunar spinel $GaMo_4Se_8$.** *J. Alaria*[1] *1. Department of Physics & Stephenson Institute for Renewable Energy, University of Liverpool, Liverpool, United Kingdom*

EOC-10. **Angular-dependent magnetoresistance and magnetic soliton lattice in $Cr_{1/3}NbS_2$.** *X. Li*[1,2], B. Ding[1], H. Li[1], X. Xi[1], Y. Lau[1] and W. Wang[3] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. University of Chinese Academy of Sciences, Beijing, China; 3. Tiangong University, Tianjin, China*

EOC-11. **Drastically enhanced thermal skyrmion diffusion in synthetic antiferromagnets.** *T. Dohi*[1], M. Weißenhofer[2], N. Kerber[1], F. Kammerbauer[1], Y. Ge[1], K. Raab[1], J. Zázvorka[3], M. Syskaki[1], A. Shahee[1], M. Ruhwedel[4], T. Böttcher[4], P. Pirro[4], G. Jakob[1], U. Nowak[2] and M. Kläui[1] *1. Institut für Physik, Johannes Gutenberg-Universität Mainz, Mainz, Germany; 2. Fachbereich Physik, Universität Konstanz, Konstanz, Germany; 3. Institute of Physics, Charles University, Prague, Czechia; 4. Fachbereich Physik and Landesforschungszentrum OPTIMAS, Technische Universität Kaiserslautern, Kaiserslautern, Germany*

EOC-12. **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. Department of Physics, Indian Institute of Science Education and Research (IISERB), Bhopal, India; 2. Center for Science and Innovation in Spintronics (CSIS), Tohoku University, Japan, Sendai, Japan; 3. Research Institute of Electrical Communication (RIEC), Tohoku University, Japan, Sendai, Japan; 4. Center for Innovative Integrated Electronic Systems (CIES), Tohoku University, Japan, Sendai, Japan*

EOC-13. **Skyrmion-Caloritronics: a promising Strategy to manipulate Skyrmions.** *E. Raimondo*[1], E. Saugar[2], J. Barker[3], D.R. Rodrigues[4], A. Giordano[1], M. Carpentieri[4], W. Jiang[5], O. Chubykalo-Fesenko[2], R. Tomasello[4] and G. Finocchio[1] *1. University of Messina, Messina, Italy; 2. Instituto de Ciencia de Materiales de Madrid, Madrid, Spain; 3. University of Leeds, Leeds, United Kingdom; 4. Politecnico of Bari, Bari, Italy; 5. Tsinghua University, Beijing, China*

ORAL SESSIONS

Session EOD
SKYRMIONS II
Avik Ghosh, Chair
University of Virginia, Charlottesville, VA, United States

EOD-01. **Skyrmionic 3D cocoons in magnetic multilayers.** ***(Invited)*** *M. Grelier*[1], Y. Sassi[1], C. Leveille[2], R. Battistelli[3], S. Collin[1], A. Vecchiola[1], F. Godel[1], K. Bouzehouane[1], A. Fert[1], F. Büttner[3], H. Popescu[2], N. Jaouen[2], V. Cros[1] and N. Reyren[1] *1. Unité Mixte de Physique CNRS/Thales, Université Paris-Saclay, Palaiseau, France; 2. SOLEIL Synchrotron, Saint-Aubin, France; 3. Helmholtz-Zentrum Berlin, Berlin, Germany*

EOD-02. **Spatial control of the nucleation and dynamics of magnetic skyrmions by FIB irradiation.** *S. Miki*[1,2], K. Hashimoto[1,2], R. Ishikawa[3], E. Tamura[1,2], H. Nomura[1,2], M. Goto[1,2] and Y. Suzuki[1,2] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. CSRN-Osaka, Osaka University, Toyonaka, Japan; 3. ULVAC, Inc., Suita, Japan*

EOD-03. **Over 1 km/s Current Induced Skyrmion Motion in Synthetic Antiferromagnets without Skyrmion Hall Effect.** V. Pham[1], N. Sisodia[1], J. Urrestarazu-Larrañaga[1], K. Bairagi[1], J. Pelloux-Prayer[1], L.D. Buda-Prejbeanu[1], S. Pizzini[2], G. Gaudin[1] and *O. Boulle*[1] *1. SPINTEC, Grenoble, France; 2. Institut Néel, Grenoble, France*

EOD-04. **Magnetic and Transport Properties of Chiral Antiferromagnetic $Co_{2-x}Pd_xMo_3N$ Thin Films.** *B. Qiang*[1], T. Fukasawa[1], T. Hajiri[1], T. Hihara[2] and H. Asano[1] *1. Nagoya University, Nagoya, Japan; 2. Nagoya Institute of Technology, Nagoya, Japan*

EOD-05. **Microwave-Driven Phenomena of Magnetic Skyrmions.** *M. Mochizuki*[1] *1. Department of Applied Physics, Waseda University, Shinjuku-ku, Japan*

EOD-06. **Nonlinear dynamics of bimeron in antiferromagnetic materials.** *Y. Zhou*[1] *1. The Chinese University of Hong Kong (Shenzhen), Shenzhen, China*

EOD-07. **Topological Stability and Thermal Hysteretic Behavior of Metastable Néel Skyrmion Lattices in Fe_3GeTe_2.** *Y. Li*[1], A.R. McCray[1,2], R. Basnet[3], K. Pandey[4], J. Hu[3,4], D. Phelan[1], W. Wang[5], X. Ma[5], A. Petford-Long[1,6] and C. Phatak[1,6] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Applied Physics Program, Northwestern University, Evanston, IL, United States; 3. Department of Physics, University of Arkansas, Fayetteville, AR, United States; 4. Materials Science and Engineering Program, University of Arkansas, Fayetteville, AR, United States; 5. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 6. Department of Materials Science and Engineering, Northwestern University, Evanston, IL, United States*

EOD-08. **Zero-field Magnetic Skyrmions in Multilayer Films Stabilized by Interplay of Interlayer Exchange Couplings.** *X. Chen*[1], T. Tai[1,2], H. Tan[1], H. Tan[1], R. Lim[1], P. Ho[1] and A. Soumyanarayanan[3,1] *1. Institute of Materials Research and Engineering, Singapore, Singapore; 2. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 3. Department of Physics, National University of Singapore, Singapore, Singapore*

EOD-09. **Reversal of skyrmion topological deflection across the angular compensation in GdCo ferrimagnetic thin-film.** *L. Berges*[1], A. Mougin[1], J. Sampaio[1], R. Weil[1] and E. Haltz[1] *1. Physics, Laboratoire de Physique des Solides, Orsay, France*

EOD-10. **High Endurance Skyrmion Control Via Vertical Current Injection with HfOx/Pt Top Electrode.** *H. Jun*[1], S. Lee[1], H. Kwon[2], Y. Choi[1], J. Choi[2], T. Shim[2] and J. Park[1,2] *1. Department of Nanoscale Semiconductor Engineering, Hanyang university, Seoul, The Republic of Korea; 2. Department of Electronic Engineering, Hanyang University, Seoul, The Republic of Korea*

EOD-11. **Withdrawn**

Session EOE
SPIN-ORBITRONICS I

Shinji Isogami, Co-Chair
National Institute for Materials Science, Tsukuba, Japan
Tomohiro Taniguchi, Co-Chair
National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

EOE-01. **Spin currents generation and self Spin-Orbit torque in GdFeCo ferrimagnet.** ***(Invited)*** *H. Damas*[1], D. Céspedes-Berrocal[1,2], J. Bello[1], D. Maccariello[5], A. Anadon[1], V. Desbuis[1], A. Arriola-Cordova[1,2], J. Alegre-Saenz[1,2], P. Tang[3], P. Vallobra[1], Y. Xu[1], S. Migot[1], J. Ghanbaja[1], S. Zhang[3], D. Lacour[1], S. Mangin[1], C. Panagopoulos[4], V. Cros[5], M. Hehn[1], S. Petit-Watelot[1], A. Fert[5] and J. Rojas-Sanchez[1] *1. Institut Jean Lamour, Université de Lorraine, CNRS, Nancy, France; 2. Universidad Nacional de Ingeneria, Rimac, Peru; 3. Departement of Physics, University of Arizona, Tucson, AZ, United States; 4. Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore; 5. Unité Mixte de Physique, CNRS, Thalès, Palaiseau, France*

EOE-02. **Spin-orbit torques in Gd/CoFeB/MgO heterostructures.** *J. O'Brien*[1], P. Khanal[1], B. Zhou[1], A. Habiboglu[1] and W. Wang[1] *1. Physics, University of Arizona, Tucson, AZ, United States*

EOE-03. **Effect of alloying on spin-orbit torque in $Fe_{0.75}Co_{0.25}|Pt_{1-x}X_x$ bilayers.** *G.G. Baez-Flores*[1] and K. Belashchenko[1] *1. Physics and Astronomy, University of Nebraska - Lincoln, Lincoln, NE, United States*

EOE-04. **Chemical Tuning of Ferroelectricity and Rashba Spin Texture in the ternary Alloy $Sn_xGe_{1-x}Te$.** *L. Nessi*[1,2], F. Fagiani[1], F. Belponer[1], F. Delodovici[3], S. Cecchi[4], R. Kumar[5,6], M. Cantoni[1,2], D. Mondal[7], F. Mazzola[7], G. Vinai[7], V. Polewczyk[7], J. Fujii[7], M. Fiebig[6], A. Rubano[5], R. Calarco[8], R. Bertacco[1,2], I. Vobornik[7], S. Picozzi[3] and C. Rinaldi[1,2] *1. Politecnico di Milano, Milan, Italy; 2. Istituto di Fotonica e Nanotecnologie CNR-IFN, Consiglio Nazionale delle Ricerche, Milan, Italy; 3. Consiglio Nazionale delle Ricerche, CNR-SPIN, Chieti, Italy; 4. Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; 5. Dipartimento di Fisica "E. Pancini", Università Federico II, Naples, Italy; 6. Department of Materials, ETH Zurich, Zurich, Switzerland; 7. Istituto Officina dei Materiali (IOM)-CNR, Trieste, Italy; 8. Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi (CNR-IMM), Rome, Italy*

EOE-05. **Peculiarities of measured dependencies of strength of spin-orbit interaction and anisotropy field on current density in FeCoB nanomagnet.** *V. Zayets*[1], I. Serdeha[2] and V. Grygoruk[2] *1. Platform Photonics Research Center, AIST, Tsukuba, Japan; 2. Educational and Scientific Institute of High Technologies, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

EOE-06. **Spin-orbit Torques in Magnetron-Sputtered $MoTe_2$.** *S. Li*[1], J. Gibbons[1] and A. Hoffmann[1] *1. University of Illinois at Urbana-Champaign, Urbana, IL, United States*

EOE-07. **High-efficiency magnetization switching via electrical manipulation of exchange bias and magnon current. *(Invited)*** B. Fang[1], D. Zheng[1], Y. Li[1], A. Chen[1], K. Liu[2] and *X. Zhang*[1] *1. PSE, KAUST, Thuwal, Saudi Arabia; 2. Physics, Georgetown University, DC, DC, United States*

EOE-08. **Interfacial potential gradient modulates Dzyaloshinskii-Moriya interaction in Pt|Co|Metal multilayers.** *F. Ajejas*[1,2], Y. Sassi[2], W. Legrand[2], S. Collin[2], J. Peña-Garcia[3], A. Thiaville[4], S. Pizzini[3], N. Reyren[2], V. Cros[2] and A. Fert[2] *1. Physics, University of California, San Diego, San Diego, CA, United States; 2. Unité Mixte de Physique CNRS/Thales, Palaiseau, France; 3. Institut Néel, Grenoble, France; 4. Laboratoire de Physique des Solides, Université Paris-Saclay, Orsay, France*

EOE-09. **Blanket Film Spin-Orbit Torque Characterization via Four Probe Measurement.** *H. Poh*[1], C. Ang[1], T. Jin[1], F. Tan[1], G. Lim[1] and W. Lew[1] *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

EOE-10. **Power-efficient SOT properties of W-Si/CoFeB heterostructures.** *S. Yoon*[1], T. Kim[1], Q.T. Nguyen[2], G.W. Kim[1], M. Lee[1], S.H. Rhim[2] and Y. Kim[1] *1. Materials Science and Engineering, Korea University, Seoul, The Republic of Korea; 2. Physics, Ulsan University, Ulsan, The Republic of Korea*

EOE-11. **Large Voltage Controlled Magnetic Anisotropy (VCMA) Effect at metalloporphyrin decorated Graphene/Ferromagnet interface.** *A. Shukla*[1], A. Erram[1], H. Mendonca[1], D. Kumar[1], R. Pandey[1], A. Chouhan[1] and A. Tulapurkar[1] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

EOE-12. **Rashba-like spin textures in Graphene promoted by ferromagnet-mediated Electronic-Hybridization with heavy metal.** A. Gudín[1], B. Muñiz[1], I. Arnay[1], P. Olleros-Rodríguez[1], A. Anadón[1], M. Valvidares[3], G. Bihlmayer[2], R. Miranda[1], J. Camarero[1], M. Valbuena[1] and *P. Perna*[1] *1. IMDEA Nanociencia, Madrid, Spain; 2. Peter Grünberg Institut and Institut for Advanced Simulation, Forschungszentrum Jülich, Julich, Germany; 3. ALBA synchrotron, Cerdanyola del Valles, Spain*

EOE-13. **Evidence of unconventional spin-orbit torque in SnS/$Ni_{80}Fe_{20}$ heterostructures.** *H. Bangar*[1], P. Gupta[1], S. Dewan[2], R. Mudgal[1], S. Das[3] and P.K. Muduli[1] *1. Department of Physics, Indian Institute of Technology Delhi, New Delhi, India; 2. School of Interdisciplinary Research, Indian Institute of Technology Delhi, New Delhi, India; 3. Center for Applied Research in Electronics, Indian Institute of Technology Delhi, New Delhi, India*

EOE-14. **Field-free switching of perpendicular magnetization by spin-orbit torques originating from an in-plane magnetized Co_2MnAl spin source.** *D. Morita*[1], T. Hara[1], M. Yamanouchi[1] and T. Uemura[1] *1. Information Science and Technology, Hokkaido University, Sapporo, Japan*

ORAL SESSIONS

Session EOF
SPIN-ORBITRONICS II
Victor Lopez Dominguez, Chair
Northwestern University, Evanston, IL, United States

EOF-01. **Field-free deterministic spin-orbit torque switching of magnetization using Weyl semimetals.** ***(Invited)*** *S. Singh*[1] *1. Department of Physics, Carnegie Mellon University, Pittsburgh, PA, United States*

EOF-02. **Enhanced spin-orbit torque in amorphous light element silicide.** *C. Hsu*[1*], J. Karel[2], N. Roschewsky[3], H. Kleidermacher[4], S. Sayed[1], S. Cheema[5], S. Bouma[3], F. Hellman[3,5] and S. Salahuddin[1] *1. Electrical Engineering and Computer Science, University of California Berkeley, Berkeley, CA, United States; 2. Materials Science and Engineering, Monash University, Clayton, VIC, Australia; 3. Physics, University of California Berkeley, Berkeley, CA, United States; 4. Electrical Engineering and Computer Science, University of California Berkeley, Berkeley, CA, United States; 5. Materials Science and Engineering, University of California Berkeley, Berkeley, CA, United States*

EOF-03. **Harnessing the spin and orbital dynamics of iron-based 2D van der Waals ferromagnets.** *T.G. Saunderson*[1,2], F. Martin[1], M. Schmitt[1], A. Liedtke[1], P. Rüßmann[2,3], A. Shahee[1], H.T. Simensen[4], A. Tavabi[5], T. Denneulin[5], T. Scholz[6], D. Go[2], M. Gradhand[7,1], K. Lee[1,8], P. Mavropoulos[9], A. Kovacs[5], B. Lotsch[6], R.E. Dunin-Borkowski[5], S. Bluegel[2], A. Brataas[4], Y. Mokrousov[2,1] and M. Kläui[1,4] *1. Institute of Physics, Johannes Gutenberg University of Mainz, Mainz, Germany; 2. Peter Grünberg Institut and Institute for Advanced Simulation, Research Center Jülich, Jülich, Germany; 3. Institute of Theoretical Physics and Astrophysics, University of Würzburg, Würzburg, Germany; 4. Centre for Quantum Spintronics, Norwegian University of Science and Technology, Trondheim, Norway; 5. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons, Research Center Jülich, Jülich, Germany; 6. Max Planck Institute for Solid State Research, Stuttgart, Germany; 7. H. H. Wills Physics Laboratory, University of Bristol, Bristol, United Kingdom; 8. Department of Semiconductor Physics, Korea University, Sejong, The Republic of Korea; 9. Department of Physics, National and Kapodistrian University of Athens, Athens, Greece*

EOF-04. **Enhancement of current to spin current conversion efficiency in synthetic antiferromagnetic layer system.** *Y. Saito*[1], S. Ikeda[1,2] 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*

EOF-05. **Detection of long-range orbital torques.** *A. Bose*[1], F. Kammerbauer[1], D. Go[1,2], Y. Mokrousov[1,2], G. Jakob[1] and M. Kläui[1,3] *1. Institute of Physics, Johannes Gutenberg University Mainz, Germany, Mainz, Germany; 2. Institute for Advanced Simulation, Forschungszentrum, Peter Grünberg Institut, Jülich and JARA, 52425 Jülich, Germany, Jülich, Germany; 3. Graduate School of Excellence Materials Science, Johannes Gutenberg University, Mainz, Germany*

EOF-06. **First-principles calculation of the 3m spin-orbit torque and simulation of its effect on magnetization dynamics in a nanodisk.** *W. Fang*[1], E. Schwartz[1], A.A. Kovalev[1] and K. Belashchenko[1] *1. Physics, University of Nebraska-Lincoln, Lincoln, NE, United States*

EOF-07. **Tunable spin orbit torques in Ferrimagnet/Ferromagnetic heterostructures.** *N. Behera*[1], L. Bainsla[1], A.A. Awad[1], A. Kumar[1], R. Khymyn[1] and J. Åkerman[1] *1. Department of Physics, University of Gothenburg, Gothenburg 41296, Sweden*

EOF-08. **Unconventional spin-orbital torque enhanced magnetization switching by interface oxidation in CuPt/CoPt bilayer.** *T. Zhao*[1], L. Liu[1], C. Zhou[1] and J. Chen[1] *1. Department of Materials Science and Engineering, National University of Singapore, Singapore, Singapore*

EOF-09. **Spin-orbit torque switching mediated by orbital currents from CuN_x.** *T. Chen*[1], Y. Hsiao[1], W. Liao[1] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan*

EOF-10. **Growth, characterization and spin-orbit torque of BiSb topological insulator/MnGa perpendicular ferromagnet systems.** *D. She*[1,2], N. Figueiredo Prestes[1], L. Baringthon[1], S. Husain[1], L. Largeau[2], M. Morassi[2], H. Jaffres[1], N. Reyren[1], P. Le Fevre[3], J. George[1] and A. Lemaitre[2] *1. Unite Mixte de Physique CNRS, Thales, Univ. Paris Saclay, Palaiseau, France; 2. Centre de Nanosciences et Nanotechnologies (C2N), Palaiseau, France; 3. Synchrotron SOLEIL, Saint-Aubin, France*

EOF-11. **Intrinsic Anomalous Hall Effect and Spin Orbit Torques in Amorphous Transition Metal Silicides and Germanides.** *J. Karel*[1], C. Hsu[2], S. Bouma[3], C. Fuchs[3], P. Corbae[4], N. Roschewsky[2], S. Salahuddin[2] and F. Hellman[3,1] *1. Materials Science and Engineering, Monash University, Melbourne, VIC, Australia; 2. Electrical Engineering and Computer Science, University of California Berkeley, Berkeley, CA, United States; 3. Department of Physics, University of California Berkeley, Berkeley, CA, United States; 4. Materials Science and Engineering, University of California Berkeley, Berkeley, CA, United States*

EOF-12. **Current induced magnetization switching in (Mn-Cr) AlGe films showing perpendicular magnetization.** *T. Kubota*[1], S. Honda[2], Y. Sonobe[3,4], T. Kato[3] and K. Takanashi[5,1] *1. Tohoku University, Sendai, Japan; 2. Kansai University, Suita, Japan; 3. Nagoya University, Nagoya, Japan; 4. Waseda University, Tokyo, Japan; 5. Japan Atomic Energy Agency, Tokai, Japan*

EOF-13. **Giant spin Hall effect in a half-Heusler alloy topological semimetal with high thermal stability.** *T. Shirokura*[1], F. Tuo[1], N. Huynh Duy Khang[1] and P. Nam Hai[1] *1. Tokyo Institute of Technology, Meguro, Japan*

EOF-14. **Electric field controlled quantitative magnetization switching with spin-orbit torque.** *X. Li*[1], H. Singh[2], J. Chatterjee[2], M. Goikoetxea[4], Z. Xiao[3], S. Mondal[2], N. Tamura[5], R.N. Candler[3], L. You[1], J. Bokor[2] and J. Hong[1,2] *1. Huazhong University of Science and Technology, WuHan, China; 2. EECS, University of California, Berkeley, CA, United States; 3. University of California, Los Angeles, Los Angeles, CA, United States; 4. University of the Basque Country, Euskadi, Spain; 5. Lawrence Berkeley National Lab, Berkeley, CA, United States*

POSTER SESSIONS

Session EPA
ANTIFERROMAGNETIC SPINTRONICS III (Poster Session)
Takeshi Seki, Chair
Tohoku University, Sendai, Japan

EPA-01. **Intrinsic Unidirectional Anisotropic Magnetoresistance in Thin-Film FeRh.** *E. Blake*[1], G. Newman[1], P. Sparks[1], J. Eckert[1], Y. Xiao[2], S. Patel[2] and E. Fullerton[2] *1. Physics, Harvey Mudd College, Claremont, CA, United States; 2. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States*

EPA-02. **Crystallisation Control of polycrystalline PtMn via Seed Layers.** *W.J. Frost*[2], R. Carpenter[1], S. Couet[1] and G. Vallejo-Fernandez[2] *1. imec, Leuven, Belgium; 2. Department of Physics, University of York, York, United Kingdom*

EPA-03. **Investigation of spiral phase in multiferroic $YBaCuFeO_5$ | Pt heterostructure using spin Hall magnetoresistance.** *K. Jha*[1], A.A. Wagh[1], S. Elizabeth[1] and P. Kumar[1] *1. Physics, Indian Institute of Science, Bangalore, Bangalore, India*

EPA-04. **Interfacial Exchange Phenomena Driven by Ferromagnetic Domains.** J. Diez[1], J. Cuñado[1], P. Lapa[2], R. Solis[1], I. Arnay[1], P. Pedraz[1], P. Perna[1], A. Bollero[1], R. Miranda[1], I.K. Schuller[2] and *J. Camarero*[1] *1. IMDEA NANOCIENCIA, Madrid, Spain; 2. Department of Physics and Center for Advanced Nanoscience, University of California, San Diego, La Jolla, CA, United States*

EPA-05. **Tailoring compensated ferrimagnetic state in quaternary Mn-Ru-V-Ga Heusler compounds.** *J. Liang*[1], W. Wang[2] and Y. Lau[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. Tiangong University, Tianjin, China*

EPA-06. **XAS and XMCD Study of the Magnetic Anisotropy Transition in Co-substituted Mn_3Ga Heusler Films.** *J. Kang*[1], S. Seong[1], Y. Seo[1], G. Lim[1], W. Yoo[2], M. Jung[2] and S. Han[3] *1. Physics, The Catholic University of Korea, Bucheon, The Republic of Korea; 2. Physics, Sogang University, Seoul, The Republic of Korea; 3. Physics, University of Ulsan, Ulsan, The Republic of Korea*

EPA-07. **Atomistic Control of Magnetocrystalline Anistropy in Antiferromagnets.** *R.A. Lawrence*[1] and M.I. Probert[1] *1. Department of Physics, University of York, York, United Kingdom*

EPA-08. **Manipulation of Exchange Bias Using Spin-Orbit Torque.** *F. Ajejas*[1], A.C. Basaran[1] and I.K. Schuller[1] *1. Physics, University of California, San Diego, San Diego, CA, United States*

EPA-09. **Impact of Interactions on Topological Magnonic Transport.** *K. Sourounis*[1] and A. Manchon[1] *1. Theory and Numerical Simulations, CINaM, Aix-Marseille Universite, Marseille, France*

EPA-10. **Nanoscale antiferromagnetic vortex states in individual NiO/Fe nanostructures.** *M. Slezak*[1], P. Drozdz[1], A. Koziol-Rachwal[1], T. Mentes[2], A. Locatelli[2], D. Wilgocka-Slezak[3] and T. Slezak[1] *1. AGH University of Science and Technology, Krakow, Poland; 2. Elettra - Sincrotrone Trieste, Basovizza, Trieste, Italy; 3. Jerzy Haber Institute of Catalysis and Surface Chemistry PAS, Krakow, Poland*

EPA-11. **Current-Driven Domain Wall Motion in a Synthetic Antiferromagnet Multilayer.** *C.E. Barker*[1], S. Finizio[2], E. Haltz[1], S. Mayr[2], P.M. Shepley[1], T.A. Moore[1], G. Burnell[1], J. Raabe[2] and C. Marrows[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Photon Science Division, Paul Scherrer Institut, Villigen, Switzerland*

EPA-12. **Large anomalous Hall effect and anisotropic magnetoresistance in intrinsic nanoscale spin-valve-type structure of an antiferromagnet.** *K. Jeong*[1], D. Oh[1], J. Kim[1], M. Kim[1], H. Shin[1], J. Hong[1], J. Kim[1], K. Moon[1], N. Lee[1] and Y. Choi[1] *1. Physics, yonsei university, Seoul, The Republic of Korea*

EPA-13. **Magnetoresistance in Helical Antiferromagnet Eu Metal Thin Films.** *N. Shrestha*[1] and J. Tang[1] *1. Physics and Astronomy, University of Wyoming, Laramie, WY, United States*

EPA-14. **Tailored non-collinear magnetic structure in 111- and 110-oriented Mn_4(N,B) thin films.** *S. Isogami*[1], M. Ohtake[2] and Y. Takahashi[1] *1. National Institute for Materials Science, Tsukuba, Japan; 2. Yokohama National University, Yokohama, Japan*

EPA-15. **Characterization of laser pulse-induced quenching of resistivity of antiferromagnetic CuMnAs.** *A. Farkaš*[1,2], K. Olejník[1], M. Surýnek[2], P. Němec[2], V. Novák[1] and T. Jungwirth[1] *1. FZU - Institute of Physics of the Czech Academy of Sciences, Prague, Czechia; 2. Faculty of Mathematics and Physics, Charles University, Prague, Czechia*

Session EPB
SKYRMIONS AND SPIN-ORBITRONICS (Poster Session)

Yue Li, Chair
Argonne National Laboratory, Downers Grove, IL, United States

EPB-01. **Zero-field room-temperature skyrmion lattice stabilized by bias layer coupling in magnetic multilayers.** *F. Ajejas*[1,2], Y. Sassi[2], W. Legrand[2], S. Collin[2], K. Bouzehouane[2], A. Vecchiola[2], A. Fert[2], N. Reyren[2] and V. Cros[2] *1. Physics, University of California, San Diego, San Diego, CA, United States; 2. Unité Mixte de Physic CNRS/Thales, Palaiseau, France*

EPB-02. **In-field critical behaviour of β-Mn type $Co_7Zn_7Mn_6$ skyrmion host.** *P. Yadav*[1], Y. Bitla[2], A. Kumar Patra[2] and G. Basheed[1] *1. CSIR National Physical Laboratory, New Delhi, India; 2. Department of Physics, Central University of Rajasthan, Ajmer, India*

EPB-03. **Effects of self-torque in rare earth-transition metal alloy on the magnetization switching by spin-orbit torque.** *P. Lee*[1], C. Huang[1], S. Mangin[2] and C. Lai[1] *1. Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan; 2. Institute Jean Lamour, Nancy, France*

EPB-04. **Asymmetric Pt/Co magnetic multilayers bubble expansion under in-plane and out-of-plane field.** *S. Amara*[1], A. Ganguly[2], D. Khan[1], G. Das[2] and Y. Massoud[1] *1. Computer, Electrical and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 2. Khalifa University, Abu Dhabi, United Arab Emirates*

EPB-05. **Magnetic skyrmion nucleation via current injection in confined nanowire with modified perpendicular anisotropy region.** Z. Chen[1], *G. Yu*[1], X. He[1], X. Cai[1], M. Zhu[1], Y. Qiu[1] and H. Zhou[1] *1. China Jiliang University, Hangzhou, China*

EPB-06. **Magnetization-independent field-free spin-orbit torque switching in Py-based magnetic trilayer.** *W. Liao*[1], T. Chen[1], T. Tsai[1], C. Huang[1], Y. Huang[1], Y. Lin[1], H. Yen[1] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan*

EPB-07. **Rotator Gates for Six-state Boolean Spin Logic - Six state Rotation, half-Compliment, complimentary logic gates using Spin orbit Effect.** *M. Isaacs*[1], A. Xu[1], V. Singh[1], H. Ketineni[1], A. Shakya[1], A. Iyer[1] and S. Manipatruni[1,2] *1. Feynman Physics Academy, Portland, OR, United States; 2. Cornell University, Ithaca, NY, United States*

EPB-08. **Spin-orbit torque driven in-homogeneous spin configuration dependent energy in laterally asymmetric perpendicular magnetic anisotropy system.** *S. An*[1], H. Seo[1], E. Baek[1], K. Lee[1], S. Lee[1], M. Park[1], D. Kim[1], J. Kim[1] and C. You[1] *1. DGIST, Daegu, The Republic of Korea*

EPB-09. **Logic devices based on gate-controlled skyrmion trajectory.** *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. Department of Physics, Indian Institute of Technology Hyderabad, Sangareddy, India*

EPB-10. **Observation of non-local orbital transport and sign reversal of damping-like torque in Nb/Ni and Ta/Ni bi-layers.** *S. Dutta*[1] and A. Tulapurkar[1] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

EPB-11. **Measurement of Orthogonal Spin-orbit Field Current along the [010] Crystallographic Direction in GaMnAs Film.** *K. Han*[1], K. Lee[1], S. Lee[1], X. Liu[2], M. Dobrowolska[2] and J. Furdyna[2] *1. Department of Physics, Korea University, Seoul, The Republic of Korea; 2. Department of Physics, University of Notre Dame, Notre Dame, IN, United States*

EPB-12. **Stable Multi-level States Induced by Spin-orbit Torque in Composition-graded GaMnAsP Films.** *K. Lee*[1], K. Han[1], S. Lee[1], X. Liu[2], M. Dobrowolska[2] and J. Furdyna[2] *1. Physics Department, Korea University, Seoul, The Republic of Korea; 2. Physics Department, University of Notre Dame, Notre Dame, IN, United States*

EPB-13. **Laser assisted current induced magnetization switching in a TbCo/Pt hetero-structure wire.** *S. Sumi*[1], S. Ranjbar[1], K. Tanabe[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

EPB-14. **Metadynamics Calculations of Skyrmion Free-Energy Landscapes.** *I. Charalampidis*[1] and J. Barker[1] *1. Physics and Astronomy, University of Leeds, Leeds, United Kingdom*

Session FOA
SPIN DYNAMICS
Lakhan Bainsla, Chair
University of Gothenburg, Gothenburg, Sweden

FOA-01. **Laser-induced terahertz wave emission from Bi/Co structure.** *K. Ishibashi*[1,2], S. Iihama[3,2] and S. Mizukami[2,4]
1. Department of Applied Physics, Tohoku University, Sendai, Japan; 2. WPI-AIMR, Tohoku Univ., Sendai, Japan; 3. FRIS, Tohoku Univ., Sendai, Japan; 4. CSIS, Tohoku Univ., Sendai, Japan

FOA-02. **Spin Hall oscillators based on ferromagnetic metal/lithium aluminum ferrite bilayers with enhanced output power and quality factor.** *H. Ren*[4], X. Zheng[1], S. Channa[2], G. Wu[4], D.A. O'Mahoney[3], Y. Suzuki[1] and A.D. Kent[4]
1. Department of Applied Physics, Stanford University, Stanford, CA, United States; 2. Department of Physics, Stanford University, Stanford, CA, United States; 3. Department of Materials Science and Engineering, Stanford University, Stanford, CA, United States; 4. Center for Quantum Phenomena, Department of Physics, New York University, New York, NY, United States

FOA-03. **Spin Dynamics of Ferrimagnets Jointing Ferro- and Antiferromagnets.** *M. Guo*[1], H. Zhang[2] and R. Cheng[2,1]
1. Physics and Astronomy, University of California, Riverside, Riverside, CA, United States; 2. Electrical and Computer Engineering, University of California, Riverside, Riverside, CA, United States

FOA-04. **Spin and vorticity transport in two-dimensional magnets with easy-plane anisotropy.** *A.A. Kovalev*[1], E. Schwartz[1], M. Ali[1], H. Vakilitaleghani[1] and B. Li[1] *1. Physics and Astronomy, Department of Physics and Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, Lincoln, NE, United States*

FOA-05. **FMR-driven magnetization dynamics in epitaxial $Fe_{75}Co_{25}$ films interfaces with Bi_2Te_3.** *R. Nepal*[1], V. Sharma[1], E.A. Pogue[2] and R. Budhani[1] *1. Physics, Morgan State University, Baltimore, MD, United States; 2. Chemistry, John Hopkins University, Baltimore, MD, United States*

FOA-06. **Relating magnon propagation length to magnetic anisotropy and Gilbert damping in ferrimagnetic insulator/heavy metal heterostructures.** A. Chanda[1], C. Holzmann[2], M. Albrecht[2], C.A. Ross[3], M. Phan[1] and *H. Srikanth*[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Institute of Physics, University of Augsburg, Augsburg, Germany; 3. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

FOA-07. **Purely current-driven writing mechanism for domain wall-based recording devices.** D. Osuna Ruiz[1], *E. Martinez*[1], Ó. Alejos[2] and V. Raposo[1] *1. Applied Physics, University of Salamanca, Salamanca, Spain; 2. Electricity and Electronics, University of Valladolid, Valladolid, Spain*

FOA-08. **Withdrawn**

FOA-09. **Anomalous Nernst effect in epitaxially grown $Fe_{4-x}Ni_xN$ films.** *W. Yin*[1], K. Ito[1], Y. Tsubowa[2], M. Tsujikawa[2], M. Shirai[2] and K. Takanashi[1,3] *1. Institute for Materials Research, Tohoku University, Sendai, Japan; 2. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 3. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan*

FOA-10. **Anomalous Nernst effect in semiconductor / ferromagnetic metal multilayer.** *M. Mizuguchi*[1], R. Kitaura[2], H. Sharma[3], T. Ishibe[2] and Y. Nakamura[2] *1. Nagoya University, Nagoya, Japan; 2. Osaka University, Toyonaka, Japan; 3. IMEC, Leuven, Belgium*

FOA-11. **Mode transition from localized to propagating wave in perpendicular magnetic anisotropy-based spin-Hall oscillators.** M. Succar[1] and *M. Haidar*[1] *1. Physics, American University of Beirut, Beirut, Lebanon*

FOA-12. **Spin Dependent Photocurrent Generation in Germanene-like Structure.** *T. Nishijima*[1], S. Kawa[1], Y. Ando[1], A. Ohta[2], J. Yuhara[2], M. Kurosawa[2], E. Shigematsu[1], R. Ohshima[1] and M. Shiraishi[1] *1. Department of Electronic Science and Engineering, Kyoto University, Kyoto, Japan; 2. Graduate School of Engineering, Nagoya University, Nagoya, Japan*

FOA-13. **Single Molecular Magnet (SMM) Producing Photovoltaic Effect(PV) on Magnetic Tunnel Junction.** *M. Savadkoohi*[1,2], D.B. Gopman[2] and P. Tyagi[1] *1. Mechanical Engineering, University of District of Columbia, DC, WA, United States; 2. Materials Science and Engineering Division, National Institute of Standard and Technology(NIST), Gaithersburg, MD, United States*

FOA-14. **Theory of a Single Si Vacancy in SiC as a Quantum Sensor of Magnetic Fields.** *D. Fehr*[1] and M.E. Flatté[1] *1. Department of Physics and Astronomy, University of Iowa, Iowa City, IA, United States*

FOA-15. **Magnon-mediated entanglement of solid-state spin qubits.** *D.R. Candido*[1], M. Fukami[2], D. Awschalom[2,3] and M.E. Flatté[1,4] *1. Department of Physics and Astronomy and Optical Science and Technology Center, University of Iowa, Iowa City, IA, United States; 2. Pritzker School of Molecular Engineering, University of Chicago, Chicago, IL, United States; 3. Center for Molecular Engineering and Materials Science Division, Argonne National Lab, Lemont, IL, United States; 4. Department of Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

Session FOB
SPIN HALL AND SPIN-ORBIT TORQUE I
Simranjeet Singh, Chair
Carnegie Mellon University, Pittsburgh, PA, United States

FOB-01. **Clarifying the Origin of Charge-to-Spin Conversion in Ferromagnets.** ***(Invited)*** *Y. Hibino*[1], T. Taniguchi[1], K. Yakushiji[1], A. Fukushima[1], H. Kubota[1] and S. Yuasa[1] *1. Research Center for Emerging Computational Technologies, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

FOB-02. **Large interfacial Rashba interaction and giant spin-orbit torque in atomically thin metallic multilayers.** S. Krishnia[1], Y. Sassi[1], F. Ajejas[1], S. Collin[1], A. Fert[1], J. George[1], N. Reyren[1], H. Jaffres[1] and *V. Cros*[1] *1. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, 91767, Palaiseau, France, Palaiseau, France*

FOB-03. **Origin of transverse voltages generated by thermal gradients and electric fields in ferrimagnetic-insulator/heavy-metal bilayers.** *A. Bose*[1,2], R. Jain[2], J.J. Bauer[3], R. Buhrman[2], C.A. Ross[3] and D.C. Ralph[2] *1. Physics, Johannes Gutenberg University of Mainz, Mainz, Germany; 2. Physics, Cornell University, Ithaca, NY, United States; 3. Material Science, Massachusetts Institute of Technology, Cambridge, MA, United States*

FOB-04. **Topological Insulator Spin Orbit-Torque Enhancement via Insertion Layer and Crystallinity Control of BiSb(012).** *H. Poh*[1], S. Lee[1], C. Ang[1], T. Jin[1], G. Lim[1] and W. Lew[1] *1. School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*

FOB-05. **Growth-dependent Interlayer Chiral Exchange and Field-free Switching.** *Y. Huang*[1], C. Huang[1], W. Liao[1], T. Chen[1] and C. Pai[1,2] *1. Department of material science and engineering, National Taiwan University, Taipei, Taiwan; 2. Center of Atomic Initiative for New Materials, National Taiwan University, Taipei, Taiwan*

FOB-06. **Spin-orbit torques in RuO_2/Co-Fe-B bilayer.** *T. Nguyen*[1,2], S. DuttaGupta[1,3], Y. Saito[1], S. Fukami[3,1], D. Vu[4], H. Naganuma[2,1], S. Ikeda[2,1], T. Endoh[2,5] and Y. Endo[5,1] *1. Center for Science and Innovation in Spintronics, Tohoku University, Sendai, Japan; 2. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan; 3. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 4. Institute of Physics, Vietnam Academy of Science and Technology, Hanoi, Vietnam; 5. Graduate School of Engineering, Tohoku University, Sendai, Japan*

FOB-07. **Enhancing Spin-Orbit Torque Efficiency via Orbital Currents.** *C. Hu*[1], Y. Chiu[1], C. Tsai[1], C. Huang[1], K. Chen[1], C. Peng[1], C. Lee[2], M. Song[2], Y. Huang[2], S. Lin[2] and C. Pai[1] *1. National Taiwan University, Taipei, Taiwan; 2. Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan*

FOB-08. **Spin-orbit torque driven perpendicular magnetization switching in Re/CoFeB/MgO with high thermal stability.** *A. Ranjan*[1] *1. Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan*

FOB-09. **Spin-to-charge conversion at cryogenic temperatures in the chiral antiferromagnet Mn_3Sn interfaced with a metallic ferromagnet.** *V. Sharma*[1], R. Nepal[1], H. Kaur[1] and R. Budhani[1] *1. Department of Physics, Morgan State University, Baltimore, MD, United States*

FOB-10. **Spin-orbit Torque Study on MBE-grown $Bi_{1-x}Sb_x$ Thin Films.** *Y. Ou*[1], W. Yanez[1], Y. Huang[1], S. Ghosh[2], C. Sahin[3], M. Stanley[1], A. Richardella[1], M.E. Flatté[4], A. Mkhoyan[2] and N. Samarth[1] *1. Department of Physics, The Pennsylvania State University, State College, PA, United States; 2. Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 3. Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, Turkey; 4. Department of Physics and Astronomy, University of Iowa, Iowa City, IA, United States*

FOB-11. **Large Spin Hall Effects in a Model Epitaxial $BaPb_{1-x}Bi_xO_3$ / $La_{0.7}Sr_{0.3}MnO_3$ System.** *I. Harris*[1], A. Edgeton[2], X. Huang[1], R. Yalisove[1], G. Fratian[1], M. Mazur[3], L. Caretta[1], S. Susarla[4,1], C. Eom[2], D.C. Ralph[3] and R. Ramesh[1] *1. University of California, Berkeley, Berkeley, CA, United States; 2. University of Wisconsin, Madison, Madison, WI, United States; 3. Cornell University, Ithaca, NY, United States; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

FOB-12. **Experimental study and first principles calculation of the spin Hall Effect in $La_{0.67}Sr_{0.33}MnO_3$.** *I. Park*[1], T. Mabe[1], P. Gupta[2], A. Mishra[2], A. Swain[2], S. Bedanta[2] and V.P. Amin[1] *1. Physics, Indiana University - Purdue University, Indianapolis, Indianapolis, IN, United States; 2. School of Physical Sciences, National Institute of Science Education and Research, Jatani, India*

ORAL SESSIONS

Session FOC

SPIN HALL AND SPIN-ORBIT TORQUE II

Yongxi Ou, Chair

The Pennsylvania State University, State College, PA, United States

FOC-01. **Gate-Tuneable and Chirality-Dependent Charge-to-Spin Conversion in Tellurium Nanowires.** ***(Invited)*** *M. Gobbi*[1,2], F. Calavalle[1], M. Suárez-Rodríguez[1], B. Martín-García[1], A. Johansson[3], D.C. Vaz[1], H. Yang[1], I. Maznichenko[3], S. Ostanin[3], A. Mateo-Alonso[4,2], A. Chuvilin[1,2], I. Mertig[3], F. Casanova[1,2] and L.E. Hueso[1,2] *1. CIC nanogune BRTA, Donostia - San Sebastian, Spain; 2. Ikerbasque, Basque Foundation for Science, Bilbao, Spain; 3. Institute of Physics, Martin Luther University Halle-Wittenberg, Halle, Germany; 4. POLYMAT, University of the Basque Country UPV/EHU, Donostia - San Sebastian, Spain*

FOC-02. **Detection of spatial spin distribution in a strong Rashba channel at room temperature.** *S. Kim*[1,2], W. Lee[3], K. Kim[2], K. Lee[3], G. Choi[4,5] and H. Koo[1,2] *1. KU-KIST Graduate School of Converging Science and Technology, Korea University, Seongbuk-gu, The Republic of Korea; 2. Center for Spintronics, Korea Institute of Science and Technology, Seongbuk-gu, The Republic of Korea; 3. Department of Physics, Korea Advanced Institute of Science and Technology, Yuseong-gu, The Republic of Korea; 4. Department of Energy Science, Sungkyunkwan University, Suwon, The Republic of Korea; 5. Center for Integrated Nanostructure Physics, Institute for Basic Science (IBS), Suwon, The Republic of Korea*

FOC-03. **Anomalous Hall Effect and Exotic Torques in Non-Collinear Antiferromagnet Mn3Pt.** *R. Klause*[1], S. Siddiqui[2] and A. Hoffmann[1] *1. Department of Materials Science and Engineering and Materials Research Laboratory, University of Illinois Urbana Champaign, Urbana, IL, United States; 2. Intel Corporation, Hillsboro, OR, United States*

FOC-04. **Effect of seed layer thickness on Ta crystalline phase and spin Hall angle.** K. Sriram[1], J. Pala[1], B. Paikaray[1], A. Haldar[2] and *C. Murapaka*[1] *1. Materials Science and Metallurgical Engineering, Indian Institute of Technology Hyderabad, Sangareddy, India; 2. Department of Physics, Institute of Technology Hyderabad, Sangareddy, India*

FOC-05. **High-throughput study of spin and orbital transport in magnetic materials.** *Y. Yahagi*[1,2] and J. Zelezny[3] *1. Applied Physics, Tohoku University, Sendai, Japan; 2. NEC-AIST Quantum Technology Cooperative Research Laboratory, NEC Corporation, Tsukuba, Japan; 3. Institute of Physics, Czech Academy of Science, Prague, Czechia*

FOC-06. **Tuning Spin-Orbit Torque Efficiencies of Pt via Sub-monolayer Insertions of Cr and Cu.** *W. Janssens*[1,2], G. Talmelli[2], K. Cai[2], R. Carpenter[2], J. De Boeck[1,2], G.S. Kar[2] and S. Couet[2] *1. Department of Electrical Engineering, KU Leuven, Leuven, Belgium; 2. imec, Leuven, Belgium*

FOC-07. **Anatomy of Type-*x* Spin-Orbit Torque Switching: 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. Department of Material Science and Engineering, National Taiwan University, Taipei, Taiwan; 2. Center of Atomic Initiative for New Materials, National Taiwan University, Taipei, Taiwan*

FOC-08. **Efficient generation of spin currents by the orbital Hall effect in Cu and Al.** *A. Rothschild*[1], N. Am-Shalom[1], N. Bernstein[1], M. Meron[1], T. David[1], E. Frohlich[1], B. Assouline[1], J. Xiao[2], B. Yan[2] and A. Capua[1] *1. The Hebrew University of Jerusalem, Jerusalem, Israel; 2. Weizmann Institute of Science, Rehovot, Israel*

FOC-09. **Spurious symmetric voltage signals on the spin torque ferromagnetic resonance measurement induced by oxide substrates.** *G. Ji*[1], Y. Chai[1], D. Jiang[1], H. Chen[2], D. Yi[2] and T. Nan[1] *1. School of Integrated Circuits and Beijing National Research Center for Information Science and Technology, Tsinghua University, Beijing, China; 2. Material Science and Technology, Tsinghua University, Beijing, China*

FOC-10. **Synchronization of Spin-Torque Nano-Oscillators.** *F. Ai*[1,2] and V. Lomakin[1,2] *1. University of California, San Diego, La Jolla, CA, United States; 2. Center for Memory and Recording Research, La Jolla, CA, United States*

FOC-11. **Interfacial and bulk spin-Hall contributions to field-like spin-orbit torque generated by Iridium.** *S. Dutta*[1], A. Bose[2], A. Tulapurkar[1], R. Buhrman[3] and D.C. Ralph[4] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India; 2. Physics, Institute of Physics, Johannes Gutenberg University of Mainz, Mainz, Germany; 3. Applied & Engineering Physics, Cornell University, Ithaca, NY, United States; 4. Physics, Cornell University, Ithaca, NY, United States*

FOC-12. **Helium Ion Microscopy for Deterministic Multi-level SOT switching.** J. Kurian[1], *A. Joseph*[1], G. Hlawacek[2], S.C. Hertel[1], C. Fowley[2], P. Dunne[1], G. Atcheson[3], M. Venkatesan[3], J.M. Coey[3] and B. Doudin[1] *1. IPCMS UMR 7504, Université de Strasbourg, CNRS, Strasbourg, France; 2. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden - Rossendorf, Dresden, Germany; 3. AMBER and School of Physics, Trinity College, Dublin, Ireland*

ORAL SESSIONS

Session FOD
SPIN TRANSPORT

Bhaskaran Muralidharan, Co-Chair
Indian Institute of Technology, Bombay, India
Yuki Hibino, Co-Chair
National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

FOD-01. **Giant Spin-valve Effect in Oxide-based Lateral Nano-scale Channel Devices.** ***(Invited)*** *T. Endo*[1], S. Tsuruoka[1], S. Kaneta-Takada[1], L. Anh[1,2], S. Ohya[1,2] and M. Tanaka[1,2] *1. Department of Electrical Engineering and Information Systems, The University of Tokyo, Bunkyo, Japan; 2. Center for Spintronics Research Network, The University of Tokyo, Bunkyo, Japan*

FOD-02. **Long-distance spin transport in strained SiGe.** *T. Naito*[1], M. Yamada[2,3], Y. Wagatsuma[4], K. Sawano[4] and K. Hamaya[3,5] *1. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 2. PRESTO, JST, Kawaguchi, Japan; 3. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 4. Advanced Research Laboratories, Tokyo City University, Setagaya, Japan; 5. Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan*

FOD-03. **Spin Transport in Mg-based Nonlocal Spin Valves.** *J. Ramberger*[1], B. Kaiser[1], J.E. Dewey[1] and C. Leighton[1] *1. Department of Chemical Engineering and Materials Science, University of Minnesota - Twin Cities, Minneapolis, MN, United States*

FOD-04. **Room temperature spin signals improved by low-temperature annealing in $Co_2MnSi/Fe/Ge$ lateral spin-valve devices.** *M. Yamada*[1,2], K. Sumi[3], T. Naito[3], K. Sawano[4] and K. Hamaya[2,5] *1. PRESTO, JST, Kawaguchi, Japan; 2. Center for Spintronics Research Network, Osaka University, Toyonaka, Japan; 3. Graduate School of Engineering Science, Osaka University, Toyonaka, Japan; 4. Advanced Research Laboratories, Tokyo City University, Setagaya, Japan; 5. Institute for Open and Transdisciplinary Research Initiatives, Osaka University, Suita, Japan*

FOD-05. **Epitaxial growth of Sn-doped Mn_4N films and their magneto-transport properties at room temperature.** *T. Yasuda*[1], T. Komori[1], T. Hirose[1], T. Horiuchi[1], K. Toko[1] and T. Suemasu[1] *1. Univ. of Tsukuba, Tsukuba, Japan*

FOD-06. **Underlying Mechanism of the Driving Force for Generating Spin Currents Thermally in a Ferrimagnetic Insulator Due to a Temperature Gradient.** *M. Imamura*[1], H. Asada[2], Y. Kano[1], R. Matsuda[1], D. Tashima[1] and J. Kitagawa[1] *1. Fukuoka Institute of Technology, Fukuoka, Japan; 2. Yamaguchi University, Ube, Japan*

FOD-07. **Enhanced Spin Signal in Metallic Non-Local Spin Valves with Highly-Spin-Polarized $Co_{1-x}Fe_x$ Injectors/Detectors.** *B. Kaiser*[1], J.D. Watts[1,2], J. Ramberger[1], J.E. Dewey[1] and C. Leighton[1] *1. Chemical Engineering and Material Science, University of Minnesota - Twin Cities, Minneapolis, MN, United States; 2. Physics and Astronomy, University of Minnesota - Twin Cities, Minneapolis, MN, United States*

FOD-08. **Highly tunable spin Hall magnetoresistance in room-temperature magnetoelectric multiferroic, $Sr_3Co_2Fe_{24}O_{41}$|Pt hybrids.** A.A. Wagh[1], *P. Garg*[1], K. Mallick[1], S. Elizabeth[1] and P. Kumar[1] *1. Physics, Indian Institute of Science, Bangalore, Bangalore, India*

FOD-09. **Electron and Spin Transport in an Ultrathin Al Film for Use as a Nonlocal Spin Valve.** *Y. Liu*[1] and R.H. Victora[1,2] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

FOD-10. **Electrical detection of magnetization of a layered semiconducting ferromagnet using WTe_2.** *I. Kao*[1], S. Yuan[1], J. Katoch[1] and S. Singh[1] *1. Department of Physics, Carnegie Mellon University, Pittsburgh, PA, United States*

FOD-11. **Non-local measurement as a probe of the spin Hall effect in topological insulators.** *G.M. Stephen*[1], A. Hanbicki[1], J. DeMell[1], P. Taylor[2], O. Vail[2], J. Robinson[4], T. Schumann[3], S. Stemmer[3] and A. Friedman[1] *1. Laboratory for Physical Sciences, College Park, MD, United States; 2. Army Research Lab, Adelphi, MD, United States; 3. University of California Santa Barbara, Santa Barbara, CA, United States; 4. Naval Research Lab, Washington D.C., DC, United States*

Session FPA
SPIN CURRENT AND DYNAMICS (Poster Session)

Lucas Caretta, Chair
Brown University, Providence, RI, United States

FPA-01. **Giant spin Hall effect and spin-orbit torques from 5*d* transition metal - aluminum alloys for energy efficient synthetic antiferromagnetic racetrack memories.** *P. Wang*[1] and S. Parkin[1] *1. NISE, Max Planck Institute for Microstructure Physics, Halle, Germany*

FPA-02. **Enhanced charge-to-spin efficiency for modified tungsten-based-SOT channel.** *S. Lu*[1], X. Ma[1], J. Yin[1], X. Ning[1], H. Zhang[1], X. Shang[2], T. Xu[2], H. Sun[2], C. Zhang[2], B. Man[2], S. Li[2], D. Li[2], S. Lyu[2], W. Chen[2], G. Wang[2], W. Zhao[1], K. Cao[1] and H. Liu[2] *1. Fert Beijing Institute, School of Integrated Science and Engineering, Truth Memory Tech, Beijing, China; 2. Truth Memory Tech, Beijing, China*

FPA-03. **Anomalous inverse spin Hall effect in perpendicular magnetized Co/Pd multilayers.** *M. Yang*[1], B. Miao[1], J. Cheng[1], K. He[1], X. Yang[1], Y. Zeng[1], Z. Wang[1], L. Sun[1], X. Wang[2,3], A. Azevedo[4], S. Bedanta[5] and H. Ding[1] *1. Department of Physics, Nanjing University, Nanjing, China; 2. Physics Department, The Hongkong University of Science and Technology, Kowloon, Hong Kong; 3. PHKUST Shenzhen Research Institute, Shenzhen, China; 4. Departamento de Física, Universidade Federal de Pernambuco, Recife, Brazil; 5. Laboratory for Nanomagnetism and Magnetic Materials (LNMM), National Institute of Science Education and Research (NISER), Jatni, India*

FPA-04. **A coherent picture on the pure spin transport between Ag/Bi and ferromagnets.** *J. Cheng*[1], B. Miao[1], Z. Liu[2], M. Yang[1], K. He[1], Y. Zeng[1], H. Niu[1], X. Yang[1], Z. Wang[1], X. Hong[1], S. Fu[1], L. Sun[1], Y. Liu[2], Y. Wu[3], Z. Yuan[2] and H. Ding[1] *1. Physics, Nanjing University, Nanjing, China; 2. Center for Advanced Quantum Studies and Department of Physics, Beijing Normal University, Beijing, China; 3. Physics, Fudan University, Shanghai, China*

FPA-05. **Magnetic field dependence of mV class spin motive force due to domain wall motion in GdFeCo magnetic wire.** *M. Oikawa*[1], S. Kambe[1], S. Sumi[1], K. Tanabe[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

FPA-06. **Absence of cross-sublattice spin pumping and spin torques in collinear antiferromagnets: symmetry and microscopic theory.** *J. Tang*[1] and R. Cheng[2,1] *1. Department of Physics and Astronomy, University of California, Riverside, Riverside, CA, United States; 2. Department of Electrical and Computer Engineering, University of California, Riverside, Riverside, CA, United States*

FPA-07. **High Frequency Spin Torque Oscillation in Orthogonal Magnetization Disks with Strong Biquadratic Magnetic Coupling.** *L. Chuhan*[1], Y. Kurokawa[1], N. Hashimoto[1], T. Tanaka[1] and H. Yuasa[1] *1. Kyushu University, Fukuoka, Japan*

FPA-08. **Novel Phase Formation and Magnetism at the Sb_2Te_3/ $Ni_{80}Fe_{20}$ Interface.** *A.R. Will-Cole*[1], J. Hart[2], A. Podpirka[3], M. Matzelle[4], N. Bhattacharjee[1], S. Patel[5], S.H. Tolbert[5], A. Bansil[4], J.J. Cha[2], D. Heiman[4] and N. Sun[1] *1. Electrical Engineering, Northeastern University, Boston, MA, United States; 2. Materials Science and Engineering, Cornell University, Ithaca, NY, United States; 3. Johns Hopkins Applied Physics Laboratory, Laurel, MD, United States; 4. Physics, Northeastern University, Boston, MA, United States; 5. Chemistry, University of California Los Angeles, Los Angeles, CA, United States*

FPA-09. **Withdrawn**

FPA-10. **Enhanced spin pumping in CoFeB/Ta/Ni heterostructure by temperature induced Ni → NiO interface.** P. Kumar[1,2], V. Sharma[2], R. Kumar[2], M.K. Khanna[3] and *B.K. Kuanr*[2] *1. Department of Electronic Science, University of Delhi, South Campus, New Delhi, India; 2. Special Centre for Nanoscience, Jawaharlal Nehru University, New Delhi, India; 3. Ramjas College, University of Delhi, New Delhi, India*

FPA-11. **Local spin Seebeck effect on polycrystalline YIG/ thermally evaporated chromium bilayers.** *S. Bleser*[1], R. Greening[1], X. Fan[1] and B. Zink[1] *1. University of Denver, Denver, CO, United States*

FPA-12. **Study of Cobalt-Based Spin Gapless Semiconducting Heusler Alloy Thin Film.** *S. Nadeem*[1], S. Amara[1], D. Khan[1], S. Chaudhary[2] and Y. Massoud[1] *1. Computer, Electrical and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 2. Department of Physics, Indian Institute of Technology, Dehli, India*

FPA-13. **Large spin current generation from the Rashba surface at Ti/Pt interface.** *S. Dutta*[1] and A. Tulapurkar[1] *1. Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India*

FPA-14. **Study of Spin Orbit Torque in $PtSe_2$/NiFe/Pt Heterostructure.** *R. Mudgal*[1], A. Jakhar[2], P. Gupta[1], H. Bangar[1], N. Chowdhury[1], S. Das[2] and P.K. Muduli[1] *1. Department of Physics, Indian Institute of Technology Delhi, Delhi, India; 2. Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, Delhi, India*

FPA-15. **High Frequency (5 GHz – 40 GHz) Microwave Resonant Absorption and Inverse Spin Hall Effect in Py/Pt Thin Film stacking.** *S. Sahu*[1] and G. Basheed[1] *1. CSIR-National Physical Laboratory, New Delhi, India*

FPA-16. **Characteristics of Magnon-phonon Coupling in Magnetic Insulator based on Boltzmann equation.** *C. Chen*[1], Y. Li[1] and J. Zhang[1] *1. Tongji University, Shanghai, China*

ORAL SESSIONS

Session GOA

MAGNETIZATION DYNAMICS I

Vijaysankar Kalappattil, Chair
Colorado State University, Fort Collins, CO, United States

GOA-01. **Polarized phonons carry the missing angular momentum in femtosecond demagnetization.** ***(Invited)*** *U. Nowak*[1], M. Evers[1], H. Lange[1], S. Tauchert[2], M. Volkov[1] and P. Baum[2] *1. Department of Physics, University of Konstanz, Konstanz, Germany; 2. Deparment of Physics, LMU, Garching, Germany*

GOA-02. **Element specific ultrafast magnetization dynamics of strained NFO films using ultra short XUV pulses.** *S. Saha*[1,2], R. Knut[1], R.S. Malik[1], K. Jatkar[1], R. Stefanuik[1], J. Soderstrom[1], V. Kapaklis[1], C. Luo[3], F. Radu[3] and D. Arena[4] *1. Uppsala University, Uppsala, Sweden; 2. Ashoka University, Sonepat, India; 3. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 4. University of South Florida, Tampa, FL, United States*

GOA-03. **Withdrawn**

GOA-04. **Nonlinear evolution of nanoscale magnetic domains following ultrafast laser excitation.** *R. Jangid*[1], N.Z. Hagström[2], M. Madhavi[1], J.M. Shaw[5], J. Brock[4,8], M. Pancaldi[3], F. Capotondi[3], E. Pedersoli[3], H. Nembach[5], S. Bonetti[2,6], E. Fullerton[4], M.W. Keller[5], R. Kukreja[1], E. Iacocca[7] and T.J. Silva[5] *1. Department of Materials Science and Engineering, University of California Davis, Davis, CA, United States; 2. Department of Physics, Stockholm University, Stockholm, Sweden; 3. Elettra-Sincrotrone Trieste S.C.p.A., Trieste, Italy; 4. Center for Memory and Recording Research, University of California San Diego, La Jolla, CA, United States; 5. Quantum Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO, United States; 6. Department of Molecular Sciences and Nanosystems, Ca' Foscari University of Venice, Venezia, Italy; 7. Center for Magnetism and Magnetic Materials, University of Colorado Colorado Springs, Colorado Springs, CO, United States; 8. Paul Scherrer Institute, Villigen, Swaziland*

GOA-05. **Withdrawn**

GOA-06. **All Optical Switching of Antiferromagnetic Domains.** *H. Meer*[1], S. Wust[2], C. Schmitt[1], P. Herrgen[2], F. Fuhrmann[1], B. Bednarz[1], A. Rajan[1], R. Ramos[6,7], M. Foerster[3], M. Niño[3], F. Kronast[4], A. Kleibert[5], E. Saitoh[6,8], B. Stadtmüller[1,2], M. Aeschlimann[2] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 2. Department of Physics and Research Center OPTIMAS, Universität Kaiserslautern, Mainz, Germany; 3. ALBA Synchrotron Light Facility, Barcelona, Spain; 4. Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany; 5. Swiss Light Source, Paul Scherrer Institut, Villingen, Switzerland; 6. WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; 7. Departamento de Química-Física, Universidade de Santiago de Compostela, Centro de Investigación en Química Biolóxica e Materiais Moleculares (CIQUS), Santiago de Compostela, Spain; 8. Department of Applied Physics, The University of Tokyo, Tokyo, Japan*

GOA-07. **Robust toggle switching in Tb-based multilayers by a single-shot laser pulse.** *Y. Peng*[1], D. Salomoni[2], G. Malinowski[1], L.D. Buda-Prejbeanu[2], R. Sousa[2], L. Prejbeanu[2], J. Hohlfeld[1], M. Verges[1], S. Mangin[1] and M. Hehn[1] *1. Institut Jean Lamour, UMR CNRS 7198, Université de Lorraine, Nancy, France; 2. Spintec, Université Grenoble Alpes, CNRS, CEA, Grenoble INP, IRIG-SPINTEC, Grenoble, France*

GOA-08. **Generation of Large Spin Current Burst during Magnetic Phase Transition of FeRh.** T. Lee[1], M. Park[2], S. Kim[1], M. Jung[2] and *K. Kim*[1] *1. Physics, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Physics, Sogang University, Seoul, The Republic of Korea*

GOA-09. **Symmetry-dependent ultrafast manipulation of nanoscale magnetic domains.** *N. Zhou Hagström*[1], R. Jangid[2], M. Madhavi[2], D. Turenne[3], J. Brock[4], E.S. Lamb[5], B. Stoychev[5], J. Schlappa[6], N. Gerasimova[6], B. Van Kuiken[6], R. Gort[6], L. Mercadier[6], L. Le Guyader[6], A. Samartsev[6], A. Scherz[6], G. Mercurio[6], H.A. Dürr[3], A.H. Reid[7], M. Arora[8], H. Nembach[8,9], J.M. Shaw[8], E. Jal[10], E. Fullerton[4], M.W. Keller[8], R. Kukreja[2], S. Bonetti[1,11], T.J. Silva[8] and E. Iacocca[13,12] *1. Department of Physics, Stockholm University, Stockholm, Sweden; 2. Materials Science and Engineering, University of California, Davis, Davis, CA, United States; 3. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; 4. Center for Memory and Recording Research, University of California, San Diego, La Jolla, CA, United States; 5. Department of Physics, University of California, San Diego, La Jolla, CA, United States; 6. European XFEL GmbH, Schenefeld, Germany; 7. Linac Coherent Light Source, SLAC National Accelerator Laboratory, Menlo Park, CA, United States; 8. National Institute of Standards and Technology, Boulder, CO, United States; 9. Department of Physics, University of Colorado, Boulder, Boulder, CO, United States; 10. LCPMR, Sorbonne Université, Paris, Finland; 11. Department of Molecular Sciences and Nanosystems, Ca' Foscari University of Venice, Venice, Italy; 12. Department of Mathematics, Physics and Electrical Engineering, Northumbria University, Newcastle upon Tyne, United Kingdom; 13. Center for Magnetism and Magnetic Materials, University of Colorado, Colorado Springs, Colorado Springs, CO, United States*

GOA-10. **Determination of sub-ps lattice dynamics in FeRh thin films.** *M. Grimes*[1,2], H. Ueda[2], D. Ozerov[2], F. Pressacco[4], S. Parchenko[5], A. Apseros[2,3], M. Scholz[4], Y. Kubota[6], T. Togashi[6,7], Y. Tanaka[6], L. Heyderman[2,3], T. Thomson[1] and V. Scagnoli[2,3] *1. University of Manchester, Manchester, United Kingdom; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. ETH Zurich, Zurich, Switzerland; 4. DESY, Hamburg, Germany; 5. European XFEL, Hamburg, Germany; 6. RIKEN, Hyogo, Japan; 7. JASRI, Hyogo, Japan*

GOA-11. **Asynchronous switching of rare-earth and transition-metal sublattices in ferrimagnetic alloys induced by spin-orbit torques.** ***(Invited)*** *G. Sala*[1], C. Lambert[1], S. Finizio[2], V. Raposo[3], V. Krizakova[1], G. Krishnaswamy[1], M. Weigand[4], J. Raabe[2], M. Rossel[5], E. Martinez[3] and P. Gambardella[1] *1. ETH Zurich, Zürich, Switzerland; 2. Paul Scherrer Institut, Villigen, Switzerland; 3. University of Salamanca, Salamanca, Spain; 4. Max Planck Institute for Intelligent Systems, Stuttgart, Germany; 5. Electron Microscopy Center, EMPA, Dübendorf, Switzerland*

Session GOB
MAGNETIZATION DYNAMICS II

Ezio Iacocca, Chair
University of Colorado Colorado Springs, Colorado Springs, CO, United States

GOB-01. **Magnonic interferometer's leaky-mode influence on spin-wave beam reflection.** *K. Sobucki*[1], W. Smigaj[2], P. Graczyk[3], M. Krawczyk[1] and P. Gruszecki[1] *1. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 2. Met Office, Exeter, United Kingdom; 3. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland*

GOB-02. **Spectroscopy and mlcroscopy of propagating spin-waves in a synthetic anti-ferromagnet by Brillouin Light Scattering.** *J. Adam*[1], F. Millo[1], S. Ngom[1], A. Mouhoub[1], J. Kim[1], C. Chappert[1], A. Solignac[2] and T. Devolder[1] *1. Université Paris-Saclay/CNRS, Palaiseau, France; 2. SPEC / CEA/ CNRS /Université Paris-Saclay, Gif-sur-Yvette, France*

GOB-03. **Electrical Detection of Short-Wavelength Nonreciprocal Magnons in Magnetic Thin Film Device.** *Y. Li*[1], T. Lo[2], J. Qian[2], Z. Jiang[2], J. Pearson[1], R. Divan[3], A. Schleife[2], W. Pfaff[4], J. Zuo[2], U. Welp[1], W. Kwok[1], A. Hoffmann[2] and V. Novosad[1] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Materials Science Engineering, University of Illinois at Urbana Champaign, Urbana, IL, United States; 3. Center for Nanoscale Materials, Argonne National Laboratory, Lemont, IL, United States; 4. Department of Physics, University of Illinois at Urbana Champaign, Urbana, IL, United States*

GOB-04. **Magnetoelectric transducers for spin wave.** *F. Ciubotaru*[1], D. Narducci[1,2], M. Geilen[3], F. Vanderveken[1,2], B. Heinz[3], G. Talmelli[1], B. Hillebrands[3], J. De Boeck[1], P. Pirro[3] and C. Adelmann[1] *1. imec, Leuven, Belgium; 2. KU Leuven, Leuven, Belgium; 3. Technische Universität Kaiserslautern, Kaiserslautern, Germany*

GOB-05. **Measuring a Population of Spin Waves from the Electrical Noise of an Inductively Coupled Antenna.** *T. Devolder*[1], S. Ngom[1], A. Mouhoub[1], J. Létang[1], J. Kim[1], P. Crozat[1], J. Adam[1], A. Solignac[2] and C. Chappert[1] *1. Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, Palaiseau, France; 2. SPEC, CEA, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France*

GOB-06. **Inelastic spin-scattering of confined magnons in magnetic interfaces by electrons.** *J.A. do Nascimento*[1] and V. Lazarov[1] *1. Physics, University of York, York, United Kingdom*

GOB-07. **Withdrawn**

GOB-08. **Control of the spin-wave spectra by magnetic field orientation and magnitude in crescent-shape ferromagnetic nanorods.** *H. Reshetniak*[1], N.B. Lesniewski[1], U. Makartsou[1], M. Golebiewski[1], M. Moalic[1], P. Gruszecki[1] and M. Krawczyk[1] *1. Faculty of Physics, Adam Mickiewicz University, Institute of Spintronics and Quantum Information, Poznan, Poland*

GOB-09. **Excitation of short-wavelength propagating spin waves in thin YIG film waveguides.** *S. Louis*[1], C. Liu[2], J. Xu[3], C. Trevillian[4], V. Kalappattil[2], D.B. Gopman[5], D. Jin[3], J.M. Shaw[6], H. Nembach[7], V. Tyberkevych[4], X. Zhang[3], A.N. Slavin[4] and M. Wu[2] *1. Electrical and Computer Engineering, Oakland University, Rochester, MI, United States; 2. Physics, Colorado State University, Fort Collins, CO, United States; 3. Consortium for Advanced Science and Engineering, University of Chicago, Chicago, IL, United States; 4. Physics, Oakland University, Rochester, MI, United States; 5. Materials Science Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, United States; 6. Nanoscale Spin Dynamics Group, National Institute of Standards and Technology, Boulder, CO, United States; 7. Spin Electronics Group, National Institute of Standards and Technology, Boulder, CO, United States*

GOB-10. **Tunable Magnonic Chern Bands and Chiral Spin Currents in Magnetic Multilayers.** *Z. Hu*[1], L. Fu[2] and L. Liu[1] *1. Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA, United States; 2. Department of Physics, Massachusetts Institute of Technology, Cambridge, MA, United States*

GOB-11. **Spin Wave Diffraction in Curvilinear Antennas.** *V. Vlaminck*[1,2], L. Temdie[1,2], V. Castel[1,2], M. Jungfleisch[3], M. Grassi[4], H. Majjad[5], R. Bernard[5], D. Stoeffler[5], Y. Henry[5] and M. Bailleul[5] *1. Microwave Dept., IMT Atlantique, Brest, France; 2. Lab-STICC, UMR 6285 CNRS, Brest, France; 3. Dept. of Physics and Astronomy, University of Delaware, Newark, DE, United States; 4. Uppsala University, Uppsala, Sweden; 5. IPCMS - UMR 7504 CNRS, Strasbourg, France*

GOB-12. **Low-Loss Nanoscopic Spin-Wave Guiding in Continuous YIG Films.** H. Qin[1], R. Holländer[1], L. Flajšman[1] and *S. van Dijken*[1] *1. Department of Applied Physics, Aalto University, Espoo, Finland*

ORAL SESSIONS

Session GOC
MAGNETIZATION DYNAMICS III
Steven Louis, Chair
Oakland University, Rochester, MI, United States

GOC-01. **Analog quantum control of magnonic cat states on-a-chip by a superconducting qubit.** *M. Kounalakis*[1], G. Bauer[2,1] and Y. Blanter[1] *1. Kavli Institute of Nanoscience, Delft University of Technology, Delft, Netherlands; 2. WPI-AIMR, Tohoku University, Sendai, Japan*

GOC-02. **Travelling Photons-Mediated Coherent and Dissipative Couplings in Long-distance Cavity Magnonics.** *Y. Yang*[1], P. Fong[3], H. Lau[3], W. Lu[2] and C. Hu[1] *1. Physics, University of Manitoba, Winnipeg, MB, Canada; 2. Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Shanghai, China; 3. Physics, Simon Fraser University, Burnaby, BC, Canada*

GOC-03. **Hybridizing antiferromagnetic magnons with spin pumping and exchange fields.** *M.M. Subedi*[1], Y. Xiong[2], M.T. Hossain[3], P. Meisenheimer[4], J. Heron[4], M. Jungfleisch[3], W. Zhang[2] and J. Sklenar[1] *1. Wayne State University, Detroit, MI, United States; 2. Oakland University, Rochester, MI, United States; 3. University of Delaware, Newark, DE, United States; 4. University of Michigan, Ann Arbor, MI, United States*

GOC-04. **Withdrawn**

GOC-05. **Complex Dynamics In Mutually Coupled Spin Torque Vortex Oscillators.** *K. Ho*[1], S. Wittrock[1,2], S. Perna[3], C. Serpico[3], P. Bortolotti[1], R. Lebrun[1] and V. Cros[1] *1. Unité Mixte de Physique CNRS, Thales, Université Paris-Saclay, Palaiseau, France; 2. Max Born Institute For Nonlinear Optics & Short Pulse Spectroscopy, Berlin, Germany; 3. Department of Electrical Engineering and ICT, University of Naples Federico II, Naples, Italy*

GOC-06. **Computational Capability of Physical Reservoir Computing in Spin Torque Oscillator with Two Free Layers.** *T. Yamaguchi*[1], S. Tsunegi[2] and T. Taniguchi[2] *1. Center for Emergent Matter Science (CEMS), Riken, Wako, Saitama, Japan; 2. Research Center for Emerging Computing Technologies, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan*

GOC-07. **Withdrawn**

GOC-08. **Spin Cavitronics System: from Strong to Ultra-Strong Coupling.** *G. Bourcin*[1], V. Castel[1] and V. Vlaminck[1] *1. IMT Atlantique, Brest, France*

GOC-09. **Bistability in Dissipatively Coupled Cavity Magnonics.** *H. Pan*[1,2], Y. Yang[2], Z. An[1] and C. Hu[2] *1. Department of Physics, Fudan University, Shanghai, China; 2. Department of Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada*

GOC-10. **Measurement Scheme for Single Magnon Decoherence.** *C. Trevillian*[1] and V. Tyberkevych[1] *1. Physics, Oakland University, Rochester, MI, United States*

GOC-11. **Imaging of biologically grown magnetic nanostructures by X-ray microscopy.** *T. Feggeler*[1], R. Meckenstock[2], D. Spoddig[2], B. Zingsem[2,3], J. Lill[2], D. Günzing[2], S. Wintz[4], M. Weigand[5], H. Wende[2], M. Farle[2], M. Winklhofer[6], K. Ollefs[2] and H. Ohldag[1,7] *1. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; 3. Ernst Ruska Center, Research Center Juelich, Juelich, Germany; 4. MPI Stuttgart, Stuttgart, Germany; 5. Helmholtz Center Berlin, Berlin, Germany; 6. School of Mathematics and Science, University of Oldenburg, Oldenburg, Germany; 7. Department of Material Sciences and Engineering, Stanford University, Stanford, CA, United States*

GOC-12. **Dynamic properties of magnetic nanoparticles in highly ordered arrangements: distance and frequency-dependent properties.** *N. Neugebauer*[1,2], Y. Wang[3], P. Marburger[1,2], T. Hache[4,5], A. Fabian[6,2], M. Czerner[6,2], D. Hofmann[1,2], H. Schultheiss[4,7], M. Elm[1,2], X. Ye[3], C. Heiliger[6,2] and P. Klar[1,2] *1. Institute of Experimental Physics I, Justus Liebig University, Giessen, Germany; 2. Center for Materials Research (LaMa), Justus Liebig University, Giessen, Germany; 3. Department of Chemistry, Indiana University, Bloomington, IN, United States; 4. Institute of Ion Beam Physics and Materials Research, Helmholtz-Center Dresden-Rossendorf, Dresden, Germany; 5. Institute for Physics, Technische University Chemnitz, Chemnitz, Germany; 6. Institute for Theoretical Physics, Justus Liebig University, Giessen, Germany; 7. Institute for Physics, Technische Universität Dresden, Dresden, Germany*

GOC-13. **Hybrid Spin-Orbit Torque and Spin-transfer Torque Switching in Coupled Free Layer Systems.** *V. Kateel*[1,2], M.G. Monteiro[1,2], F. Yasin[1], J. De Boeck[1,2], B. Soree[1], S. Rao[1] and S. Couet[1] *1. IMEC, Leuven, Belgium; 2. Department of Electrical Engineering (ESAT), KU Leuven, Leuven, Belgium*

GOC-14. **Damping in STT-MRAM Free Layers at Elevated Temperatures.** *A. Whitney*[1], C. Liu[1], T. Santos[2], R. Chopdekar[2], M. Carey[2], G. Street[1], V. Kalappattil[1] and M. Wu[1] *1. Department of Physics, Colorado State University, Fort Collins, CO, United States; 2. Western Digital Research Center, Western Digital Corporation, San Jose, CA, United States*

GOC-15. **Harmonic Hall Analysis of Current-Induced Torques in Fe_2O_3/Pt Heterostructure.** *H. Zhang*[1] and R. Cheng[1] *1. University of California, Riverside, Riverside, CA, United States*

Session GOD
MAGNETIZATION DYNAMICS IV

Dmytro Bozhko, Chair
University of Colorado Colorado Springs, Colorado Springs, CO, United States

GOD-01. **Quantifying Spin-Mixed States in Ferromagnets.** ***(Invited)*** *J.M. Shaw*[1] *1. NIST, Boulder, CO, United States*

GOD-02. **Precessional dynamics of geometrically scaled magnetostatic spin waves in two-dimensional magnonic fractals.** J. Zhou[1,2], M.K. Zelent[3], Z. Luo[1,2], V. Scagnoli[1,2], M. Krawczyk[3], L. Heyderman[1,2] and *S. Saha*[2,4] *1. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institute, Villigen, Switzerland; 2. Laboratory for Mesoscopic Systems, Department of Materials, ETH Zurich, Zurich, Switzerland; 3. Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 4. Department of Physics, Ashoka University, Sonipat, India*

GOD-03. **Reversal of nanostructured ferromagnets by magnon pulses in underlying yttrium iron garnet.** *A. Mucchietto*[1], K. Baumgaertl[1] and D. Grundler[1,2] *1. Institute of Materials, EPFL, Lausanne, Switzerland; 2. Institute of Electrical and Micro Engineering, EPFL, Lausanne, Switzerland*

GOD-04. **Anomalous angular dependence of ferromagnetic resonance linewidths in perpendicular Bi:YIG films with ultralow damping.** *W. Peria*[1,2], B. Khurana[3], T. Fakhrul[3], C.A. Ross[3] and P.A. Crowell[1] *1. Physics, University of Minnesota, Minneapolis, MN, United States; 2. National High Magnetic Field Laboratory, Los Alamos National Laboratory, Los Alamos, NM, United States; 3. Materials Science, Massachusetts Institute of Technology, Cambridge, MA, United States*

GOD-05. **Generation of Magnons with Nanoscale Wavelengths using Voltage Controlled Parametric Resonance.** *A. Deka*[1,2], B. Rana[3,4], K. Miura[5], H. Takahashi[5], Y. Otani[3,6] and Y. Fukuma[2,3] *1. Electrical and Computer Engineering, Purdue University, Lafayette, IN, United States; 2. Kyushu Institute of Technology, Iizuka, Japan; 3. RIKEN, Tokyo, Japan; 4. ISQI, Faculty of Physics, Adam Mickiewicz University, Poznan, Poland; 5. Hitachi R&D, Kokubunji, Japan; 6. ISSP, University of Tokyo, Tokyo, Japan*

GOD-06. **Dynamics of 3D topological spin textures.** *D.W. Raftrey*[1,2] and P. Fischer[1,2] *1. Physics, University of California Santa Cruz, Santa Cruz, CA, United States; 2. Material Science, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

GOD-07. **Parametrically excited modes in YIG microdisks: identification and nonlinear interactions.** *T. Srivastava*[1], I. Ngouagnia Yemeli[1], G. de Loubens[1], H. Merbouche[2], S. Demokritov[2], V. Demidov[2], M. d'Aquino[3], C. Serpico[3], J. Kim[4], G. Csaba[5], O. Klein[6], N. Beaulieu[7], J. Ben Youssef[7], M. Muñoz[8], I. Boventer[9], V. Cros[9], P. Bortolotti[9] and A. Anane[9] *1. SPEC, CEA, CNRS, Université Paris-Saclay, Gif sur Yvette, France; 2. Institute for Applied Physics, University of Muenster, Muenster, Germany; 3. Department of Electrical Engineering and ICT, University of Naples Federico II, Naples, Italy; 4. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay, Palaiseau, France; 5. Pázmány Péter Catholic University, Faculty of Information Technology and Bionics, Budapest, Hungary; 6. Spintec, CEA, CNRS, Université Grenoble-Alpes, Grenoble, France; 7. LabSTICC, CNRS, Université de Bretagne Occidentale, Brest, France; 8. Instituto de Tecnologías Físicas y de la Información (CSIC), Madrid, Spain; 9. Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, Palaiseau, France*

GOD-08. **Spin Wave Induced Domain Wall Motion in BiYIG.** *M. Gross*[1], Y. Fan[1], T. Fakhrul[1], L. Liu[1] and C.A. Ross[1] *1. Massachusetts Institute of Technology, Cambridge, MA, United States*

GOD-09. **Amplification of the Gyrotropic Mode Power via Interaction with a Hot Magnon Gas.** *P. Artemchuk*[1], V. Tyberkevych[1] and A.N. Slavin[1] *1. Physics, Oakland University, Rochester, MI, United States*

GOD-10. **Scattering Reversals and Higher-Order Interactions in Three-Magnon Scattering of Ferromagnetic Resonance.** *A. Hamill*[1], T. Qu[2], R.H. Victora[2] and P.A. Crowell[1] *1. School of Physics and Astronomy, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

GOD-11. **Withdrawn**

GOD-12. **Non-Trivial Gilbert Damping in One Dimensional Surface Modulated Magnonic Crystals of $Ni_{80}Fe_{20}$.** *S. Khanal*[1,2], P. Sherpa[1], N. Vargas[3] and L. Spinu[1] *1. AMRI, University of New Orleans, New Orleans, LA, United States; 2. Condensed Matter Physics, Charles University, Prague, Czechia; 3. Physics, University of California, San Diego, San Diego, CA, United States*

Session GOE
MAGNETIZATION DYNAMICS V

Jose Angel Fernandez-Roldan, Co-Chair
Helmholtz Zentrum Dresden-Rossendorf, Dresden, Germany
Raghav Sharma, Co-Chair
National University of Singapore, Singapore, Singapore

GOE-01. **Electrical Evidence and Modeling of the Giant Non-Reciprocity of Spin-Waves In Synthetic Antiferromagnets.** *F. Millo*[1], A. Mouhoub[1], J. Kim[1], J. Adam[1], C. Chappert[1], S. Ngom[1], A. Solignac[2] and T. Devolder[1] *1. Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies, Palaiseau, France; 2. SPEC, CEA, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France*

GOE-02. **Interparticle magnetic correlations and dynamics of fluctuations in assemblies of Fe_3O_4 nanoparticles.** *K. Chesnel*[1], J. Rackham[1], D. Griner[1], C. Hawk[1], R. Harrison[1] and A.H. Reid[2] *1. Physics, Brigham Young University, Provo, UT, United States; 2. SIMES, SLAC, Stanford, CA, United States*

GOE-03. **Ferromagnetic Resonance in FePt Thin Films at Elevated Temperatures.** *C. Liu*[1], K. Srinivasan[2], A. Ajan[2], E. McCollum[1], A. Kalitsov[2], V. Kalappattil[1] and M. Wu[1] *1. Colorado State University, Fort Collins, CO, United States; 2. Western Digital, San Jose, CA, United States*

GOE-04. **Compensation of anisotropy in spin-Hall systems for realizing neuromorphic applications.** *P. Sethi*[1], D. Sanz Hernandez[1], F. Ajejas[1], S. Krishnia[1], Y. Sassi[1], V. Cros[1], D. Markovic[1] and J. Grollier[1] *1. Unité Mixte de Physique CNRS/Thales, Université Paris-Saclay, 91767 Palaiseau, France, Palaiseau, France*

GOE-05. **Withdrawn**

GOE-06. **Spin-Orbit Torque Induced Ultrafast Magnetization Switching in a Ferromagnet.** *D. Polley*[1,2], A. Pattabi[2], A. Rastogi[2], K. Jhuria[1], E. Diaz[3], A. Lemaitre[4], M. Hehn[3], J. Gorchon[3] and J. Bokor[1,2] *1. Material Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, Berkeley, CA, United States; 3. Université de Lorraine, Nancy, France; 4. Université Paris Sud, Palaiseau, France*

GOE-07. **Investigation of Sub-Nanosecond Fluctuations on Amorphous FeGe Near a Magnetic Phase Transition.** *R. Tumbleson*[1,2], N. Burdet[3], E. Holingworth[4], A. Singh[2], A. Us Saleheen[2], M. McCarter[2], D.W. Raftrey[1,2], V. Esposito[3], A. Tadesse[3], S.A. Morley[2], D.A. O'Mahoney[4], F. Decker[3], A.H. Reid[3], G. Dakovski[3], S. Kevan[2], P. Fischer[2], F. Hellman[4], J. Turner[3] and S. Roy[2] *1. UC Santa Cruz, Santa Cruz, CA, United States; 2. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 3. SLAC, Menlo Park, CA, United States; 4. UC Berkeley, Berkeley, CA, United States*

GOE-08. **Field-free spin-orbit torque switching of synthetic antiferromagnet through interlayer Dzyaloshinskii-Moriya interaction.** *Z. Wang*[1,2], A. Fert[1,3], B. Koopmans[2] and W. Zhao[1] *1. Beihang University, Beijing, China; 2. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 3. University of Paris-Saclay, Palaiseau, France*

GOE-09. **Spin Dynamics, Loop Formation, and Cooperative Reversal in Artificial Quasicrystals with Tailored Exchange Coupling.** *V.S. Bhat*[1], S. Watanabe[2], F. Kronast[3], K. Baumgaertl[2] and D. Grundler[2,4] *1. International Research Centre MagTop, Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; 2. Laboratory of Nanoscale Magnetic Materials and Magnonics, Institute of Materials (IMX), Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland; 3. Helmholtz-Zentrum Berlin fur Materialien und Energie, Berlin, Germany; 4. Institute of Electrical and Micro Engineering (IEM), Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland*

GOE-10. **Micromagnetics simulations of transient nonlinear spin wave processes under parametric excitation.** *M. Massouras*[1] and J. Kim[1] *1. Centre for Nanoscience and Nanotechnology (C2N), CNRS, Université Paris-Saclay, Palaiseau, France*

GOE-11. **Single-Layer Vertically Graded Fe-Ni Films with Low Damping.** *R.E. Maizel*[1], S. Wu[1], P.P. Balakrishnan[2], A.J. Grutter[2], C. Kinane[3], A. Caruana[3], P. Nakarmi[4], B. Nepal[4], D.A. Smith[1], J.L. Jones[1], W.C. Thomas[1], T. Mewes[4] and S. Emori[1] *1. Physics, Virginia Polytechnic Institute, Blacksburg, VA, United States; 2. Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. ISIS-Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Didcot, United Kingdom; 4. Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States*

GOE-12. **Ultra-fast spin waves with few mm-long decay length in canted antiferromagnet Hematite (α-Fe_2O_3).** *M. Hamdi*[1], F. Posva[1] and D. Grundler[1,2] *1. Institute of Materials, Laboratory of Nanoscale Magnetic Materials and Magnonics, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland; 2. Institute of Electrical and Micro Engineering, Laboratory of Nanoscale Magnetic Materials and Magnonics, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland*

GOE-13. **Study on magnetization dynamics modulated by spin-orbit-torque using rectifying planar Hall effect.** *A. Yamaguchi*[1], Y. Utsumi[1], N. Matsumoto[2], W. Yoshikawa[2] and Y. Fujii[2] *1. University of Hyogo, Kamigori, Japan; 2. KRI, Kyoto, Japan*

GOE-14. **Freezing and thawing magnetic droplet solitons.** ***(Invited)*** *M. Ahlberg*[1], S. Chung[2], S. Jiang[3], A. Frisk[1], M. Khademi[4], R. Khymyn[1], A.A. Awad[1], Q. Le[1], H. Mazraati[5], M. Mohseni[4], M. Weigand[6], I. Bykova[6], F. Groß[6], E. Goering[6], G. Schütz[6], J. Gräfe[6] and J. Åkerman[1] *1. University of Gothenburg, Gothenburg, Sweden; 2. Korea National University of Education, Cheongju, The Republic of Korea; 3. Northwestern Polytechnical University, Xi'an, China; 4. Shahid Beheshti University, Tehran, The Islamic Republic of Iran; 5. KTH Royal Institute of Technology, Stockholm, Sweden; 6. Max Planck Institute for Intelligent Systems, Stuttgart, Germany*

Session GPA
MAGNETIZATION DYNAMICS VI (Poster Session)

Joseph Sklenar, Co-Chair
Wayne State University, Detroit, MI, United States
Shuyuan Shi, Co-Chair
Beihang University, Beijing, China

GPA-01. **Variation of Gilbert damping constant via interface induced magnetic anisotropy in LSMO/PMN-PT heterostructures.** A. Das[1], *M. Mrinalini*[1], T. Usami[2], S. Pati[2], T. Taniyama[2] and V. Gorige[1] *1. School of Physics, University of Hyderabad, Hyderabad 500046, India; 2. Department of Physics, Nagoya University, Furo-cho, Chikusa-ku, Japan*

GPA-02. **Spin Waves in Unsaturated Single-Layered Ferromagnetic Nanorings with Interfacial Dyzaloshinski-Moriya Interactions.** *B. Hussain*[1] and M.G. Cottam[1] *1. Physics and Astronomy, University of Western Ontario, London, ON, Canada*

GPA-03. **Probing magnon-phonon non-equilibrium in thulium iron garnets by optical reflectometry.** G. Lee[1], T. Lee[1], P.C. Van[2], D. Kim[1], M. Seo[1], Y. Jo[3], J. Jeong[2] and *K. Kim*[1] *1. Physics, Korea Adavanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Material Science and Engineering, Chungnam National University, Daejeon, The Republic of Korea; 3. Division of Scientific Instrumentation, Korea Basic Science Institute, Daejeon, The Republic of Korea*

GPA-04. **Characterization of long-distance spin transport in antiferromagnetic NiO.** *I. Sugiura*[1], Y. Kobayashi[1], Y. Shiota[1,2], T. Ono[1,2] and T. Moriyama[1,3] *1. Institute for Chemical Research, Kyoto University, Uji, Japan; 2. Center for Spintronics Research Network, Kyoto University, Uji, Japan; 3. PRESTO, Japan Science and Technology Agency, Kawaguchi, Japan*

GPA-05. **Magnetic Field Detection Using Spin Torque Nano-Oscillator Combined with Magnetic Flux Concentrators.** *D. Tonini*[1], K. Wu[1,2], R. Saha[1] and J. Wang[1] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States*

GPA-06. **Ultra-thin high-quality magnetic insulator films.** B. Elkhoury[1], *M. Haidar*[1] and S. Isber[1] *1. Physics, American University of Beirut, Beirut, Lebanon*

GPA-07. **Magnon-drag observed via field-dependent measurements of thermopower in low-damping ferromagnetic alloy $Co_{25}Fe_{75}$.** *M.R. Natale*[1], D. Wesenberg[1], E. Edwards[2], H. Nembach[2,3], J.M. Shaw[2] and B. Zink[1] *1. Physics and Astronomy, University of Denver, Denver, CO, United States; 2. Quantum Electromagnetics Division, National Institute of Standards and Technology, Boulder, CO, United States; 3. JILA, University of Colorado Boulder, Boulder, CO, United States*

GPA-08. **Electrical detection of antiferromagnetic resonance modes by using 154 GHz gyrotron irradiation.** *S. Funada*[1], T. Moriyama[1,2], K. Hayashi[3], T. Sano[3], K. Sugi[1], Y. Ishikawa[3], Y. Fujii[3], S. Mitsudo[3], M. Kimata[4], Y. Shiota[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; 3. Research Center for Development of Far-Infrared Region, University of Fukui, Fukui, Japan; 4. Institute for Materials Research, Tohoku University, Sendai, Japan*

GPA-09. **Transient retrograde motion of spin wave-driven skyrmions in multilayer wave guides.** *L. Huang*[1], G. Burnell[1] and C. Marrows[1] *1. University of Leeds, Leeds, United Kingdom*

GPA-10. **Asymmetric Control of Spin Wave Propagation Behavior Using Vortex Chirality.** *X. Zhang*[1], X. Yang[2], X. Ma[1,2], J. Shim[2,3], C. Song[4], H. Yu[5] and H. Piao[1,2] *1. China Three Gorges University, Yichang, China; 2. Yanbian University, Yanji, China; 3. POSTECH, Pohang, The Republic of Korea; 4. Tsinghua University, Beijing, China; 5. Beihang University, Beijing, China*

GPA-11. **Magnetocrystalline anisotropy energy and Gilbert damping of two-dimensional half-metallic RhX_2 (X = I, Br, Cl) ferromagnets: Density functional theory study.** *S. Bhardwaj*[1], B.K. Kuanr[1] and R. Ghosh[2] *1. Special Centre for Nanonscience, Jawaharlal Nehru University, New Delhi, India, New Delhi, India; 2. Electronics and Communications Engineering, IIIT Delhi, India, New Delhi, India*

GPA-12. **Dipole-Exchange Spin Waves in 2D van der Waals Ferromagnetic Films and Stripes.** *B. Hussain*[1] and M.G. Cottam[1] *1. University of Western Ontario, London, ON, Canada*

GPA-13. **Photo-induced FMM-like Phase in Underdoped Manganite Thin Films.** *K. Stroh*[1], T. Titze[1], C. Seick[1], M. Schumacher[1], S. Mathias[1], D. Steil[1] and V. Moshnyaga[1] *1. Physikalisches Institut, Georg-August-Universitaet Goettingen, Goettingen, Germany*

GPA-14. **Withdrawn**

GPA-15. **Field-free switching model of Spin-Orbit Torque (SOT-MTJ) device with thermal effect based on voltage-controlled magnetic anisotropy (VCMA).** *S. Li*[1] and Y. Jiang[1] *1. Department of Electrical Engineering, Jiangnan University, Wu Xi, China*

GPA-16. **Effects of Permalloy-Cobalt Cosputtering in a Nanowire Structure on Magnetic Fluctuation and Auto-Oscillation.** B. Kim[1], *S. Yoon*[2], S. Han[3] and B. Cho[1] *1. School of Materials Science and Engineering, Gwangju Institute of Science and Technology, Gwangju, The Republic of Korea; 2. Nano Photonics Group, Korea Institute of Industrial Technology, Gwangju, The Republic of Korea; 3. Division of Navigation Science, Mokpo National Maritime University, Mokpo, The Republic of Korea*

GPA-17. **High Wave Vector Non-reciprocal spin Wave Beams.** *L. Temdie*[1,2], V. Vlaminck[1,2], G. Pradan[3], J. Solano[3], H. Majjad[3], Y. Henry[3] and M. Bailleul[3] *1. MicroWave Dept., IMT Atlantique, Brest, France; 2. UMR 6285 CNRS, Lab-STICC, Brest, France; 3. IPCMS - UMR 7504 CNRS, Strasbourg, France*

GPA-18. **Theory of confined magnons in 3D heterostructures.** *J.A. do Nascimento*[1] and V. Lazarov[1] *1. Physics, University of York, York, United Kingdom*

ORAL SESSIONS

Session HOA

MAGNETIC IMAGING AND MAGNETIZATION DYNAMICS

Andrew Kunz, Chair

Marquette University, Milwaukee, WI, United States

HOA-01. **Direct Imaging of Decision-Making in Nanomagnetic Galton Boards.** *H. Arava*[1], D. Sanz Hernandez[2], F. Montaigne[3], J. Grollier[2] and A. Petford-Long[1] *1. Materials Science Division, Argonne National Laboratory, Chicago, IL, United States; 2. Unité Mixte de Physique CNRS-Thales, Palaiseau, France; 3. Université de Lorraine, Nancy, France*

HOA-02. **Coherent Correlation Imaging: Resolving fluctuating states of matter.** *C. Klose*[1], F. Büttner[2,3], W. Hu[4], C. Mazzoli[4], K. Litzius[3], R. Battistelli[2], I. Lemesh[3], J.M. Bartell[3], M. Huang[3], C.M. Günther[5], M. Schneider[1], A. Barbour[4], S.B. Wilkins[4], G. Beach[3], S. Eisebitt[6,7] and B. Pfau[1] *1. B2: Imaging and Coherent X-rays, Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany; 2. Helmholtz-Zentrum für Materialien und Energie GmbH, Berlin, Germany; 3. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 4. National Synchrotron Light Source II, Brookhaven National Laboratory, Upton, NY, United States; 5. Technische Universität Berlin, Zentraleinrichtung Elektronenmikroskopie (ZELMI), Berlin, Germany; 6. Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, Germany; 7. Technische Universität Berlin, Institut für Optik und Atomare Physik, Berlin, Germany*

HOA-03. **Surface Acoustic Waves Effect on Domain Wall Motion.** *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*

HOA-04. **Effect of nonuniform perpendicular anisotropy in ferromagnetic resonance spectra in magnetic nanorings and nanodisks.** E. Saavedra[1], A. Riveros[2] and *J.L. Palma*[2,3] *1. Physics Department, Universidad de Santiago de Chile, Santiago, Chile; 2. Engineering School, Universidad Central de Chile, Santiago, Chile; 3. CEDENNA, Center for the Development of Nanoscience and Nanotechnology, Santiago, Chile*

HOA-05. **Exploring multiple strain geometries in PMN-PT/Ta/CoFeB/MgO magneto-electric devices.** *S. Roy*[1], A. Solignac[2], T. Bhatnagar-Schöffmann[1], E. Monteblanco[3], R. Pachat[1], A. Harouri[1], R. Juge[3], T. Maroutian[1], D. Ravelosona[1,3], G. Agnus[1] and L. Herrera Diez[1] *1. Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Saclay, Palaiseau, France; 2. SPEC, CEA Saclay, CNRS, Université Paris-Saclay, Gif sur Yvette, France; 3. C2N, Spin-Ion Technologies, Palaiseau, France*

HOA-06. **Stress-Engineered Microwave Generation induced by Phonon-Magnon-Photon Coupling in Patterned Arrays of Nanowires.** *A. Samanta*[1,2] 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*

HOA-07. **Computational Validation of Method for Decomposition of Mechanical Stress Effect on Magnetic Property of Silicon Steel Sheet.** H. Shimizu[1], Y. Marumo[1], Y. Mishima[1] and *T. Matsuo*[1] *1. Kyoto University, Kyoto, Japan*

HOA-08. **Revealing nanoscale disorder in W/CoFeB/MgO ultra-thin films with domain wall motion.** *J.W. van der Jagt*[1,2], V. Jeudy[3], A. Thiaville[3], M. Sall[1], N. Vernier[4,5], L. Herrera Diez[4], M. Belmeguenai[6], Y. Roussigné[6], S.M. Chérif[6], M. Fattouhi[7], L. Lopez-Diaz[7], A. Lamperti[8], R. Juge[1] and D. Ravelosona[1,4] *1. Spin-Ion Technologies, Palaiseau, France; 2. Université Paris-Saclay, Gif-sur-Yvette, France; 3. Laboratoire de Pysique des Solides, Orsay, France; 4. Centre de Nanosciences et de Nanotechnologies, Palaiseau, France; 5. Laboratoire des Sciences des Procédés et des Matériaux, Villetaneuse, France; 6. Applied Physics, Universidad de Salamanca, Salamanca, Spain; 7. Unit of Agrate Brianza, CNR-IMM, Agrate Brianza, Italy; 8. Universite Paris-Saclay, CNRS, ENS Paris-Saclay, CentraleSupelec, LuMIn, Gif-sur-Yvette, France*

HOA-09. **Role of the thermal magnetization fluctuation in depinning of domain wall from constraints on the ferromagnetic nanowire.** *S. Ahn*[1,2] *1. Center for Semiconductor Technology Convergence, Pohang University of Science and Technology (POSTECH), Pohang 37673, Gyeongbuk, The Republic of Korea; 2. Department of Electrical Engineering, Pohang University of Science and Technology (POSTECH), Pohang 37673, Gyeongbuk, The Republic of Korea*

HOA-10. **Oersted-Field Driven Domain-Wall Motion in Core-Shell Nanotubes.** M. Scheuerlein[1], M. Jaber[2], A. Masseboeuf[2], W. Ensinger[1], S. Finizio[3] and *O. Fruchart*[2] *1. Technical University Darmstadt, Darmstadt, Germany; 2. SPINTEC, Grenoble, France; 3. Paul Scherrer Institut, Villigen, Switzerland*

HOA-11. **Analysis of magneto-transport properties in $Mn_{4-x}Au_xN$ epitaxial films and their magnetic structures by x-ray magnetic circular dichroism.** *T. Horiuchi*[2], T. Komori[2], T. Hirose[2], T. Yasuda[2], K. Amemiya[1], K. Toko[2] and T. Suemasu[2] *1. KEK-IMSS, Tsukuba, Japan; 2. Univ. of Tsukuba, Tsukuba, Japan*

HOA-12. **All-Optical Switchable Racetrack based on Compensated Co/Gd quad-layers.** *P. Li*[1], T. Kools[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

HOA-13. **Tuning domain wall edge pinning in microwires with He^+ irradiation.** *J.W. van der Jagt*[1,2], M. Massouras[3], D. Mailly[3], E. Monteblanco[1], L. Herrera Diez[3], R. Juge[1] and D. Ravelosona[1,3] *1. Spin-Ion Technologies, Palaiseau, France; 2. Université Paris-Saclay, Gif-sur-Yvette, France; 3. Centre de Nanosciences et de Nanotechnologies, Palaiseau, France*

HOA-14. **Emergence of sizeable interfacial Dzyaloshinskii-Moriya interaction at Cobalt/Fullerene spinterface.** *E. Pandey*[1], B. Ojha[1] and S. Bedanta[1] *1. Physical Sciences, National Institute of Science Education and Research, Bhubaneswar, Khordha, India*

HOA-15. **Influence of Laser Cutting on Magnetic Domain Structure of Non-oriented Steel.** C. Zhang[1] and *Y. Zhang*[1] *1. School of Electrical Engineering, Hebei University of Technology, Tianjin, China*

Session HOB
MAGNETIZATION DYNAMICS AND MICROMAGNETICS
Gabriel Chaves-O'Flynn, Chair
Polska Akademia Nauk Instytut Fizyki Molekularnej, Poznan, Poland

HOB-01. **Field-free CoFeB/Ta/CoFeB SOT Devices Achieved by Modulating Spacer Thickness:Simulation and Experiment.** *Y. Lin*[1], C. Cheng[1], W. Chan[2], Y. Huang[1], Y. Lin[2], Y. Huang[1], M. Chen[3], S. Chang[3], G. Chen[2] and Y. Tseng[1] *1. National Yang Ming Chiao Tung University, Hsinchu, Taiwan; 2. National Chung Cheng University, Hsinchu, Taiwan; 3. Powerchip Semiconductor Manufacturing Corporation, Hsinchu, Taiwan*

HOB-02. **Energetics of the Spin-Flop and Spin-Flip Transitions in Antiferromagnets.** M. Hu[1], M.A. Hoefer[1] and *M.J. Donahue*[2] *1. University of Colorado Boulder, Boulder, CO, United States; 2. NIST, Gaithersburg, MD, United States*

HOB-03. **Micromagnetic Modelling of Multi Coupled Free Layers for Magnetic Tunnel Junction Devices.** *M.G. Monteiro*[1,2], V. Kateel[1,2], K. Fan[1,2], J. De Boeck[1,2], K. Cai[1], S. Rao[1], S. Couet[1] and G.S. Kar[1] *1. IMEC, Leuven, Belgium; 2. Department of Electric Engineering (ESAT), KU Leuven, Leuven, Belgium*

HOB-04. **Bloch points in helimagnetic nanostrips.** *M. Lang*[1,2], M. Beg[1,3], O. Hovorka[1] and H. Fangohr[1,2] *1. Faculty of Engineering and Physical Sciences, University of Southampton, Southampton, United Kingdom; 2. Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 3. Department of Earth Science and Engineering, Imperial College London, London, United Kingdom*

HOB-05. **Withdrawn**

HOB-06. **Geometry-driven dynamics of magnetic topological solitons.** *K. Yershov*[1,2] *1. IFW Dresden, Dresden, Germany; 2. Bogolyubov Institute for Theoretical Physics, Kyiv, Ukraine*

HOB-07. **Micromagnetics and Current-Induced Domain-Wall Dynamics in Chemically-Modulated Nanowires.** L. Alvaro-Gomez[1,2], S. Ruiz-Gómez[3], C. Fernández González[2,4], M. Schöbitz[1,5], N. Mille[6], D. Tiwari[1], M. Foerster[7], L. Aballe[7], R. Belkhou[6], J. Toussaint[8], C. Thirion[8], A. Masseboeuf[1], D. Gusakova[1], L. Pérez[2,4] and *O. Fruchart*[1] *1. SPINTEC, Grenoble, France; 2. IMDEA Nanociencia, Madrid, Spain; 3. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 4. Dpto. de Fisica de Materiales, Universidad Complutense de Madrid, Madrid, Spain; 5. Univ. Erlangen-Nürnberg, Erlangen, Germany; 6. Synchrotron SOLEIL, Gif-sur-Yvette, France; 7. ALBA Synchrotron Light Facility, Barcelona, Spain; 8. Institut Néel, Grenoble, France*

HOB-08. **Reconfigurable domain wall pinning in synthetic antiferromagnets.** T. Lee[1], S. Jeong[2], S. Kim[2] and *K. Kim*[1] *1. Physics, Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea; 2. Physics, Ulsan University, Ulsan, The Republic of Korea*

HOB-09. **Coupled Néel-Brown magnetization dynamics of magnetic nanoparticles for thermal and magnetic particle imaging.** *T.Q. Bui*[1], A.J. Biacchi[1], K.N. Quelhas[1], F.M. Abel[1], M. Henn[1], E. De Lima Correa[1], W.L. Tew[1], A.R. Hight Walker[1], C. Dennis[1], M.J. Donahue[1], P.N. Haney[1] and S.I. Woods[1] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States*

HOB-10. **Magnetic Coupling in asymmetric $Co_{65}Fe_{35}$/Ru Heterostructures.** *U. Karki*[1], B. Nepal[1], G.J. Mankey[1] and T. Mewes[1] *1. Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States*

HOB-11. **Domain Walls Dynamics in Randomized Dzyaloshinskii-Moriya Interaction Mediated Amorphous Fe-Ge Thin Films.** *A. Singh*[1], E. Holingworth[2], S.A. Morley[3], X. Chen[1,4], A.U. Saleheen[3], R. Tumbleson[1,5], M. McCarter[3], P. Fischer[1,5], F. Hellman[2], S. Kevan[3] and S. Roy[3,1] *1. Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 2. Department of Physics, University of California, Berkeley, CA, United States; 3. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 4. NSLS2, Brookhaven National Laboratory, Upton, NY, United States; 5. Department of Physics, University of California, Santa Cruz, CA, United States*

HOB-12. **Magnetic Switching and Stoner-Wohlfarth Model of 2D Single Domain Magnets.** *E. Ibrahim*[1] and S. Zhang[1] *1. Physics, University of Arizona, Tucson, AZ, United States*

HOB-13. **Current-induced magnetic octupole domain-wall dynamics.** *M. Wu*[1,2], T. Chen[3], T. Nomoto[4], H. Isshiki[1], Y. Nakatani[5], T. Higo[6], T. Tomita[6], K. Kondou[2], R. Arita[4], S. Nakatsuji[6] and Y. Otani[1,2] *1. ISSP, The University of Tokyo, Kashiwa, Japan; 2. Research Center for Advanced Science and Technology, The University of Tokyo, Hongo, Japan; 3. School of Physics, Southeast University, Nanjing, China; 4. Department of Computer Science, University of Electro-Communications, Meguro-ku, Japan; 5. Department of Physics, The University of Tokyo, Hongo, Japan; 6. CEMS, RIKEN, Wako, Japan*

Session HOC
NEW APPROACHES IN COMPUTATIONAL MAGNETISM

Michael Donahue, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

HOC-01. **Generative deep learning for permanent magnet microstructures. *(Invited)*** A. Kovacs[1,2], A. Kornell[1,2], Q. Ali[1,2], J. Fischbacher[1,2], M. Gusenbauer[1,2], H. Oezelt[1,2], M. Yano[3], N. Sakuma[3], A. Kinoshita[3], T. Shoji[3], A. Kato[3] and *T. Schrefl*[1,2] *1. Christian Doppler Laboratory for Magnet design through physics informed machine learning, Wiener Neustadt, Austria; 2. Department for Integrated Sensor Systems, University for Continuing Education Krems, Wiener Neustadt, Austria; 3. Advanced Materials Engineering Div., Toyota Motor Corporation, Mishuku Susono, Japan*

HOC-02. **Transformer Neural Networks for Predicting Magnetization Dynamics.** *S. Pollok*[1], S.T. Kotewitz[1], N.M. Lassen[1] and R. Bjørk[1] *1. Department of Energy Conversion and Storage, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark*

HOC-03. **Artificial Neural Networks for the Analysis of Ferromagnetic Resonance Spectra.** D.W. Slay[1] and *M. Charilaou*[1] *1. Physics, University of Louisiana at Lafayette, Lafayette, LA, United States*

HOC-04. **Finite Element Solver for Harmonic Linearized Landau-Lifshitz-Gilbert Equation.** *Z. Lin*[1] and V. Lomakin[1] *1. University of California, San Diego, San Diego, CA, United States*

HOC-05. **Reduced Order Model for Large Multigrain Systems.** *H. Oezelt*[1,2], M. Gusenbauer[1,2], A. Kornell[1,2], J. Fischbacher[1,2], Q. Ali[1,2], L. Breth[2], M. Yano[3], N. Sakuma[3], A. Kinoshita[3], T. Shoji[3], A. Kato[3] and T. Schrefl[1,2] *1. Christian Doppler Laboratory for Magnet design through physics informed machine learning, Wr. Neustadt, Austria; 2. Department for Integrated Sensor Systems, Danube University Krems, Wr. Neustadt, Austria; 3. Advanced Materials Engineering Div., Toyota Motor Corporation, Mishuku Susono, Japan*

HOC-06. **Simulation of Soft Magnetic Composites with Periodic Strayfield Calculation.** *A. Ducevic*[1], F. Bruckner[1], C. Abert[1] and D. Suess[1] *1. Functional Materials, University of Vienna, Vienna, Austria*

HOC-07. **Accurate finite-difference micromagnetics of magnets including RKKY interaction - analytical solution and comparison to standard micromagnetic codes.** *D. Suess*[1], S. Koraltan[1], F. Bruckner[1] and C. Abert[1] *1. University of Vienna, Vienna, Austria*

HOC-08. **An improved Preisach distribution function identification method considering reversible magnetization effect.** L. Chen[1], *L. Cui*[1], T. Ben[1], L. Jing[2] and Q. Liu[2] *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*

HOC-09. **mag2exp: Simulating experimental techniques from computational micromagnetics.** *S. Holt*[1], M. Lang[1,2], J. Loudon[3], T. Hicken[4,5], S. Pathak[1,2], D. Cortés-Ortuño[1,6], M. Beg[1,7] and H. Fangohr[1,2] *1. University of Southampton, Southampton, United Kingdom; 2. Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 3. University of Cambridge, Cambridge, United Kingdom; 4. Royal Holloway, Egham, United Kingdom; 5. Durham University, Durham, United Kingdom; 6. Utrecht University, Utrecht, Netherlands; 7. Imperial College London, London, United Kingdom*

HOC-10. **Modeling Magnetic Domain Wall Motion with Neural Ordinary Differential Equations.** *N. Hassan*[1], F. Garcia-Sanchez[2], D. Querlioz[3] and J.S. Friedman[1] *1. Electrical and Computer Engineering, University of Texas at Dallas, Dallas, TX, United States; 2. Departamento de Física Aplicada, Universidad de Salamanca, Salamanca, Spain; 3. Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, Palaiseau, France*

HOC-11. **Proper modeling of material interfaces in numerical micromagnetics.** *C. Abert*[1], P. Heistracher[1], F. Bruckner[1], T. Schrefl[2] and D. Suess[1] *1. University of Vienna, Vienna, Austria; 2. Danube University Krems, Krems, Austria*

HOC-12. **Modeling magnetic correlations in magnetite nanoparticle assemblies using x-ray magnetic scattering data.** *J. Rackham*[1], K. Chesnel[1] and M. Transtrum[1] *1. Physics, Brigham Young University, Provo, UT, United States*

HOC-13. **Simulation on time-dependent voltage distribution regarding van der Waals tunneling gap.** *K. Kim*[1,2], H. Kwon[2], T. Park[2], S. Kim[1] and K. Kim[2] *1. Physics, University of Ulsan, Ulsan, The Republic of Korea; 2. Center for spintronics, Korea Institute of Science and Technology, Seoul, The Republic of Korea*

HOC-14. **Classification of Coexisting Defects from Magnetic Flux Leakage Data Using Deep Learning Method.** *G. Piao*[1], J. Ling[2] and J. Li[1] *1. Department of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, United States; 2. School of Engineering, The University of British Columbia, Kelowna, BC, Canada*

HOC-15. **Forecasting the Outcome of Spintronic Experiments with Neural Ordinary Differential Equations.** ***(Invited)*** *D. Querlioz*[1] *1. Univ. Paris-Saclay, CNRS, Palaiseau, France*

Session HOD
SKYRMIONS: CHARACTERIZATION, DYNAMICS AND CONTROL

Kab-Jin Kim, Co-Chair
Korea Advanced Institute of Science and Technology, Daejeon, The Republic of Korea
Thomas Winkler, Co-Chair
JGU Mainz, Mainz, Germany

HOD-01. **Nonlinear dynamics of skyrmion and bimeron in the presence of deformation.** *Q. Shao*[1,2], Z. Chen[2], X. Wang[1], L. Shen[3] and Y. Zhou[3] *1. ECE, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong; 2. Physics, The Hong Kong University of Science and Technology, Hong Kong, Hong Kong; 3. The Chinese University of Hong Kong, Shenzhen, Shenzhen, China*

HOD-02. **Elliptical Ferromagnetic Skyrmions.** *K. Takahashi*[1], T. Naruse[1] and K. Kondo[1] *1. RIES, Hokkaido Univ., Sapporo, Japan*

HOD-03. **Magnetic bubbles in low-damping ultra-thin garnets with perpendicular magnetic anisotropy.** *D. Gouéré*[1], Y. Sassi[1], K. Bouzehouane[1], C. Carrétéro[1], P. Bortolotti[1], V. Cros[1], N. Reyren[1] and A. Anane[1] *1. Unité Mixte CNRS / THALES / Univ. Paris-Saclay, Palaiseau, France*

HOD-04. **Annealing a skyrmion lattice with spin wave excitations.** T. Srivastava[1], G. de Loubens[2] and *J. Kim*[2] *1. Centre for Nanoscience and Nanotechnology (C2N), CNRS, Université Paris-Saclay, Palaiseau, France; 2. SPEC, CEA, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France*

HOD-05. **Analysis of the stochastic process of skyrmion with transfer entropy.** *H. Mori*[1], M. Goto[1,2], R. Ishikawa[3], S. Miki[1], H. Nomura[1,2] and Y. Suzuki[1,2] *1. Graduate school of Engineering Science, Osaka University, Toyonaka, Japan; 2. CSRN-Osaka, Osaka University, Toyonaka, Japan; 3. ULVAC, Inc., Suita, Japan*

HOD-06. **Hysteretic resonances of chiral spin textures in multilayer films.** *S. Thyagarajan*[1], J. Huang[1], X. Chen[2], H. Tan[2], A. Ghosh[2], J. Zhou[2], H. Tan[2] and A. Soumyanarayanan[1,2] *1. Physics, National University of Singapore, Singapore, Singapore; 2. Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology and Research (ASTAR), Singapore, Singapore*

HOD-07. **Theoretical Consideration of Logic Gates Based on Skyrmions in Antiferromagnets.** *T. Naruse*[1] and K. Kondo[1] *1. RIES, Hokkaido Univ., Sapporo, Hokkaido, Japan*

HOD-08. **Three-dimensional Skyrmion Confinement Through Thickness Modulation.** *S. Pathak*[1,2], M. Lang[2,3], S. Holt[2], H. Fangohr[2,3] and R. Hertel[1] *1. IPCMS, University of Strasbourg, Strasbourg, France; 2. Faculty of Engineering and Physical Sciences, University of Southampton, Southampton, United Kingdom; 3. Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany*

HOD-09. **Controlled skyrmion creation from a Domain wall pair for logic gate applications.** *H. Perumal*[1], S. Syamlal[1], B. Priyanka[1] and J. Sinha[1] *1. Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Chennai, India*

HOD-10. **Analyzing collective thermal Skyrmion Dynamics by coarse graining.** *T.B. Winkler*[1], J. Rothörl[1], M.A. Brems[1], K. Raab[1], H. Fangohr[2,3] and M. Kläui[1] *1. Institute of Physics, Johannes Gutenberg university, Mainz, Germany; 2. Scientific Support Unit for Computational Science, Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 3. Computational Modelling Group, Faculty of Engineering and Physical Sciences, Hamshire, United Kingdom*

HOD-11. **Withdrawn**

HOD-12. **Current-induced Bifurcation of a Three-dimensional Topological Skyrmion String.** *J. Xia*[1], X. Zhang[1], O. Tretiakov[2], H.T. Diep[3], J. Yang[4], G. Zhao[5], M. Ezawa[6], Y. Zhou[7] and X. Liu[1] *1. Shinshu University, Nagano, Japan; 2. The University of New South Wales, Sydney, NSW, Australia; 3. CY Cergy Paris Université, Cergy, France; 4. Peking University, Beijing, China; 5. Sichuan Normal University, Chengdu, China; 6. The University of Tokyo, Tokyo, Japan; 7. The Chinese University of Hong Kong, Shenzhen, Guangdong, China*

HOD-13. **Magnetization dynamics of skyrmion tubes and Bloch points in exchange-spring heterostructures.** *M. Charilaou*[1] *1. Physics, University of Louisiana at Lafayette, Lafayette, LA, United States*

HOD-14. **The Role of Disclinations in the Thermal Stability of Magnetization Textures in Confined Helimagnetic Nanostructures.** *G.D. Chaves-O'Flynn*[1], D.L. Stein[2] and P. Kuswik[1] *1. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland; 2. Department of Physics and Courant Institute of Mathematical Sciences, New York University, New York, NY, United States*

HOD-15. **Image-recognition-assisted Characterization of Disordered Skyrmion States in Chiral Magnetic Thin-film Simulations.** *C. Rudderham*[2], A. Zelenskiy[2], M. Plumer[1,2] and T. Monchesky[2] *1. Physics and Physical Oceanography, Memorial University of Newfoundland, St. John's, NL, Canada; 2. Physics and Atmospheric Science, Dalhousie University, Halifax, NS, Canada*

Session HPA
MAGNETIZATION DYNAMICS AND MICROMAGNETICS (Poster Session)

Stefan Pollok, Co-Chair
Danmarks Tekniske Universitet, Kgs. Lyngby, Denmark
Alexander Kovacs, Co-Chair
Danube University Krems, Wiener Neustadt, Austria

HPA-01. **Electronic Heat Bath Simulations for Ultra-fast Spin Dynamics.** *J. Ross*[1], R. Chantrell[1] and R. Evans[1] *1. Physics, University of York, York, United Kingdom*

HPA-02. **Simulation of Magnetic Hysteresis in Cobalt-Based Metal Amorphous Nanocomposites.** *K.S. Cole-Piepke*[1], P. Nakarmi[1], A. Koenig[2], T. Mewes[1], G. Thompson[2], R. Noebe[3] and A. Leary[3] *1. Department of Physics and Astronomy, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Metallurgical and Materials Engineering, The University of Alabama, Tuscaloosa, AL, United States; 3. Materials and Structures Division, NASA Glenn Research Center, Cleveland, OH, United States*

HPA-03. **Theoretical Investigation of Tunable Ferrimagnetic Spin-Chain Oscillation Based on Atomistic Spin Model Simulation.** *B. Cai*[1], X. Zhang[2], Z. Zhu[2] and G. Liang[1] *1. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; 2. School of Information Science and Technology, ShanghaiTech University, Shanghai, China*

HPA-04. **Withdrawn**

HPA-05. **Co Layer-Resolved Measurement of Dzyaloshinskii-Moriya Interaction at Pt/Co Single Interface.** *J. Yu*[1], S. Lee[1], M. Kim[1] and S. Choe[1] *1. Physics and Astronomy, Seoul National University, Seoul, The Republic of Korea*

HPA-06. **Torsion and curvature induced effects in magnetic twisted nanotubes.** *M.M. Salazar Carona*[1] and J.A. Otalora Arias[1] *1. Physics, Universidad Católica del Norte, Antofagasta, Chile*

HPA-07. **Withdrawn**

HPA-08. **Withdrawn**

HPA-09. **Investigation on simple numerical modeling of anomalous eddy current loss in steel sheet using multiple boundary conditions.** *Y. Gao*[1], T. Ohira[1], Y. Gotoh[1], W. Guan[2], X. Zhao[3] and K. Muramatsu[4] *1. Oita University, Oita, Japan; 2. Wuhan Unviversity, Wuhan, China; 3. North China Electric Power University, Baoding, China; 4. Saga University, Saga, Japan*

HPA-10. **The Study of the Three-dimensional Vector Hysteresis Model based on the SAE model and Play operator.** *Y. Ma*[1], Y. Li[1], R. Chen[1], S. Yue[1] and H. Sun[1] *1. Hebei University of Technology, Tianjin, China*

HPA-11. **Effects of Mixed Coordination Numbers in Artificial Spin Ice Systems.** *A. Kunz*[1] and L.J. Ruffolo[1] *1. Physics, Marquette University, Milwaukee, WI, United States*

HPA-12. **Generalized Auto-oscillator Model for Arbitrary Artificial spin ices.** *G. Alatteili*[1] and E. Iacocca[1] *1. Physics and Energy Science, University of Colorado Colorado Springs, Colorado Springs, CO, United States*

HPA-13. **Study of temperature influences on the vortex chirality probability in asymmetric disk array.** *K. Lai*[1], C. Chen[1], D. Shiu[1] and L. Horng[1] *1. Physics, National Changhua University of Education, Changhua, Taiwan*

HPA-14. **Reliable control of magnetic vortex chirality in asymmetrically optimized magnetic nanodisk.** *H. Zhang*[1], H. Yu[1], X. Zhang[1], X. Yang[2], J. Shim[2,3], X. Ma[2,1] and H. Piao[2,1] *1. Hubei Engineering Research Center of Weak Magnetic-Field Detection, China Three Gorges University, Yichang, China; 2. College of Science, Yanbian University, Yanji, China; 3. POSTECH, Department of Physics and Center for Attosecond Science and Technology, Pohang, The Republic of Korea*

HPA-15. **Micromagnetic investigation of the influence of magnetoelastic anisotropy on magnetisation processes in rapidly quenched magnetostrictive amorphous nanowires.** *C. Rotarescu*[1], J. Pinto de Queiros Fradet[2], O. Chubykalo-Fesenko[2], H. Chiriac[1], N. Lupu[1] and T. Óvári[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania; 2. Instituto de Ciencia de Materiales, CSIC, Madrid, Spain*

HPA-16. **Withdrawn**

HPA-17. **Design and research of the New Hybrid excited consequent pole Brushless Doubly Fed Machine.** T. Ren[1,2], *X. Wu*[1], X. Zhang[2], C. Kan[1], X. Li[1] and W. Zhuo[2] *1. Hefei University of Technology, Hefei, China; 2. Anhui CRRC Ruida Electric Co., Ltd., Hefei, China*

HPA-18. **Construction of High-performance Nanocomposites Based on Shape Anisotropy of Soft Phase.** *Y. Teng*[1], Y. Li[1], M. Yue[1], W. Liu[1] and D. Zhang[1] *1. Faculty of Materials and Manufacturing, Beijing University of Technology, Beijing, China*

HPA-19. **Magnetization reversal dynamics of a triangular-shaped magnetic fractals.** *R. Mehta*[1] and S. Saha[1] *1. Department of Physics, Ashoka University, Sonipat, India*

HPA-20. **Effect of Dzyaloshinskii-Moriya Interactions on Magnetization Reversal in Perpendicularly Magnetized Nanodots of Different Shape.** *S. Syamlal*[1], B. Priyanka[1], H. Perumal[1] and J. Sinha[1] *1. Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Chennai, India*

HPA-21. **Magnetization in Iron-based compounds: A Machine Learning Model Analysis.** *Y. Khatri*[1], A. Shah[1] and A. Kashyap[1] *1. IIT Mandi, Mandi, India*

POSTER SESSIONS

Session HPB
SKYRMIONS AND DOMAIN WALLS (Poster Session)

Jackson Ross, Co-Chair
University of York, York, United Kingdom
Harald Oezelt, Co-Chair
Danube University Krems, Wiener Neustadt, Austria

HPB-01. **Voltage-controlled domain wall-based nanodevices for artificial neurons in a strain-mediated multiferroic heterostructure.** X. He[1], *G. Yu*[1], Z. Chen[1], X. Cai[1], M. Zhu[1], Y. Qiu[1] and H. Zhou[1] *1. China Jiliang University, Hangzhou, China*

HPB-02. **Precise Trajectory Control of Skyrmion Motion 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*

HPB-03. **Reconfigurable Skyrmion Logic Gates with Circular Track.** *L. Yang*[1,2], W. Li[1,2], Y. Tao[1,2], K. Dong[1,2] and H. Li[3] *1. School of Automation, China University of Geosciences, Hubei, China; 2. Hubei key Laboratory of Advanced Control and Intelligent Automation for Complex Systems, Hubei, China; 3. Beijing Superstring Academy of Memory Technology, Beijing, China*

HPB-04. **Improvement of Domain Wall Velocity and Reduction of Current Density by Laser Annealing to the TbCo Wires.** *Y. Miyose*[1], S. Ranjbar[1], S. Sumi[1], K. Tanabe[1] and H. Awano[1] *1. Toyota Technological Institute, Nagoya, Japan*

HPB-05. **Withdrawn**

HPB-06. **Annealing Process of Co-Fe-B based Multilayers showing Skyrmion Brownian Motion.** *M. Goto*[1,2], R. Ishikawa[3], H. Nomura[1,2] and Y. Suzuki[1,2] *1. Osaka University, Toyonaka, Japan; 2. CSRN-Osaka, Toyonaka, Japan; 3. ULVAC Inc., Suita, Japan*

HPB-07. **Deformation Induced Skyrmion Rotation and Locomotion.** *D. Foiles*[1] and A. Hoffmann[1] *1. Materials Science and Engineering, University of Illinois Urbana-Champaign, Urbana, IL, United States*

HPB-08. **Tuning domain wall chirality of Pt/Co/Pt based Perpendicularly Magnetized systems with Au insertion.** *S. Maji*[1], S. Kayal[1], A. Mukhopadhyay[1] and P. Kumar[1] *1. Physics, Indian Institute of Science Bangalore, Bengaluru, India*

Session IOA

MAGNETIC RECORDING I

Simon Greaves, Chair

Tohoku University, Sendai, Japan

IOA-01. **Pt-Transition Metal Synthetic Ferrimagnets for All Optical Switching.** *J.N. Scott*[1], M. Dabrowski[2], W. Hendren[1], A. Frisk[3], D. Burn[3], D. Newman[2], C. Sait[2], P.S. Keatley[2], A. N'Diaye[4], T. Hesjedal[5], G. van der Laan[3], R. Hicken[2] and R. Bowman[1] *1. Queen's University Belfast, Belfast, United Kingdom; 2. University of Exeter, Exeter, United Kingdom; 3. Diamond Light Source, Didcot, United Kingdom; 4. Advanced Light Source, Berkeley, CA, United States; 5. University of Oxford, Oxford, United Kingdom*

IOA-02. **Energy efficient single pulse switching of magnetic nanodisks using surface lattice resonances.** ***(Invited)*** *M. Verges*[1], S. Perumbilavil[2], J. Hohlfeld[1], F. Freire-Fernandez[3], Y. LeGuen[1,2], N. Kuznetsov[2], G. Malinowski[1], F. Montaigne[1], D. Lacour[1], M. Hehn[1], S. van Dijken[2] and S. Mangin[1] *1. Institut Jean Lamour, UMR CNRS 7198, Université de Lorraine, Nancy, France; 2. Department of Applied Physics, Aalto University School of Science, Aalto, Finland; 3. Department of Materials Science and Engineering and Department of Chemistry, Northwestern University, Evanston, IL, United States*

IOA-03. **All optical writing and current-driven shifting of bits in ferrimagnetic strips: a micromagnetic study.** V. Raposo[1] and *E. Martinez*[1] *1. Fisica Aplicada, Universidad de Salamanca, Salamanca, Spain*

IOA-04. **Field-free all optical switching in Tb/Co multilayer magnetic tunnel junction.** *D. Salomoni*[1], Y. Peng[2], L. Farcis[1], S. Auffret[1], M. Hehn[2], G. Malinowski[2], S. Mangin[2], B. Dieny[1], L.D. Buda-Prejbeanu[1], R. Sousa[1] and L. Prejbeanu[1] *1. SPINTEC, CEA/ CNRS/ UGA, Grenoble, France; 2. Institut Jean Lamour, UMR CNRS 7198, Université de Lorraine, Nancy, France*

IOA-05. **Efficiency Enhanced Magnetic Resonance Switching of Single Domain Particle with Uniaxial Anisotropy.** *J. Zhu*[1] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States*

IOA-06. **Plasmonic Near Field Transducer of Nanocomposite with Distributed Feedback.** *T. Du*[1,2], D.E. Laughlin[1,2], J. Bain[1,3], W. Zhang[1,3] and J. Zhu[1,3] *1. Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Dept. of Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Dept. of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States*

IOA-07. **Giant inverse spin Hall effect in BiSb topological insulator for SOT reader.** *H. Ho*[1], J. Sasaki[1], N. Huynh Duy Khang[1], P. Nam Hai[1], Q. Le[2], B. York[2], C. Hwang[2], X. Liu[2], M. Gribelyuk[2], X. Xu[2], S. Le[2], M. Ho[2] and H. Takano[2] *1. Tokyo Institute of Technology, Tokyo, Japan; 2. Western Digital Inc., San Jose, CA, United States*

IOA-08. **Magnetic Read Head Design using a Lateral Spin Valve.** *R. Hao*[1] and R. Victora[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOA-09. **Optimized mitigation of asymmetric oscillation noise in magnetic readers.** *A. Stankiewicz*[1] and M. Samiepour[2] *1. Recording Head Group, Seagate Technology, Bloomingtom, MN, United States; 2. Recording Head Group, Seagate Technology, Londonderry, United Kingdom*

IOA-10. **High Symbol De-Bruijn Code as an Absolute Pattern for Rotary Magnetic Encoders of Arbitrary Size.** *K. Peng*[1], H. Hsiao[1] and J. Chang[1] *1. Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan*

ORAL SESSIONS

Session IOB
MAGNETIC RECORDING II
Chris Rea, Chair
Seagate Technology, Edina, MN, United States

IOB-01. **Withdrawn**

IOB-02. **Machine learning assisted micromagnetic approximation for FePt HAMR media.** *A. Bolyachkin*[1], E. Dengina[1,2], H. Sepehri-Amin[1,2], Y. Takahashi[1] and K. Hono[1,2] *1. National Institute for Materials Science, Tsukuba, Japan; 2. University of Tsukuba, Tsukuba, Japan*

IOB-03. **RF-Biased sputtering induced formation of hexagonal boron nitride (h-BN) grain boundaries in $L1_0$ FePt-BN granular thin films.** *C. Xu*[1], B. Varapasad[1], D.E. Laughlin[2] and J. Zhu[1] *1. Department of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Department of Materials Science and Engineering, Carnegie Mellon Univeristy, Pittsburgh, PA, United States*

IOB-04. **Reactive Molecular Dynamics Modeling of Plasma Etching of $L1_0$-FePt Magnetic Media.** *J. Zhu*[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOB-05. **FePt-BN Granular HAMR Media with High Grain Aspect Ratio and High $L1_0$ Ordering on Corning Lotus™ NXT Glass.** *V. Bollapragada*[2], C. Xu[2], M. Huang[3], D.E. Laughlin[1] and J. Zhu[2] *1. Department of Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Department of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Corning Research and Development Corporation, Corning, NY, United States*

IOB-06. **A Rate-7/8 Modulation Code for Double-Track Reading Scheme in BPMR Systems.** *C. Buajong*[2], S. Koonkarnkhai[1], P. Kovintavewat[1] and C. Warisarn[2] *1. Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand; 2. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand*

IOB-07. **Double-Layer Magnetic Recording with Multilayer Perceptron Decoder for Single-Reader/Two-Track Reading in BPMR Systems.** *N. Rueangnetr*[1], S. Koonkarnkhai[2], P. Kovintavewat[2] and C. Warisarn[1] *1. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand; 2. Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand*

IOB-08. **A Study of Bit Island Spacing Optimization of Staggered Patterned Media-based SRTR Scheme in BPMR Systems.** *M. Mattayakan*[1], S. Koonkarnkhai[2], P. Kovintavewat[2] and C. Warisarn[1] *1. King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand; 2. Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand*

IOB-09. **Dependence of User Density on System and Media Parameters for Shingled Heat Assisted Magnetic Recording (HAMR).** *K. Hosen*[1] and R.H. Victora[1] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

IOB-10. **Effectiveness of a Pulsed Laser in Heat Assisted Magnetic Recording.** *Y. Chen*[1] and R.H. Victora[1] *1. University of Minnesota, Minneapolis, MN, United States*

IOB-11. **Skew Angle Estimation and Alleviation Based Multi-Layer Perceptron in V-Shaped Read-Head Array BPMR Systems.** *K. Fatika*[1], S. Koonkarnkhai[2], P. Kovintavewat[2] and C. Warisarn[1] *1. College of Advanced Manufacturing Innovation, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand; 2. Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand*

IOB-12. **Trajectory Sampling Method for Reaction Rate Computation in Micromagnetic Simulations.** *X. Wang*[1], J. Duan[1] and V. Lomakin[1] *1. ECE, UCSD, La Jolla, CA, United States*

Session IPA
MAGNETIC RECORDING III
(Poster Session)

Dafine Ravelosona, Chair
Universite Paris Saclay, Palaiseau, France

IPA-01. **Small amount of grains with *c*-axis parallel to film plane and high saturation magnetization for FePt granular films with nitride grain boundary material for heat assisted magnetic recording media.** *K. Tham*[1], R. Kushibiki[1] and S. Saito[2] *1. Tanaka Kikinzoku Kogyo, Tsukuba, Japan; 2. Electronic Engineering, Tohoku University, Sendai, Japan*

IPA-02. **Combination dependence of printing characteristics in double magnet master media for energy-assisted magnetic recording.** *T. Komine*[1] *1. Graduate School of Science and Engineering, Ibaraki University, Ibaraki 316-8511, Japan*

IPA-03. **Evaluation of blocking temperature and its distribution for $L1_0$ typed FePt granular films.** *D. Isurugi*[1], T. Saito[1], S. Kaneko[1], K. Tham[2], T. Ogawa[1] and S. Saito[1] *1. Tohoku University, Sendai, Japan; 2. Tanaka Kikinzoku Kogyo K. K., Tsukuba, Japan*

IPA-04. **Numerical analysis of magnetization switching assisted by AC voltage-controlled magnetic anisotropy effect.** *X. Ya*[1], K. Kawakami[1] and T. Tanaka[1] *1. Kyushu University, Fukuoka, Japan*

IPA-05. **Magneto-optical observation of magnetic domain formation and drive in magnetic nanowire memory with topological insulator BiSb.** *M. Takahashi*[1], N. Nakatani[1], D. Kato[1], K. Ogura[1], Y. Iguchi[1], P. Nam Hai[2,3] and Y. Miyamoto[1,3] *1. NHK STRL, 1-10-11 Kinuta, Setagaya-ku, Japan; 2. Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Japan; 3. JST-CREST, 7 Goban-cho, Chiyoda-ku, Japan*

IPA-06. **Approximation of microwave assisted magnetization switching field applied with incident angle.** *K. Kawakami*[1], N. Narita[2], X. Ya[1] and T. Tanaka[1] *1. Kyushu University, Fukuoka, Japan; 2. Toshiba Corporation, Kawasaki, Japan*

IPA-07. **Writing domains in nanowires using a spin torque oscillator.** *S. Greaves*[1] and Y. Sonobe[2] *1. RIEC, Tohoku University, Sendai, Japan; 2. Research Organization for Nano & Life Innovation, Waseda University, Tokyo, Japan*

IPA-08. **Optimization of Two-Dimensional Generalized Partial Response Target Using Multi-Layer Perceptron for Bit Patterned Media Recording Systems.** *T.A. Nguyen*[1] and J. Lee[1] *1. Soongsil University, Seoul, The Republic of Korea*

Session JOA
AMORPHOUS AND NANOCRYSTALLINE SOFT MAGNETS I

Manuel Vázquez, Co-Chair
Instituto de Ciencia de Materiales de Madrid, Madrid, Spain
Charudatta Phatak, Co-Chair
Argonne National Laboratory, Lemont, IL, United States

JOA-01. **Magnetization process evaluation and tensile stress effect in direct magnetostriction measurement of amorphous microwires.** *M. Vázquez*[1] and J. Moya[2] *1. Institute of Materials Science of Madrid, CSIC, Madrid, Spain; 2. INTECIN UBA-CONICET, Universidad Católica de Salta, Salta, Argentina*

JOA-02. **Optimizing Laser Additive Manufacturing for Fe-based Amorphous Magnetostrictive Materials.** *M.G. Ozden*[1] and N. Morley[1] *1. Material Science and Engineering, University of Sheffield, Sheffield, United Kingdom*

JOA-03. **Design and in-situ Fabrication of Nano-crystalline Fe-Si-B-Co-Nb-Cu-Cr Ultra-thin Ribbons with Excellent Soft-magnetic Properties.** *H. Baghbaderani*[1], A. Masood[1], R. Sai[1], C. Ó Mathúna[1,2], P. Stamenov[1,3] and P. McCloskey[1] *1. Tyndall National Institute, Cork, Ireland; 2. University College Cork, Cork, Ireland; 3. Trinity College Dublin, Dublin, Ireland*

JOA-04. **Development of Novel FeCo based Amorphous FeCoBPSiCr Alloy with High B_s of 1.71T and High Corrosion Resistance.** *A. Hasegawa*[1], Y. Kajiura[1], M. Hosono[1], K. Yoshidome[1] and H. Matsumoto[1] *1. Materials Research Center, TDK Corporation, Narita, Japan*

JOA-05. **Effect of grain size on the core loss of nanocrystalline $Fe_{86}B_{13}Cu_1$ prepared by ultra-rapid annealing.** *H. Huang*[1], R. Parsons[1], H. Tsukahara[2,5], M. Yano[3], T. Shoji[3], A. Kato[3,4], K. Ono[2,5] and K. Suzuki[1] *1. Department of Materials Science and Engineering, Monash University, Clayton, VIC, Australia; 2. Institute of Materials Structure Science, High Energy Accelerator Research Organization, KEK, Tsukuba, Japan; 3. Toyota Motor Corporation, Susono, Japan; 4. National Institute for Materials Science, Sengen, Japan; 5. Department of Applied Physics, Graduate School Engineering, Osaka University, Suita, Japan*

JOA-06. **Controlling Devitrification in Amorphous FeSiB Using Static Magnetic Fields.** *X. Zhang*[1], E. Rinko[2,3], I. Anderson[2,3], M. Vázquez[4] and L. Lewis[1,5] *1. Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States; 3. Ames Laboratory, Ames, IA, United States; 4. Instituto de Ciencia de Materiales de Madrid (CSIC), Madrid, Spain; 5. Chemical Engineering, Northeastern University, Boston, MA, United States*

JOA-07. **Fabrication and soft magnetic properties of FeSiB-based flakes with insulating surface layer.** *R. Das*[1], L. Ye[1], H. Baghbaderani[1], P. McCloskey[1] and R. Sai[1]
1. Microsystems Centre, Tyndall National Institute, Cork, Ireland

JOA-08. **Substantial Thinning of Melt-Spun Ribbons by an Optimised and High-Yield Ball-Milling Process.** *L. Ye*[1], R. Das[1], H. Baghbaderani[1], P. McCloskey[1] and R. Sai[1]
1. MNS, Tyndall National Institute, Cork, Ireland

JOA-09. **Metal Amorphous Nanocomposite (MANC) $(Fe_xNi_yCo_{100-x-y})_{80}B_{14}Nb_4Si_2$ Magnetic Properties.** *K. Schneider*[1], Y. Krimer[2], S. Simizu[2], M. De Boer[1] and M. McHenry[2]
1. Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, PA, United States

JOA-10. **Properties Optimization for Manufacturing of Metal Amorphous Nanocomposite (MANC) Axial Motors.** *M. McHenry*[2], K. Schneider[1], Y. Krimer[2], J. Egbu[2], S. Simizu[2], M. De Boer[1], S. Bhattacharya[3] and E. Theisen[4]
1. Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 3. Electrical & Computer Engineering, North Carolina State University, Raleigh-Durham, NC, United States; 4. R&D, Metglas, Conway, SC, United States

JOA-11. **Effect of temperature on magnetic properties and magnetoimpedance effect in Fe-rich microwires.** *P. Corte-Leon*[1,2], I. Skorvanek[3], F. Andrejka[3], V. Zhukova[1,2], J. Blanco[2], M. Ipatov[1,2] and A. Zhukov[1,2] *1. Polymers and Advanced Materials: Physics, Chemistry and Technology, UPV/EHU, San Sebastian, Spain; 2. Applied Physics I, UPV/EHU, San Sebastian, Spain; 3. Slovak Academy of Science, Kosice, Slovakia*

JOA-12. **Magnetic properties and giant magnetoimpedance effect in multilayered microwires.** R. Lopez Antón[1], J. Andrés González[1], J. González Sanz[1], A. Garcia-Gomez[2], V. Zhukova[2], M. Ipatov[2], P. Corte-Leon[2] and *A. Zhukov*[2,3]
1. Instituto Regional de Investigación Científica Aplicada (IRICA) and Department of Applied Physics, University of Castilla-La Mancha, Ciudad Real, Spain; 2. Dept. Polymers and Advanced Mater., Dept. Appl. Phys. and EHU Quantum Center, Univercity of Basque Country, UPV/EHU, San Sebastian, Spain; 3. IKERBASQUE, Basque Foundation for Science, Bilbao, Spain

JOA-13. **Electronic structure and magnetization of epitaxial Fe_4N thin films probed using hard X-ray photoemission.** *S. Seema*[1], M. Gupta[2], A. Gupta[3], A. Hloskovsky[4] and M. Müller[1] *1. Fachbereich Physik, Universität Konstanz, Konstanz, Germany; 2. UGC-DAE Consortium for Scientific Research, Indore, India; 3. Physics Department, University of Petroleum and Energy Studies, Dehradun, India; 4. Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany*

JOA-14. **In-situ Magnetic Domain Behavior of Annealed Fe-Ni-based Soft Magnetic Alloys.** *C. Phatak*[1], V. Brajuskovic[1], A. Talaat[2], J. Egbu[3], K. Byerly[3], M. McHenry[3] and P. Ohodnicki[2] *1. Argonne National Laboratory, Lemont, IL, United States; 2. University of Pittsburgh, Pittsburgh, PA, United States; 3. Carnegie Mellon University, Pittsburgh, PA, United States*

JOA-15. **Study on Deterioration of Iron Loss of Amorphous Alloy by Wire Electrical Discharge Machining.** *B. Tian*[1], J. Wang[1], D. Ma[1], Y. Ma[1] and R. Pei[1] *1. Department of Electric Engineering, Shenyang University of Technology, Shenyang, China*

ORAL SESSIONS

Session JOB
FERRITES, GARNETS AND MAGNETO-DIELECTRIC MATERIALS I

Ramanathan Mahendiran, Chair
National University of Singapore, Singapore, Singapore

JOB-01. **Observation of the angular momentum compensation of ferrimagnetic material.** ***(Invited)*** *M. Imai*[1], H. Chudo[1], M. Matsuo[1,2], S. Maekawa[1,3] and E. Saitoh[1,4] *1. Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; 2. Kavli Institute for Theoretical Sciences, University of Chinese Academy of Sciences, Beijing, China; 3. Riken Center for Emergent Matter Science, Wako, Japan; 4. Department of Applied Physics, The University of Tokyo, Bunkyo, Japan*

JOB-02. **CMOS-compatible growth and investigation of room-temperature ferromagnetism in nanocrystalline zinc oxide-based dilute magnetic semiconductors.** *N. Joshi*[1], J. Narayan[1] and R. Narayan[1] *1. Materials Science and Engineering, North Carolina State University, Raleigh, NC, United States*

JOB-03. **Anisotropy Landscape Analysis in (110) Rare-earth Iron Garnet Films.** *Y. Song*[1], A. Kaczmarek[1], G. Beach[1] and C.A. Ross[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

JOB-04. **Combinatorial measurement of FMR in YIG-based magnetic garnet dots.** *Y. Omori*[1], H. Someya[1] and M. Ishida[1] *1. NEC Corporation, Tokyo, Japan*

JOB-05. **The Role of Co^{2+} Cation Addition in Enhancing the AC Heat Induction Power of $(Co_xMn_{1-x})Fe_2O_4$ Superparamagnetic Nanoparticles.** *J. Wang*[1], H. Kim[1], S. Ota[2], C. You[3], Y. Takemura[4] and S. Bae[1] *1. Electrical Engineering, University of South Carolina, Columbia, SC, United States; 2. Shizuoka University, Hamamatsu, Japan; 3. Daegu Gyeongbuk Institute of Science & Technology, Daegu, The Republic of Korea; 4. Yokohama National University, Yokohama, Japan*

JOB-06. **Synthesis of magnetic nanoparticles studied by synchrotron X-ray spectroscopy.** *J. Kuciakowski*[1,2], A. Kmita[2], K. Pitala[1,2], S. Lafuerza-Bielsa[3], M. Gajewska[2], J. Zukrowski[2], D. Koziej[4] and M. Sikora[2] *1. Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Krakow, Poland; 2. Academic Centre for Materials and Nanotechnology, AGH University of Science and Technology, Krakow, Poland; 3. European Synchrotron Radiation Facility, Grenoble, France; 4. Institute for Nanostructures and Solid States Physics, Center for Hybrid Nanostructures, University of Hamburg, Hamburg, Germany*

JOB-07. **Development of a Hafnium-Iron-Cobalt Ternary Alloy for Use in Thin Film Multiferroic Systems.** *M. Staruch*[1], T.R. Mion[1], K. Bussmann[1], O. Van't Erve[1], H. Ryou[1], S.B. Quadri[1] and P. Finkel[1] *1. Material Science and Technology, US Naval Research Laboratory, Washington, DC, United States*

JOB-08. **Correlation between orbital degree of freedom, lattice-striction and magneto-dielectric coupling in ferrimagnetic $Mn_{1.5}Cr_{1.5}O_4$.** *H. Chou*[1,2], G. Dwivedi[1], S. Kumawat[1,3], C. Wang[4] and D. Kakarla[1] *1. Department of Physics, and Center of Crystal Research, National Sun Yat-sen University, Kaohsiung, Taiwan; 2. Department of Applied Physics, National University of Kaohsiung, Kaohsiung, Taiwan; 3. International Ph.D. Program for Science (IPPS), National Sun Yat-sen University, Kaohsiung, Taiwan; 4. National Synchrotron Radiation Research Center, Hsinchu, Taiwan*

JOB-09. **Emerging Magneto-Dielectric Materials for 5G Antenna Miniaturization: 18H Hexaferrites.** *Q. Li*[1], Y. Chen[2] and V.G. Harris[3] *1. School of Materials and Energy, University of Electronic Science and Technology of China, Chengdu, China; 2. Innovation Center, Rogers Corporation, Burlington, MA, United States; 3. Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, United States*

JOB-10. **Withdrawn**

JOB-11. **Role of Composition and Oxygen in Ferrimagnetic Gd_xCo_{1-x} Alloys for Microwave/mm-Wave Non-Reciprocal Devices.** *K. Srinivasan*[1], Y. Chen[2], L. Cestarollo[2] and A. El-Ghazaly[1] *1. Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States; 2. Materials Science and Engineering, Cornell University, Ithaca, NY, United States*

JOB-12. **Investigation of Soft Magnetic Material Cores in Transcranial Magnetic Stimulation Coils and the Effect of Changing Core Shapes on the Induced Electrical Field in Small Animals.** *M. Tashli*[1], G. Weistroffer[2], M. Baron[3,4] and R.L. Hadimani[1,5] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Neurology, Virginia Commonwealth University, Richmond, VA, United States; 4. Hunter Holmes McGuire VA Medical Center, McGuire Research Institute, Richmond, VA, United States; 5. Dept. of Psychiatry, Harvard Medical School, Boston, MA, United States*

Session JOC
SOFT MAGNETIC CRYSTALLINE ALLOYS I
Victorino Franco, Chair
University of Seville, Seville, Spain

JOC-01. **Withdrawn**

JOC-02. **Application of electroplated Ni-Fe thick film to magnetostrictive material in vibration power generator.** *S. Aketa*[1], E. Ishikawa[1], Y. Nakamura[1], M. Ohtake[1], T. Kawai[1] and M. Futamoto[1] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan*

JOC-03. **$CoFeMn_{0.5}Al_x$: High magnetization CoFe based soft alloys with reduced Co content.** R. Rowan-Robinson[1], Z. Leong[1] and *N. Morley*[1] *1. University of Sheffield, Sheffield, United Kingdom*

JOC-04. **Systematic investigation of FeAlSi epitaxial films with excellent soft magnetic property.** *S. Akamatsu*[1], T. Nakano[1], M. Tsunoda[2,3], Y. Ando[1,2] and M. Oogane[1,2] *1. Department of Applied Physics, Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Center for Spintronics Research Network, Tohoku University, Sendai, Japan; 3. Department of Electronic Engineering, Graduate School of Engineering, Tohoku University, Sendai, Japan*

JOC-05. **The processability and physical properties of boron alloyed melt-spun Fe-6.5%Si ribbons.** *G. Ouyang*[1], M.J. Kramer[1], I. Anderson[1] and J. Cui[1] *1. Ames Laboratory of USDOE, AMES, IA, United States*

JOC-06. **Magnetostriction Property Modeling of Silicon Steel Considering Stress-induced and Magnetocrystalline Anisotropy.** *T. Ben*[1,2], Y. Kong[1], L. Chen[1] and F. Chen[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment and the Province-Ministry Joint Key Laboratory of EFEAR, Hebei University of Technology, Tianjin, China*

JOC-07. **Development of Dual Phase Soft Magnetic Laminate for Advanced Electric Machines.** *S. Huang*[1], M. Zou[2], W. Zhang[1], V. Rallabandi[3], S. Buresh[1], J. Zierer[1], L. Dial[1] and F. Johnson[4] *1. GE Research, Niskayuna, NY, United States; 2. Lab Magnetics, San Jose, CA, United States; 3. Oak Ridge National Lab, Oak Ridge, TN, United States; 4. Niron Magnetics, Inc., Minneapolis, MN, United States*

JOC-08. **Fabrication and Feasibility Study of Motor Laminations with Radially Varying Coercivity via Transverse Induction Annealing.** *T. Paplham*[1], M. Ghosh[1] 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*

JOC-09. **Magnetization of microwave synthesized $La_{0.7}Sr_{0.3}MnO_3$: Impacts of microwave power and dwelling time.** M. Marimuthu[1], Y.H. Lee[1] and *R. Mahendiran*[1] *1. Physics, National University of Singapore, Singapore, Singapore*

JOC-10. **Sharp Goss Texture and Magnetostriction in Primary Cold Rolled Fe-Ga Thin Sheets by Composite Precipitates.** *Z. He*[1], Z. Xinya[1], Y. Sha[2], X. Zhu[1] and F. Li[1] *1. School of Materials Science and Engineering, Shenyang University of Technology, Shenyang, China; 2. Key Laboratory for Anisotropy and Texture of Materials (Ministry of Education), Northeastern University, Shenyang, China*

POSTER SESSIONS

Session JPA
AMORPHOUS AND NANOCRYSTALLINE SOFT MAGNETS II (Poster Session)

Cristina Bran, Chair

Instituto de Ciencia de Materiales de Madrid, Madrid, Spain

JPA-01. **Composition and Oxidation Mechanism Optimization of FeNi-based Amorphous and Nanocomposite Alloys.** *J. Egbu*[1], J. Baltrus[3], S. Calderon[1], A. Talaat[2], P. Ohodnicki[2] and M. McHenry[1] *1. Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA, United States; 2. Mechanical Engineering and Materials Science, University of Pittsburgh, Pittsburgh, PA, United States; 3. National Energy Technology Laboratory, Pittsburgh, PA, United States*

JPA-02. **Withdrawn**

JPA-03. **Effect of Applied Stresses on Magnetic Properties of Co and Fe-rich Glass-coated Microwires.** *A. Garcia-Gomez*[1,2], P. Corte-Leon[1,2], M. Ipatov[1,2], V. Zhukova[1,2] and A. Zhukov[1,2] *1. Advanced Polymers and Materials: Physics, Chemistry and Technology, UPV/EHU, Donostia-San Sebastián, Spain; 2. Departament of Applied Physics, EIG, Universidad País Vasco, UPV/EHU, Donostia-San Sebastián, Spain*

JPA-04. **Current Annealing Dependence of Magnetic Properties of Thick Fe-rich Glass-coated Microwires with Different Lengths.** *A. Gonzalez Villegas*[1,2], P. Corte-Leon[1,2], V. Zhukova[1,2], A. Garcia-Gomez[1,2], M. Ipatov[1,2], J. Blanco[2] and A. Zhukov[1,2] *1. Advanced Polymers and Materials: Physics, Chemistry and Technology, Universidad del Pais Vasco, San Sebastian, Spain; 2. Department of Applied Physics, EIG, Universidad del Pais Vasco, San Sebastian, Spain*

JPA-05. **Controlled Domain Wall Interactions in Nearly Zero Magnetostrictive Amorphous Submicronic 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 R&D for Technical Physics, Iasi, Romania*

JPA-06. **Time-resolved MOKE Visualization of the Domain Wall in Microwire Combined with Induction Measurements.** *L. Fecova*[1], R. Varga[2] and K. Richter[2] *1. Institute of Physics, P. J. Safarik University, Kosice, Slovakia; 2. CPM-TIP, P. J. Safarik University, Kosice, Slovakia*

JPA-07. **Studies of FMR in amorphous glass–coated microwires.** *V. Zhukova*[1,2], P. Corte-Leon[1,2], C. Garcia[3], J. Gonzalez[1,2] and A. Zhukov[1,2] *1. Polymers and Advanced Materials: Physics, Chemistry and Technology, UPV/EHU, San Sebastian, Spain; 2. Applied Physics I, UPV/EHU, San Sebastian, Spain; 3. Physics, UTFSM, Valparaíso, Chile*

JPA-08. **Strip domains influenced high frequency permeabiltiy spectra in CoZrTaB thin films.** *G. Wei*[1], D. Lordan[1], A. Masood[1] and P. McCloskey[1] *1. Tyndall National Instititure, Cork, Ireland*

JPA-09. **Temperature dependent intrinsic Gilbert damping in magnetostrictive FeCoSiB thin film.** *W. Hu*[1], M. Huang[1] and F. Bai[1] *1. University of Electronic Science and Technology of China, Chengdu, China*

JPA-10. **Synthesis of Amorphous and Nanocrystalline Powders by a Three Jet Gas-Liquid Technique.** F. Borza[1], I. Murgulescu[1], M. Grigoras[1], H. Chiriac[1] and *N. Lupu*[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

JPA-11. **Magnetic Relaxation and Magnetic Resonance Effect of Mg-Zn Ferrite Nanoparticles.** S. Hamada[1], A. Usui[2], K. Ohara[1], K. Nakazawa[3], N. Kataoka[1] and *Y. Ichiyanagi*[1] *1. Physics, Yokohama National University, Yokohama, Japan; 2. Medicine, Tohoku University, Sendai, Japan; 3. Yokohama National University, Yokohama, Japan*

JPA-12. **Core Loss Measurement and Analysis for Soft Magnetic Materials Under Complex Non-Sinusoidal Excitations.** Y. Li[1], *S. Mu*[1], C. Zhang[1] and M. Yang[1] *1. Hebei University of Technology, Tianjin, China*

JPA-13. **Magnetic property measurement and analysis of high-frequency transformer core material under non-sinusoidal excitation considering temperature effect.** Y. Li[1], *C. Jin*[1], M. Yang[1], C. Zhang[1] and S. Mu[1] *1. College of Electrical Engineering, Hebei University of Technology, Tianjin, China*

JPA-14. **Loss Analysis of Magnetized Annealed Amorphous Alloy Applied to Stator Teeth.** *J. Wang*[1], B. Tian[1], H. Hu[1] and R. Pei[1] *1. Department of Electric Engineering, Shenyang University of Technology, Shenyang, China*

JPA-15. **A Study on Reducing Cogging Torque of 3-D Printing Axial Flux Motor using Fe-4.5Si-based Material.** M. Hong[1], H. Pyo[1], D. Nam[1] and *W. Kim*[1] *1. Gachon University, Seongnam-Si, The Republic of Korea*

POSTER SESSIONS

Session JPB
FERRITES, GARNETS AND MAGNETO-DIELECTRIC MATERIALS II
(Poster Session)

Chuanpu Liu, Chair
Colorado State University, Fort Collins, CO, United States

JPB-01. **Low- and High-field Spin-Hall Anomalous Hall Effect in Pt/TbIG with Epitaxial YAG Insert Layer.** *P. Li*[1], J. Liang[1], S. Ng[1] and C. Leung[1] *1. Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong, China*

JPB-02. **Magnetic domains of iron garnet film calculated by micromagnetic simulation.** *T. Goto*[1], T. Koguchi[1,2], M. Inoue[1], K. Ishiyama[1] and P. Lim[2] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Toyohashi University of Technology, Toyohashi, Japan*

JPB-03. **Field Dependent Magneto-Optical Spectra of Ferrimagnetic Garnets to Identify Magnetic Contributions.** *M. Vančík*[1], T. Fakhrul[2], K. Hayashi[2], J. Zázvorka[1], C.A. Ross[2] and M. Veis[1] *1. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 2. Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

JPB-04. **Two-step annealing and diffusion-driven exfoliation of cerium-doped terbium iron garnet on silicon substrates.** *P. Liu*[1] and K. Srinivasan[2,3] *1. Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 3. Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States*

JPB-05. **Design of Magnetization Yoke to Reduce the Number of Double Spoke Type PMSM Magnetization using I-Core.** *D. Nam*[1] and W. Kim[1] *1. Gachon University, SeongNam-si, The Republic of Korea*

JPB-06. **Annealing, low temperature superparamagnetic contributions and exchange bias in samarium substituted zinc ferrite nanoparticles.** *S. Ali*[1] and M. Zulqarnain[2] *1. School of Physical Sciences, University of the Punjab, Lahore, Pakistan; 2. Physics, The University of Lahore, Lahore, Pakistan*

JPB-07. **Magnetic and spin resonance studies of $Ni_xFe_{3-x}O_4$ ($0 \le x \le 0.7$) magnetic nano particles.** *K. Prajapati*[1], M. Khan[1] and G. Basheed[1] *1. BND, CSIR, New Delhi, India*

JPB-08. **The Role of Stoichiometry in $Mn_{1-x}Zn_x$ Ferrite Microwave Absorbers.** *A.S. Padgett*[1] *1. High Voltage Science and Experiment, Sandia National Laboratories, Albuquerque, NM, United States*

JPB-09. **Study of crystallite size on magnetic properties of nanocrystalline $FeCo_2O_4$.** *D. Verma*[1], A. Verma[1], T. Maitra[1] and G.D. Varma[1] *1. Physics, Indian Institute of Technology Roorkee, Roorkee, India*

JPB-10. **Magnetic Hyperthermia of AFe_2O_4 (A=Fe, Mn, Co) Nanoparticles Prepared by Co-precipitation Method.** A. Chandel[1], *Y. Kaur*[1] and B. Chudasama[1,2] *1. School of Physics and Material Science, Thapar Institute of Engineering and Technology, Patiala, India; 2. TIET-VT Center of Excellence in Emerging Materials, Thapar Institute of Engineering and Technology, Patiala, India*

JPB-11. **Structural, Magnetic and Magnetocaloric study of Cr doped $Gd_3Fe_{5-x}Cr_xO_{12}$, ($0.0 \le x \le 0.3$).** *J. Sultana*[1] *1. Physics, The University of Texas at Arlington, Arlington, TX, United States*

JPB-12. **Structural, Magnetic, and Magnetocaloric Study of Rare Earth-doped $Pr_{0.6-x}RE_xCa_{0.4}MnO_3$ (x=0.1; RE = Nd, Sm, Eu, and Y) Manganite Nanoparticles Synthesized via Autocombution Method.** *J. Sultana*[1] *1. Physics, University of Arkansas, Fayetteville, AR, United States*

JPB-13. **Structural, Magnetic, and Magnetocaloric effect in Al-doped $HoCrO_3$.** *J. Sultana*[1] *1. Physics, Buffalo State College, Buffalo, NY, United States*

JPB-14. **Effect of Oxidation on the Microwave Absorption Properties of Rare-earth Intermetallics $La_2Fe_4Co_{10}B$.** *K. Li*[1,2], Z. Liu[1], Y. Wang[1], P. Zhang[1], W. Yang[1], J. Han[1], S. Liu[1], C. Wang[1] and J. Yang[1] *1. State Key Laboratory for Mesoscopic Physics, Beijing, China; 2. Beijing Key Laboratory for Magnetoelectric Materials and Devices, Beijing, China*

JPB-15. **Withdrawn**

Session JPC
SOFT MAGNETIC CRYSTALLINE ALLOYS II (Poster Session)

Nicola Morley, Chair
University of Sheffield, Sheffield, United Kingdom

JPC-01. **First-order-reversal curve study of inhomogeneous microstructures in high-strain-rate deformed steels.** *S. Kobayashi*[1], A. Odeshi[2] and J. Szpunar[2] *1. Iwate university, Morioka, Japan; 2. University of Saskatchewan, Saskatoon, SK, Canada*

JPC-02. **Magnetic properties of Fe-Ni films deposited on a non-conductive substrate using an electroless plating method.** *R. Shiokawa*[1], Y. Hidaka[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan*

JPC-03. **Soft magnetic bilayer thin ribbons prepared using an electroplating method.** *Y. Yamaguchi*[1], Y. Hayashida[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan*

JPC-04. **Tunable magnetocrystalline anisotropy and high-frequency magnetic properties of $Y_2(Co_{1-x}Fe_x)_{17}$ and their composites.** *P. Zhang*[1,2], Y. Wang[1,2], C. Yun[1,2], W. Yang[1,2], C. Wang[1,2] and J. Yang[1,2] *1. State Key Laboratory for Mesoscopic Physics, School of Physics, Peking University, Beijing, China; 2. Beijing Key Laboratory for Magnetoelectric Materials and Devices, Beijing, China*

JPC-05. **The microwave absorption properties of several soft magnetic materials in frequency up to 40GHz.** *Y. Wang*[1,2], P. Zhang[1], Z. Liu[1], K. Li[1], W. Yang[1], J. Han[1], S. Liu[1], C. Wang[1] and J. Yang[1] *1. State Key Laboratory for Mesoscopic Physics, Beijing, China; 2. Beijing Key Laboratory for Magnetoelectric Materials and Devices, Beijing, China*

JPC-06. **Effect of Si/Al addition on magnetic properties of Fe-Co alloy.** *T. Sato*[1] and H. Takabayashi[1] *1. Research and Development Laboratory, Daido Steel Co., Ltd., Nagoya, Japan*

JPC-07. **Study on the Loss Characteristics of Silicon Steel with Different Si Content Considering the Effect of Temperature.** *D. Ma*[1], B. Tian[1] and R. Pei[1] *1. Department of Electric Engineering, Shenyang University of Technology, Shenyang, China*

JPC-08. **Measurement of magnetic properties of grain-oriented electrical steel under bending stress over a wide frequency range.** L. Chen[1], *D. Yan*[1], T. Ben[1], L. Jing[2] and Q. Liu[2] *1. China Three Gorges University, Yichang, China; 2. Hubei Provincial Research Center on Microgrid Engineering Technology, Yichang, China*

JPC-09. **Accurate calculation of global hysteresis properties of grain-oriented silicon steel based on an improved J-A model with variable parameters.** L. Chen[1], *X. Wen*[1], T. Ben[1], L. Jing[2] and Q. Liu[2] *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*

JPC-10. **A Study on the Supporter Removal Shape of Axial Flux Motor Using 3D Printing Processible Materials.** H. Pyo[1], Y. Lee[1], I. Yang[2] and *W. Kim*[1] *1. Electrical Engineering, Gachon University, Seongnam-Si, The Republic of Korea; 2. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea*

JPC-11. **Analysis of the Stator Magnetic Properties of an Aerospace Axial Flux Motor Considering the Thermal Stress of Material Lamination.** *J. Li*[1], D. Li[1], S. Xu[1] and R. Pei[1] *1. Department of Electric Engineering, Shenyang University of Technology, Shenyang, China*

ORAL SESSIONS

Session KOA

HARD MAGNETIC MATERIALS I: RARE EARTH-BASED COMPOUNDS

Thomas Schrefl, Chair

Danube University Krems, Wiener Neustadt, Austria

KOA-01. **Formation of $ThMn_{12}$-type Phase and Conditions for High Coercivity in (Sm,Zr)(Fe,Co,Ti)$_{12}$ Alloys.** ***(Invited)*** *A. Gabay*[1], C. Han[1], B. Lejeune[2], K. Jinn[2], C. Ni[1], L. Lewis[2] and G.C. Hadjipanayis[1,2] *1. University of Delaware, Newark, DE, United States; 2. Northeastern University, Boston, MA, United States*

KOA-02. **Development of rare-earth lean $SmFe_{12}$-based permanent magnets.** ***(Invited)*** *H. Sepehri-Amin*[1], J. Zhang[1], X. Tang[1], A. Srinithi[1], P. Tozman[1], A. Bolyachkin[1], T. Ohkubo[1] and K. Hono[1] *1. NIMS, Tsukuba, Japan*

KOA-03. **First-Principles Investigation of the Compositional Dependence of Exchange Interactions in $RETM_{12}$ Magnets.** *C.E. Patrick*[1], J.B. Staunton[2], A. Gabay[3], G.C. Hadjipanayis[4,3] and L. Lewis[4,5] *1. Department of Materials, University of Oxford, Oxford, United Kingdom; 2. Department of Physics, University of Warwick, Coventry, United Kingdom; 3. Department of Physics and Astronomy, University of Delaware, Newark, DE, United States; 4. Department of Chemical Engineering, Northeastern University, Boston, MA, United States; 5. Department of Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States*

KOA-04. **Enhancing stability and magnetism of $ThMn_{12}$-type cerium-iron intermetallics by site substitution[1].** C. Bhandari[1] and *D. Paudyal*[1] *1. Ames Lab, Ames, IA, United States*

KOA-05. **Investigation of the effect of V on the intrinsic and extrinsic magnetic properties of $Sm(Fe,V)_{12}$ by model thin film.** *P. Tozman*[1], H. Sepehri-Amin[1], T. Abe[1], A. Bolyachkin[1], T. Fukazawa[2], T. Miyake[2], S. Hirosawa[1], K. Hono[1] and Y. Takahashi[1] *1. National Institute for Materials Science, Tsukuba, Japan; 2. National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*

KOA-06. **From chemical composition and temperature to micromagnetic anisotropy and vice-versa.** *A. Kovacs*[1,2], A. Kornell[1,2], Q. Ali[1,2], J. Fischbacher[1,2], M. Gusenbauer[1,2], H. Oezelt[1,2], M. Yano[3], N. Sakuma[3], A. Kinoshita[3], T. Shoji[3], A. Kato[3] and T. Schrefl[1,2] *1. Christian Doppler Laboratory for Magnet design through physics informed machine learning, Viktor Kaplan-Straße 2E, 2700 Wiener Neustadt, Austria; 2. Department for Integrated Sensor Systems, Danube University Krems, Viktor Kaplan-Straße 2E, 2700 Wiener Neustadt, Austria; 3. Advanced Materials Engineering Div., Toyota Motor Corporation, 1200, Mishuku Susono, Shizuoka 410-1193, Japan*

KOA-07. **Interplay between magnetism and band topology in Kagome magnets RMn_6Sn_6.** Y. Lee[1], R. Skomski[2], X. Wang[3], P. Orth[1,4], A. Pathak[5], B. Harmon[1,4], R. McQueeney[1,4], I. Mazin[6] and *L. Ke*[1] *1. Ames Laboratory, Ames, IA, United States; 2. University of Nebraska, Lincoln, NE, United States; 3. Sophyics Technology, McLean, VA, United States; 4. Iowa State University, Ames, IA, United States; 5. SUNY Buffalo State, Buffalo, NY, United States; 6. George Mason University, Fairfax, VA, United States*

KOA-08. **Novel Quasi-trivalent Dual-main-phase Ce Magnets with High Performance Driven by Magnetic Anisotropy Energy Gap.** *Q. Sun*[1,2], M. Zhu[1,2] and W. Li[1] *1. Division of Functional Materials, Central Iron and Steel Research Institute, Beijing, China; 2. School of Materials Science and Engineering, Northeastern University, Shenyang, China*

KOA-09. **Discovery of a new high-T_c ferromagnet in Fe-rich Ce – Fe – Zr alloys.** *M. Nazmunnahar*[1], O. Palasyuk[1,2] and A. Palasyuk[1] *1. The Critical Materials Institute, Ames Laboratory (USDOE), Ames, Iowa, United States, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, Iowa, United States, IA, United States*

KOA-10. **Coercivity enhancement of PrCu diffused Dy-free-NdFeB sintered magnets.** *W. Tang*[1], G. Ouyang[1], J. Wang[1], M.J. Kramer[1,2], J. Cui[1,2] and I. Anderson[1,2] *1. Ames National Laboratory, Ames, IA, United States; 2. Materials Science & Engineering, Iowa State University, Ames, IA, United States*

KOA-11. **Phase stability and coercivity in $La_2Fe_{14}B$ magnet.** *X. Liu*[1] and C.I. Nlebedim[1] *1. Ames Laboratory, Ames, IA, United States*

KOA-12. **Near net shape fabrication of anisotropic Nd-Fe-B magnet using hot roll method.** *C. Pan*[1], G. Ouyang[2], W. Tang[2] and J. Cui[1,2] *1. Iowa State University, Ames, IA, United States; 2. Ames Laboratory, U.S. DOE, Ames, IA, United States*

KOA-13. **Development of low-temperature reduction-diffusion process using new reductant of Li-Ca eutectic melt.** *J. Kim*[1], S. Okada[1] and K. Takagi[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan*

KOA-14. **Mechanically robust high magnetic-performance Sm-Co sintered magnets through microstructure engineering.** *B. Cui*[1], X. Liu[1], C.I. Nlebedim[1] and J. Cui[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States*

ORAL SESSIONS

Session KOB

HARD MAGNETIC MATERIALS IV: RARE-EARTH FREE HARD MAGNETIC MATERIALS

Brian Lejeune, Chair

Northeastern University, Boston, MA, United States

KOB-01. **Integrated *ab initio* computational modelling of magnetic anisotropy and $L1_0$ order in non-critical transition metal magnets.** *J.B. Staunton*[1], B.J. Wieder[2], G. Fiete[2] and L. Lewis[3,4] *1. Physics, University of Warwick, Coventry, United Kingdom; 2. Physics, Northeastern University, Boston, MA, United States; 3. Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 4. Chemical Engineering, Northeastern University, Boston, MA, United States*

KOB-02. **Magnetic-Field-Driven Chemical Ordering in $L1_0$ Ferromagnetic Compounds.** *B. Lejeune*[1], X. Zhang[2], J.B. Staunton[3] and L. Lewis[1,2] *1. Chemical Engineering, Northeastern University, Boston, MA, United States; 2. Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 3. Physics, University of Warwick, Coventry, United Kingdom*

KOB-03. **Nanotwins assisted nitridation in FeNi nanopowders synthesized by induction thermal plasma.** *J. Wang*[1], Y. Hirayama[1], Z. Liu[2], K. Suzuki[1], W. Yamaguchi[1], K. Park[1], K. Takagi[1], H. Kura[3], E. Watanabe[3] and K. Ozaki[1] *1. Magnetic Powder Metallurgy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan; 2. Innovative Functional Materials Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan; 3. Advanced Research and Innovation Center, DENSO CORPORATION, Nagoya, Japan*

KOB-04. **Phase Stabilization and Coercivity Enhancement in Multi-principal Element FeCoNiMnCu Thin Films.** *W. Beeson*[1], H. Zhang[2,3], A. Davydov[2], G. Yin[1] and K. Liu[1] *1. Department of Physics, Georgetown University, Washington, DC, United States; 2. Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Theiss Research, Inc., La Jolla, CA, United States*

KOB-05. **Simulation of Thermal Decomposition of γ′-Fe_4N using Molecular Dynamics Method.** *J. Zhu*[1] and J. Wang[1] *1. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

KOB-06. **Withdrawn**

KOB-07. **Processing and characterization of melt-spun Nd-Fe-B ribbons for the preparation of hot deformation magnets.** *S. Singh*[1,2], A. Diraviam[2], R. Sarkar[2], A. Haldar[1] and M. Muthuvel[2] *1. Physics, Indian Institute of Technology Hyderabad, Hyderabad, India; 2. Defence metallurgical Research Laboratory, Hyderabad, India*

ORAL SESSIONS

Session KOC

HARD MAGNETIC MATERIALS VI: NANOSTRUCTURED, COMPOSITE AND OTHER HARD MAGNETIC MATERIALS (INCLUDING INTERMETALLIC ALLOYS AND L10 ALLOYS)

Chuanpu Liu, Chair

Colorado State University, Fort Collins, CO, United States

KOC-01. **Challenges and Opportunities for Manufacturing Novel Magnets.** *C.I. Nlebedim*[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States*

KOC-02. ***Ab initio*-based Thermodynamic Modeling for Sustainable Hard Magnetic Materials.** *H.I. Sözen*[1,2], T. Klüner[2] and T. Hickel[1,3] *1. Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany; 2. Carl von Ossietzky University, Oldenburg, Germany; 3. BAM Federal Institute for Materials Research and Testing, Berlin, Germany*

KOC-03. **Coercivity limits in nanoscale ferromagnets: Brown's paradox revisited.** J. Mohapatra[1], X. Meiying[1], J. Elkins[1] and *J. Liu*[1] *1. Department of Physics, The University of Texas at Arlington, Arlington, TX, United States*

KOC-04. **Tuning Magnetocrystalline Anisotropy of LTP-MnBi*.** *M. Choi*[1], Y. Hong[1], H. Won[1], C. Yeo[2], N. Shah[2], J. Lee[3], T. Lee[3] and T. Lim[3] *1. Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Mechanical Engineering, Texas Tech University, Lubbock, TX, United States; 3. Institute of Fundamental and Advanced Technology (IFAT), Hyundai Motor Company, Uiwang-si, The Republic of Korea*

KOC-05. **Bulk Rare Earth Free MnBi-based Permanent Magnets by Severe Plastic Deformation.** *L. Weissitsch*[1], S. Wurster[1], H. Krenn[2], R. Pippan[1] and A. Bachmaier[1] *1. Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences, Leoben, Austria; 2. Institute of Physics, University of Graz, Graz, Austria*

KOC-06. **Effects of Uniaxial Compressive Stress on Textured Grain Growth in Powder-based Alnico Magnet Alloys with an Engineered Microstructure.** *I. Anderson*[1,2], E. Rinko[2], N. Argibay[1] and M.J. Kramer[1,2] *1. Ames National Laboratory (USDOE), Ames, IA, United States; 2. Materials Science and Engineering, Iowa State University, Ames, IA, United States*

KOC-07. **Magnetic Behavior and Chaining of Strontium Ferrite-Nylon Composite Above the Melting Temperature.** *T. Ahmed*[1], C. Selsor[2], J. Tate[3] and W. Geerts[4] *1. Materials Science, Engineering, and Commercialization, Texas State University, San Marcos, TX, United States; 2. Aerospace Engineering, Texas A&M University, College Station, TX, United States; 3. Mechanical and Manufacturing Engineering, Texas State University, San Marcos, TX, United States; 4. Department of Physics, Texas State University, San Marcos, TX, United States*

KOC-08. **Magnetic and Structural Properties of Spark Plasma Sintered Strontium and Barium Hexaferrites.** *A. Sassi*[1], A. Pasko[1] and F. Mazaleyrat[1] *1. SATIE, ENS Paris-Saclay, 91190 Gif-sur-Yvette, France*

KOC-09. **Influence of Low Sintering Temperature of Substituted M-type Barium Hexaferrite on its Static and High Frequency Electromagnetic Properties.** *K. Rana*[1,3], M. Tomar[1] and A. Thakur[2,3] *1. Physics, Delhi University, Delhi, India; 2. Physics, Amity University, Gurugram, India; 3. Innovative Science Research Society, Shimla, India*

KOC-10. **$(Fe,Co)_2(P,Si)$ rare-earth free permanent magnets.** *F. Guillou*[1], B. Lingling-Bao[1], H. Yibole[1], W. Hanggai[2], N. van Dijk[2] and E. Brück[2] *1. Inner Mongolia Normal University, Hohhot, China; 2. FAME Group, Department of Radiation Science & Technology, Delft University of Technology, Delft, Netherlands*

POSTER SESSIONS

Session KPA

HARD MAGNETIC MATERIALS II: RARE EARTH-BASED COMPOUNDS (Poster Session)

Enric Menendez, Chair

Autonomous University of Barcelona, Cerdanyola del Vallès, Spain

KPA-01. **Effect of laser power on structural and magnetic properties of anisotropic Nd-Fe-B film magnets prepared by PLD method.** *A. Yamashita*[1], S. Hanada[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan*

KPA-02. **Investigation on crystallization process in isotropic rare-earth rich (Nd or Pr) -Fe-B films.** *I. Fukuda*[1], K. Higuchi[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan*

KPA-03. **Preparation of Nd-Fe-B film magnets with Nb additive using vacuum arc deposition.** *K. Otsuka*[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1], T. Shinshi[2] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan; 2. Tokyo Institute of Technology, Yokohama, Japan*

KPA-04. **Improvement in magnetic properties of Nd-Fe-B/glass two-layered films on Si substrates.** *K. Higuchi*[1], I. Fukuda[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1], T. Shinshi[2] and H. Fukunaga[1] *1. Nagasaki University, Nagasaki, Japan; 2. Tokyo Institute of Technology, Yokohama, Japan*

KPA-05. **Coercivity enhancement of hot-deformed NdFeB magnets by in-situ two-end-diffusion with $R_{70}Cu_{30}$ alloy powders (R = NdPr and Ce).** *Y. Wong*[1], W. Huang[1], H.W. Chang[1] and W. Chang[1] *1. Physics, National Chung Cheng University, Chiayi, Taiwan*

KPA-06. **High-coercivity HRE-free NdFeB sintered magnets developed by doping $Ce_{85}Al_{15}$ and grain boundary diffusion with $Pr_{70}Cu_{15}Al_{15}$.** *Y. Wong*[1], H.W. Chang[1], Y. Lee[1], W. Chang[1], C. Chiu[2] and C. Mo[3] *1. Physics, National Chung Cheng University, ChiaYi, Taiwan; 2. New Materials Research & Development Department, China Steel Corp., Kaohsiung, Taiwan; 3. R& D Department, Himag Magnetic Corporation, Pingtung, Taiwan*

KPA-07. **Effect of rotation rate on the recovery of Nd-Fe-B sludge via rotation-reduction diffusion method.** *L. Cong*[1], H. Xu[1], Q. Lu[1] and M. Yue[1] *1. Beijing university of technology, Beijing, China*

KPA-08. **Effect of Sm substitution on the structural and magnetic properties of $Nd_2Fe_{14}B$.** *Z. Lin*[1], G. Qiao[1], L. Qiao[2], W. Yang[1] and J. Yang[1,3] *1. School of Physics, Peking University, Beijing, China; 2. Institute of Applied Magnetics, Lanzhou University, Lanzhou, China; 3. Beijing Key Laboratory for Magnetoelectric Materials and Devices, Beijing, China*

KPA-09. **Suppression of the formation of soft magnetic phase for Sm(Fe-Co) thin films by introducing Sm seed layer.** *Y. Mori*[1], S. Nakatsuka[1], M. Kambayashi[1], S. Hatanaka[1], K. Hirayama[1], M. Doi[1] and T. Shima[1] *1. Tohoku-Gakuin Univ., Tagajo, Japan*

KPA-10. **Effect of Hydrogen Pressure and Temperature on Hydrogen Absorption Behavior of $Sm(CoFeCuZr)_z$ Strip-Casting Flake.** *J. Yang*[1,2], D. Zhang[1], Y. Li[1], C. Meng[1], J. Jia[1], W. Liu[1] and M. Yue[1] *1. Faculty of Materials and Manufacturing, Beijing University of Technology, Beijing, China; 2. School of Mechanical Engineering, Anyang Institute of Technology, Anyang, China*

KPA-11. **Effect of casting-alloy methods on magnetic properties of $Sm(CoFeCuZr)_z$ magnet.** *C. Meng*[1], J. Jia[1], D. Zhang[1], J. Yang[1,2], Y. Teng[1], Y. Li[1], W. Liu[1] and M. Yue[1] *1. Faculty of Materials and Manufacturing, Key Laboratory of Advanced Functional Materials, Ministry of Education of China, Beijing University of Technology, Beijing, China; 2. School of Mechanical Engineering, Anyang Institute of Technology, Anyang, China*

KPA-12. **Partitioning of alloying elements in Sm-Co-Fe-Cu-Zr magnet during the heat treatment.** *X. Liu*[1], B. Cui[1] and C.I. Nlebedim[1] *1. Ames Laboratory, Ames, IA, United States*

KPA-13. **Effects of zirconium and titanium additions on magnetic properties of $Sm(Fe,Co)_{10}$ melt-spun ribbons.** *T. Saito*[1] *1. Chiba Institute of Technology, Narashino, Japan*

KPA-14. **Study of the Anisotropic $Sm_2Fe_{17}N_3$ Powders with High Performance.** *D. Liang*[1], W. Yang[1], X. Wang[2], Q. Xu[1], J. Han[1], S. Liu[1], C. Wang[1], H. Du[1], Z. Luo[1] and J. Yang[1] *1. School of Physics, Peking University, Beijing, China; 2. Ningxia Magvalley Novel Materials Co., Yinchuan, China*

KPA-15. **Understanding the magnetism of multicomponent rare earth intermetallic compound $Tb_{0.33}Ho_{0.33}Er_{0.33}Ni$.** *A.P. Mohapatra*[1], A. Chelvane[2], A.V. Morozkin[3], S. Ramaprabhu[1] and R. Nirmala[1] *1. Department of Physics, Indian Institute of Technology Madras, Chennai, India; 2. Defence Metallurgical Research Laboratory, Hyderabad, India; 3. Department of Chemistry, Moscow Lomonosov State University, Moscow, Russian Federation*

KPA-16. **Development of rare-earth thick-film magnets applied to ultra-small stepping motors.** *K. Kouno*[1], A. Yamashita[1], T. Yanai[1], M. Nakano[1] and H. Fukunaga[1] *1. Nagasaki Univercity, Nagasaki, Japan*

POSTER SESSIONS

Session KPB
HARD MAGNETIC MATERIALS III: RARE EARTH-BASED COMPOUNDS (Poster Session)

Zheng Ma, Chair
Universitat Autònoma de Barcelona, Barcelona, Spain

KPB-01. **Withdrawn**

KPB-02. **A Study on Weight Reduction through Slotless SPMSM in High-Speed Operation.** *S. Lee*[1], S. Song[2], D. Kim[2], J. Min[1] and W. Kim[1] *1. Electrical Engineering, Gachon Universiy, Gyeonggi-do, The Republic of Korea; 2. Electrical Engineering, Hanyang University, Seoul, The Republic of Korea*

KPB-03. **A Study on the Optimization Characteristics of High-Speed Permanent Magnet Synchronous Motor Driveable in a Cryogenic Environment.** *D. Kim*[1], D. Kim[2], M. Jeong[1], S. Lee[1] and W. Kim[1] *1. Gachon University, Seongnam, The Republic of Korea; 2. Hanyang University, Seoul, The Republic of Korea*

KPB-04. **Design of Noiseless Motor through Application of New Materials and High-speed Operation.** *D. Kim*[1], D. Nam[2], J. Min[2], J. Lee[1] and W. Kim[2] *1. Hanyang University, Seoul, The Republic of Korea; 2. Gachon University, Seongnam, The Republic of Korea*

KPB-05. **Distinguishing Method of Local Demagnetization and Short-circuit Fault of Six-phase Interior Permanent-magnet Machine based on Voltage in Synchronous Frame.** *Z. Yuan*[1], M. Wang[1], J. Bai[1], W. Liu[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

KPB-06. **A study on the application of consequent poles to the STM model to reduce weight and use of magnets.** S. Song[1], S. Lee[2], J. Lee[1] and *W. Kim*[2] *1. Department of Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Department of Electrical Engineering, Gachon University, Seong-Nam, The Republic of Korea*

KPB-07. **A Study on the Combination of the Number of Poles and the Number of Slots in the Integral Magnetic Bearing for Uniform Rotor Control and the Number of Bearing Phases.** *M. Hong*[1], I. Yang[2], S. Song[2], D. Jung[3] and W. Kim[1] *1. Gachon University, Seongnam-Si, The Republic of Korea; 2. Hanyang University, Seoul-Si, The Republic of Korea; 3. Halla University, Won-Ju-Si, The Republic of Korea*

KPB-08. **Semi-physical Demagnetization Model for the Temperature Dependency of Permanent Magnets in Electrical Machines.** *A. Kern*[1], N. Leuning[1] and K. Hameyer[1] *1. Institute of Electrical Machines, RWTH Aachen University, Aachen, Germany*

KPB-09. **A Study on Shape Design to Improve Power of 200W Axial Flux Motor for Cooperative Robot.** J. Min[1], D. Nam[1], H. Pyo[1], N. Kang[1] and *W. Kim*[1] *1. Electrical Engineering, Gachon University, Seongnam, The Republic of Korea*

Session KPC
HARD MAGNETIC MATERIALS V: RARE-EARTH FREE HARD MAGNETIC MATERIALS (Poster Session)

Julius de Rojas, Chair
University of Durham, Durham, United Kingdom

KPC-01. **Maximum Energy Product of Exchange-coupled $Sm(FeCo)_{12}/\alpha$-Fe Nanocomposite Particle.** *R. Uda*[1], K. Koike[2], N. Inaba[3], H. Kato[2], M. Itakura[4], S. Okubo[5], H. Ohta[5] and H. Tsuchiura[6] *1. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan; 2. Applied Mathematics and Physics, Yamagata University, Yonezawa, Japan; 3. Informatics and Electronics, Yamagata University, Yonezawa, Japan; 4. Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Kasuga, Japan; 5. Molecular Photoscience Research Center, Kobe University, Kobe, Japan; 6. Applied Physics, Tohoku University, Sendai, Japan*

KPC-02. **Analysis of the Magnetic Hardening Mechanism in Hot-deformed Nano-heterostructure $SmCo_5$ Permanent Magnet.** *Y. Teng*[1], Y. Li[1], W. Liu[1], M. Yue[1] and D. Zhang[1] *1. Faculty of Materials and Manufacturing, Beijing University of Technology, Beijing, China*

KPC-03. **Bonded Magnets Development using Hydrogen Decrepitation.** *H.G. Parmar*[1], X. Liu[1], M. Paranthaman[2] and C.I. Nlebedim[1] *1. Critical Materials Institute, Ames Laboratory, Ames, IA, United States; 2. Critical Materials Institute, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

KPC-04. **Production of Nd-Fe-B bulk nanocomposite magnets by hot deformation.** *T. Saito*[1] and D. Hamane[2] *1. Chiba Institute of Technology, Narashino, Japan; 2. The University of Tokyo, Kashiwa, Japan*

KPC-05. **Constituent contribution to the magnetocrystalline anisotropy in $Mn(Al_{1-x}Ga_x)$.** *X. Liu*[1], D. Ryan[1] and Z. Altounian[1] *1. Physics, McGill University, Montreal, QC, Canada*

KPC-06. **Controlling Chemical Ordering in $L1_0$-type Permanent Magnet Compounds.** *X. Zhang*[1], B. Lejeune[2] and L. Lewis[1,2] *1. Mechanical and Industrial Engineering, Northeastern University, Boston, MA, United States; 2. Chemical Engineering, Northeastern University, Boston, MA, United States*

KPC-07. **Magnetic ordering in $CeCrGe_3$: magnetization and hyperfine interactions measurements.** *B.S. Corrêa*[1], W. Ferrira[1], A.A. Miranda-Filho[1], B. Bosch-Santos[1,2], E. Correa[1,2], G.A. Cabrera-Pasca[3,4] and A.W. Carbonari[1] *1. Instituto de Pesquisas Energéticas e Nucleares - IPEN, São Paulo, Brazil; 2. Material Measurement Laboratory, National Institute of Standards and Technology-NIST, Gaithersburg, MD, United States; 3. Programa de Pós-graduação em Ciência e engenharia de Materiais-PPGCEM, Ananindeua, Brazil; 4. Universidade Federal do Pará, Campus de Abaetetuba, Abaetetuba, Brazil*

KPC-08. **Effect of Hubbard *U* on Calculations of Magnetic Properties of α''–$Fe_{16}N_2$.** *P. Stoeckl*[1], P.W. Swatek[2] and J. Wang[2] *1. Physics, University of Minnesota, Minneapolis, MN, United States; 2. Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

KPC-09. **Structural and magnetic characterizations of La^{3+} and Li^{1+} co-substituted M-type strontium hexaferrite.** C. Kim[2] and *S. Yoon*[1] *1. Department of Physics, Gunsan National University, Gunsan, The Republic of Korea; 2. Department of Physics, Kookmin University, Seoul, The Republic of Korea*

POSTER SESSIONS

Session KPD

HARD MAGNETIC MATERIALS VII: NANOSTRUCTURED, COMPOSITE AND OTHER HARD MAGNETIC MATERIALS (INCLUDING INTERMETALLIC ALLOYS AND L10 ALLOYS) (Poster Session)

Xin Tang, Chair
NIMS, Tsukuba, Japan

KPD-01. **Study on preparation, structure and magnetic properties of high purity Mn_4C.** *F. Wang*[1], S. Fan[1], Z. Lin[1], H. Du[1], J. Han[1], W. Yang[1], S. Liu[1], C. Wang[1], Q. Xu[1], Y. Yang[1] and J. Yang[1] *1. Peking University, Beijing, China*

KPD-02. **Preparation and orientation control of FeMnS thin films with high saturation magnetization.** *R. Hikichi*[1], T. Shima[1] and M. Doi[1] *1. Tohoku Gakuin University, Tagajo, Japan*

KPD-03. **Understanding of the Phase Evolution with Temperature in Pure SrM, BaM and CaM.** *R. Liu*[1,2], X. Yu[3], L. Wang[2], Z. Xu[2], T. Zhao[3], F. Hu[3] and B. Shen[1] *1. School of Rare Earths, University of Science and Technology of China, Hefei, China; 2. Ganjiang Innovation Academy,Chinese Academy of Sciences, Ganzhou, China; 3. State Key Laboratory of Magnetism, Institute of Physics,Chinese Academy of Sciences, Beijing, China*

KPD-04. **Development of Mn based Permanent Magnet Material for Electric Motor.** *H. Lee*[1], T. Lee[1], J. Kim[2] and M. Kang[2] *1. R&D Division, Hyundai Motor, Uiwang-Si, The Republic of Korea; 2. Department of Materials Science and Chemical Engineering, Hanyang University, AnSan-Si, The Republic of Korea*

KPD-05. **Withdrawn**

KPD-06. **Withdrawn**

KPD-07. **A Study on the Shape of Polar Anisotropic Magnetizing Yoke to Reduce Dead Zone of Ring Magnet.** J. Min[1], D. Nam[1], H. Pyo[1], *S. Lee*[1] and W. Kim[1] *1. Department of Electrical Engineering, Gachon University, Seongnam, The Republic of Korea*

KPD-08. **Spoke-type Permanent Magnet Synchronous Generator Design for Wind Power Generator Considering Magnetization and Cogging Torque.** D. Kim[1], *S. Song*[1], H. Pyo[2], J. Lee[1] and W. Kim[2] *1. Hanyang University, Seoul, The Republic of Korea; 2. Gachon University, Seoungnam, The Republic of Korea*

KPD-09. **A Study on Performance Improvement by Reducing Axial Force of Double-layer Spoke-type PMSM with Core Skew Structure.** *D. Nam*[1], D. Kim[2], I. Yang[2] and W. Kim[1] *1. Gachon University, Seong-Nam, The Republic of Korea; 2. Hanyang University, Seong-Nam, The Republic of Korea*

KPD-10. **Design for minimizing irreversible demagnetization based on the back EMF contribution of a Dy-free magnet.** *S. Song*[1], H. Pyo[2], D. Nam[2], J. Lee[1] and W. Kim[2] *1. Department of Electrical Engineering, Hanyang University, Seoul, The Republic of Korea; 2. Department of Electrical Engineering, Gachon University, Seongnam, The Republic of Korea*

KPD-11. **A Study on Improving Post-assembly Magnetization Performance of Spoke-type Permanent Magnet Synchronous Motor.** *M. Jeong*[1], S. Song[1], H. Pyo[1], D. Kim[1] and W. Kim[1] *1. Gachon University, Seongnam-si, The Republic of Korea*

ORAL SESSIONS

Session LOA
THIN FILMS AND PATTERNED STRUCTURES

Franca Albertini, Chair
Institute of Materials for Electronics and Magnetism, National Research Council, Parma, Italy

LOA-01. **Direct Observation of Magnetic Ordering in Artificial Rhombus Spin Ice.** *T.R. Cote*[1,2], C. Phatak[1,2] and A. Petford-Long[1,2] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Materials Science & Engineering, Northwestern University, Evanston, IL, United States*

LOA-02. **Study of field-orientation dependent logic for bi-material L-shape patterned structures.** *R. An*[1,2], C.H. Leow[1,2], B. Myint[1,2] and V. Ng[1,2] *1. Information Storage Materials Laboratory, National University of Singapore, Singapore, Singapore; 2. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore*

LOA-03. **Effects of thermal fluctuations within and among the magnetic textures in artificial spin ice.** *S. Slöetjes*[1], B. Skovdal[1], M. Pohlit[1], H. Stopfel[1], B. Hjörvarsson[1] and V. Kapaklis[1] *1. Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden*

LOA-04. **Development of Dy μ-disks for coherent imaging of helimagnetic domains.** I. de Moraes[1], G. Beutier[2], L. Badie[3], D. Wermeille[4] and *K. Dumesnil*[3] *1. CEA, Grenoble, France; 2. SIMAP, Grenoble, France; 3. IJL, Nancy, France; 4. ESRF, Grenoble, France*

LOA-05. **Imaging thermally-induced Ising-vortex transformations in $La_{0.7}Sr_{0.3}MnO_3$-based artificial spin ices.** *D.Y. Sasaki*[1], M. Feng[1], I. Nihal[1], S.T. Retterer[2], A. Scholl[3], R. Chopdekar[3] and Y. Takamura[1] *1. Materials Science and Engineering, University of California, Davis, Davis, CA, United States; 2. Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 3. Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

LOA-06. **Structural and Magnetic Properties of Pt/Co/Mn Multilayers.** *M. Lonsky*[1,2], M. Yoo[1], Y. Huang[1], J. Qian[1], J. Zuo[1] and A. Hoffmann[1] *1. Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, United States; 2. Department of Physics, Goethe-University Frankfurt, Frankfurt, Germany*

LOA-07. **Tunable in-plane chirality via Interlayer DMI interactions in Synthetic Anti-Ferromagnets.** *M.A. Cascales Sandoval*[1], A. Hierro-Rodríguez[2,1], C. Donnelly[3], S. Ruiz Gómez[3,4], M. Niño[4], M. Foerster[4], D. McGrouther[1], E.Y. Vedmedenko[5], C. Leveille[6], N. Jaouen[6], S. Flewett[7] and A. Fernández-Pacheco[8,1] *1. University of Glasgow, Glasgow, United Kingdom; 2. Universidad de Oviedo, Oviedo, Spain; 3. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 4. ALBA Synchrotron, Cerdanyola del Vallés, Spain; 5. Institute of Applied Physics, University of Hamburg, Hamburg, Germany; 6. SOLEIL Synchrotron, Gif-Sur-Yvette, France; 7. Pontificia Universidad Católica de Chile, Santiago, Chile; 8. Instituto de Nanociencia y Materiales de Aragón CSIC, Zaragoza, Spain*

LOA-08. **Strong Bulk Spin-orbit Torque Effect Enabled by Microstructural Disordering.** *Y. Huang*[1], H. Chen[1], J. Lin[2], Y. Huang[2] and Y. Tseng[1] *1. National Yang Ming Chiao Tung University, Hsin-Chu, Taiwan; 2. National Synchrotron Radiation Research Center, Hsin-Chu, Taiwan*

LOA-09. **The impact of the Fe layer thickness on the interlayer exchange coupling in $[Fe/MgO]_N$ (100) superlattices.**
A.L. Ravensburg[1], G.K. Pálsson[1], V. Ukleev[2], J. Stahn[3], B. Hjörvarsson[1], A. Vorobiev[4] and V. Kapaklis[1] *1. Physics and Astronomy, Uppsala University, Uppsala, Sweden; 2. Spin and Topology in Quantum Materials, Helmholtz-Zentrum Berlin for Materials and Energy, Berlin, Germany; 3. Paul Scherrer Institut, Villigen, Switzerland; 4. Institut Laue-Langevin, Grenoble, France*

LOA-10. **Frequency Tunability with Field-Angle in Hybrid-Anisotropy $[CoPd]_8$-Pd-NiFe Magnetic Multilayers.**
J. Leon[1], D. Bangay[1], N.A. Johansson[1], H.J. Waring[1] and T. Thomson[1] *1. Computer Science, University of Manchester, Manchester, United Kingdom*

LOA-11. **Investigation of van der Waals $Fe_5GeTe_2/NiPS_3$ ferromagnet/antiferromagnet heterostructure.** *T. Wang*[1], Q. Li[2], M. Yang[3], A. N'Diaye[4], C. Klewe[4], X. Huang[5], H. Zhang[5], P. Shafer[4], X. Zhang[6], C. Hwang[7], R. Ramesh[5] and Z.Q. Qiu[1] *1. Physics, University of California Berkeley, Berkeley, CA, United States; 2. University of Science and Technology of China, Hefei, China; 3. Anhui University, Hefei, China; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States; 5. Materials Science & Engineering, University of California Berkeley, Berkeley, CA, United States; 6. King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 7. Korea Institute of Science and Technology, Seoul, The Republic of Korea*

LOA-12. **Introduction of nitride underlayer and caplayer for preparation of Mn_4N(001) single-crystal thin film with perpendicular magnetic anisotropy.** *K. Imamura*[1], M. Ohtake[1], S. Isogami[2], M. Futamoto[1], T. Kawai[1], F. Kirino[3] and N. Inaba[4] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Research Center for Magnetic and Spintronic Materials, National Institute for Materials Science (NIMS), Tsukuba, Japan; 3. Graduate School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan; 4. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

LOA-13. **Study of Amorphous CoFeB Film Interfaced with Heavy Metals using Magnetic Circular Dichroism in Hard X-Ray Photoemission.** *A. Hloskovsky*[1], C. Schlueter[1], M. Singh[2], K. Sarathlal[2], M. Gupta[3], V. Reddy[3] and A. Gupta[2] *1. Photon Science, Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany; 2. Physics Department, University of Petroleum and Energy Studies, Dehradun, India; 3. UGC-DAE Consortium for Scientific Research, Indore, India*

LOA-14. **Fabrication of 3 nm Width Dielectric Segregant Lines for Radially Ordered Grain Pattern Media Recording.**
X. Yang[1], *S. Xiao*[1], J. Wu[1], Y. Hsu[1], Z. Yu[1], D. Staaks[1], P. Steiner[1], K. Lee[1] and T.Y. Chang[1] *1. Seagate Media Research, Fremont, CA, United States*

Session LOB
THIN FILMS AND SURFACE EFFECTS

Paola Tiberto, Co-Chair
INRIM, Torino, Italy
Joao Paulo Sinnecker, Co-Chair
Centro Brasileiro de Pesquisas Físicas, Rio de Janeiro, Brazil

LOB-01. **Interface Degradation in Magnetic Multilayer Stacks Characterised by X-Ray Reflectometry and Polarised Neutron Reflectometry.** *B.W. Wilson*[1], Y. Khaydukov[2], J. Scott[1], W. Hendren[1], A. Vorobiev[3], A. Dobrynin[4] and R. Bowman[1] *1. School of Mathematics and Physics, Queen's University Belfast, Belfast, United Kingdom; 2. Max Planck Institute for Solid State Research, Stuttgart, Germany; 3. Departent of Physics and Astronomy, Uppsala University, Uppsala, Sweden; 4. Seagate Technology, Derry, United Kingdom*

LOB-02. **Fabrication of $Co_{25}Fe_{75}$/Hf multilayer thin films to decrease the magnetic damping coefficient.** *S.C. Mills*[1] and M. Staruch[1] *1. Materials Science and Technology, U.S. Naval Research Laboratory, Washington, DC, United States*

LOB-03. **Tailoring Perpendicular Magnetic Anisotropy of Cobalt-Iron alloy (CoFeB) Using Ion Irradiation.** *A. Mahendra*[1,2], P. Murmu[2,3], S. Acharya[1,3], A. Islam[1,3], P. Gupta[2,3], S. Granville[1,3] and J. Kennedy[2,3] *1. Robinson Research Institute, Victoria University of Wellington, Wellington, New Zealand; 2. National Isotope Centre, GNS Science, Lower Hutt, New Zealand; 3. The MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*

LOB-04. **Modifying the Magnetic Properties of Polycrystalline Co Thin Films by a Molecular Interface.** *M. Benini*[1], G. Allodi[2], G. Varvaro[3], A. Surpi[1], R.K. Rakshit[1], K. Lin[4], L. Gnoli[1], A. Riminucci[1], M. Singh[1], S. Sanna[5], I. Bergenti[1] and V. Dediu[1] *1. CNR-ISMN, Bologna, Italy; 2. Dipartimento di Scienze Matematiche, Fisiche e Informatiche, University of Parma, Parma, Italy; 3. Institute of Structure of Matter, Consiglio Nazionale delle Ricerche, Rome, Italy; 4. Department of Materials Science and Engineering, NCHU, Taichung, Taiwan; 5. Department of Physics and Astronomy, University of Bologna, Bologna, Italy*

LOB-05. **Magnetostrictive properties of flat Fe-Co epitaxial films grown on VN(001) single-crystal underlayers.** *Y. Nakamura*[1], M. Ohtake[1], T. Kawai[1], M. Futamoto[1], F. Kirino[2] and N. Inaba[3] *1. Faculty of Engineering, Yokohama National University, Yokohama, Japan; 2. Gradute School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan; 3. Graduate School of Science and Engineering, Yamagata University, Yonezawa, Japan*

LOB-06. **In-depth structural and magnetic study of Ni/NiO epitaxial thin films on various single crystalline substrates grown using pulsed laser deposition.** *M. Iqbal*[1] and K. Ghosh[1] *1. Physics, Astronomy and Materials Science, Missouri State University, Springfield, MO, United States*

LOB-07. **Perpendicular Magnetic Anisotropy of Ferrimagnetic Mn_4N Thin Film Improved by the Pd Buffer Layer.** *Y. Zhang*[1] and S. Granville[1] *1. Victoria University of Wellington, Wellington, New Zealand*

LOB-08. **Determining Quantitatively the Induced Magnetic Moment in Graphene by Polarised Neutron Reflectivity and X-ray Magnetic Circular Dichroism.** *R. Aboljadayel*[1,2], C. Kinane[3], C.A. Vaz[4], D.M. Love[2], R. Weatherup[5], P. Braeuninger-Weimer[5], M. Martin[5], A. Ionescu[2], A. Caruana[3], T. Charlton[3], J. Llandro[2], P.M. Monteiro[2], C.H. Barnes[2], S. Langridge[3] and S. Hofmann[5] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Cavendish Laboratory, physics department, University of Cambridge, Cambridge, United Kingdom; 3. STFC Rutherford Appleton Laboratory, ISIS Neutron and Muon Source Facility, Harwell, United Kingdom; 4. Swiss Light Source, Paul Scherrer Institut, Villigen PSI, Switzerland; 5. Department of Engineering, University of Cambridge, Cambridge, United Kingdom*

LOB-09. **The Effect of Cap Materials and Cooling Time on the Magnetic Properties of Ferrimagnetic $(FeCo)_{(1-y)}Gd_y$ Thin Films.** *N. Alzahrani*[1,2], D. Khan[1] and D. Arena[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. Physics, University of Jeddah, Jeddah, Saudi Arabia*

LOB-10. **Towards Optimised Tunable NiFe Multilayers for High-Frequency Applications.** *M.R. McMaster*[1], W. Hendren[1], J. Scott[1] and R. Bowman[1] *1. Mathematics and Physics, Queen's University Belfast, Belfast, United Kingdom*

LOB-11. **Quantification of Micromagnetic Parameters in Ultrathin Asymmetrically Sandwiched Magnetic Thin Films.** *O.M. Volkov*[1], I.A. Yastremsky[2], O. Pylypovskyi[1], F. Kronast[3], C. Abert[4], E. Oliveros Mata[1], P. Makushko[1], M. Mawass[3], V.P. Kravchuk[5], D.D. Sheka[2], B.A. Ivanov[2,6], J. Fassbender[1] and D. Makarov[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Faculty of Radio Physics, Electronics and Computer Systems, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; 3. Helmholtz-Zentrum Berlin, Berlin, Germany; 4. Faculty of Physics, University of Vienna, Vienna, Germany; 5. Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany; 6. Institute of Magnetism, National Academy of Sciences and Ministry of Education and Science, Kyiv, Ukraine*

LOB-12. **Growth-Induced Order in Anisotropic Mixed Rare-Earth Iron Garnet Thin Films.** *A. Kaczmarek*[1], Y. Song[1], E.R. Rosenberg[1], G. Beach[1] and C.A. Ross[1] *1. Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States*

LOB-13. **High-coercive PrFeB Films with Strong Perpendicular Magnetic Anisotropy.** *J. Soler Morala*[1], C. Navio[1], G. Gkouzia[4], P. Pedraz[1], L. Zha[2,3], J. Yang[2,3], L. Alff[4] and A. Bollero[1] *1. IMDEA Nanociencia, Madrid, Spain; 2. Beijing Key Laboratory for Magnetoelectric Materials and Devices, Beijing, China; 3. State Key Laboratory for Mesoscopic Physics, Peking University, Beijing, China; 4. Materials science, Technische Universität Darmstadt, Darmstadt, Germany*

LOB-14. **Chirality-induced asymmetric magnetization reversal in perpendicularly exchange biased micro stripes.** *S. Akhundzada*[1], P. Kuswik[3], M. Kowacz[3], C. Janzen[1], T. Mewes[2], A. Ehresmann[1] and M. Vogel[1] *1. Institute of Physics and Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Kassel, Germany; 2. Department of Physics and Astronomy, University of Alabama, Tuscaloosa, AL, United States; 3. Institute of Molecular Physics, Polish Academy of Sciences, Poznan, Poland*

POSTER SESSIONS

Session LPA
STRUCTURED MATERIALS (Poster Session)

Yu Shiratsuchi, Chair
Osaka University, Osaka, Japan

LPA-01. **Withdrawn**

LPA-02. **Doping Dependent Coercive Field in the Reduced Dimensional System $La_{1-x}Sr_xMnO_3$ ($0.04 \le x \le 0.5$).** *T.M. Pekarek*[1], K. Taylor[1], C.T. Bryant[1], R. Marquez Tavera[1], J. Payne[1], D. Brown[1] and M.P. Warusawithana[1] *1. Physics, University of N. Florida, Jacksonville, FL, United States*

LPA-03. **Element-specific magnetocrystalline anisotropy of Sm-Co thin films.** *G. Gkouzia*[1], D. Günzing[2], R. Xie[1], T. Wessels[2,3], M. Major[1], A. N'Diaye[4], H. Zhang[1], H. Wende[2], K. Ollefs[2] and L. Alff[1] *1. Materials Science, Technical University of Darmstadt, Darmstadt, Germany; 2. Faculty of Physics and Center for Nanointegration (CENIDE), University of Duisburg-Essen, Duisburg, Germany; 3. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Gruenberg Institute, Juelich, Germany; 4. Lawrence Berkeley National Laboratory, Berkeley, CA, United States*

LPA-04. **Magnetic, optical and magneto-optical properties of strain-free $La_{2/3}Sr_{1/3}MnO_3$ thin films on Si substrates with $Ca_2Nb_3O_{10}$ nanosheet seed layer.** *T. Maleček*[1], T. Maroutian[2], G. Agnus[2], L. Horák[1], A. Melzer[1], P. Lecoeur[2] and M. Veis[1] *1. Faculty of Mathematics and Physics, Charles University, Prague, Czechia; 2. Centre for Nanoscience and Nanotechnology (C2N), Palaiseau, France*

LPA-05. **Strong Perpendicular Magnetic Anisotropy in Co/Pt and Co/Pd Synthetic Antiferromagnets.** *M. Caseiro*[1,2], R. Macedo[1], P. Araujo[1,2], S. Cardoso[1,2], M. Erkovan[1] and P. Freitas[1,2] *1. INESC MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal*

LPA-06. **Fabrication of β-Mn type CoZnMn(001) film on MgO single crystal substrate.** *D. Oshima*[1], R. Mitsuhashi[1], N. Ikarashi[2], T. Kato[2] and M. Nagao[2] *1. Electronics, Nagoya University, Nagoya, Japan; 2. Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan*

LPA-07. **Withdrawn**

LPA-08. **Inhomogeneous strain induced new interfacial phase of $La_{0.7}Sr_{0.3}MnO_3$ thin film.** S.P. Pati[1], T. Usami[1], S. Komori[1] and *T. Taniyama*[1] *1. Department of Physics, Nagoya University, Nagoya, Japan*

LPA-09. **Growth temperature-controlled Gilbert damping and anisotropies in PLD grown epitaxial Co_2FeSi Heusler alloy thin film.** V. Sharma[2], P. Kumar[2], V. Sharma[1] and *B.K. Kuanr*[2] *1. Department of Physics, Morgan State University, Baltimore, MD, United States; 2. Special Centre for Nanoscience, Jawaharlal Nehru University, New Delhi, India*

LPA-10. **Control of grain orientation spread and inhomogeneous broadening in $L1_0$ -phase FePd thin films with low damping and high perpendicular magnetic anisotropy.** *J.E. Shoup*[1,3], J.A. Borchers[2], J. Wang[4], D. Arena[1] and D.B. Gopman[3] *1. University of South Florida, Tampa, FL, United States; 2. NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, United States; 3. Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD, United States; 4. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States*

LPA-11. **Modification and control of magnetic properties of multilayer systems via buffer layer.** *J. Názvorka*[1], C. Verbeno[1], L. Nowak[1] and M. Veis[1] *1. Faculty of Mathematics and Physics, Institute of Physics, Charles University, Prague, Czechia*

LPA-12. **Antiferromagnetically coupled CoFe/MgO/CoFe Thin Films.** *S. Ahn*[1,2] *1. Center for Semiconductor Technology Convergence, University of Science and Technology (POSTECH), Pohang, Gyeongbuk, The Republic of Korea; 2. Department of Electrical Engineering, University of Science and Technology (POSTECH), Pohang, Gyeongbuk, The Republic of Korea*

LPA-13. **Surface effects and spatial distribution of magnetic properties in a Kagomé artificial spin ice.** B.M. Cecchi[1], R. Lourenço[2], J.G. Fernandez[4], M. Velo[1], L. Soares[1], N. Cruz[1], J. Marqués Marchán[3], M. Vázquez[3], A. Asenjo[3], M. Knobel[1], D.N. Otero[3], W. Macedo[2], V.M. Prida[4] and *K.R. Pirota*[1] *1. Condensed Matter Physics, UNICAMP, Campinas, Brazil; 2. CDTN, Belo Horizonte, Brazil; 3. ICMM (CSIC), Madrid, Spain; 4. Universidad de Oviedo, Oviedo, Spain*

LPA-14. **Mechanical magnetostriction effect of Permalloy dots depending on aspect ratio and bending direction.** N. Kim[1] and *S. Yoon*[1] *1. Korea Institute of Industrial Technology, Gwangju, The Republic of Korea*

ORAL SESSIONS

Session MOA
NANOCOMPOSITE MAGNETIC MATERIALS

Johan van Lierop, Co-Chair
University of Manitoba, Winnipeg, MB, Canada
Amal El-Ghazaly, Co-Chair
Cornell University, Ithaca, NY, United States

MOA-01. **Nucleation and Motion of Domain Walls in Cylindrical Nanowires.** ***(Invited)*** *C. Bran*[1], J. Fernandez-Roldan[1,2], E. Saugar[1], R. P. del Real[1], A. Asenjo[1], M. Vázquez[1] and O. Chubykalo-Fesenko[1] *1. Instituto de Ciencia de Materiales de Madrid (ICMM - CSIC), Madrid, Spain; 2. Helmholtz-Zentrum Dresden-Rossendorf e. V. (HZDR), Dresden, Germany*

MOA-02. **Induced exchange bias in a single layer FeRh thin film by a single step Fe^+ ion irradiation.** C. Cress[2], O. Van't Erve[1], J. Prestigiacomo[1], S. LaGasse[2], A. Glavic[3], V. Lauter[4] and *S.P. Bennett*[1] *1. Materials Science and Technology Division, The US Naval Research Laboratory, Washington, DC, United States; 2. Electronics Science and Technology Division, The US Naval Research Laboratory, Washington, DC, United States; 3. Paul Scherrer Institute, Villigen, Switzerland; 4. Neutron Sciences Directorate, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

MOA-03. **NiFe/FeMn based exchange bias system for bias-field-free magnonic medium.** *B. Panigrahi*[1], M. Muthuvel[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 Hyderabad, Sangareddy, India*

MOA-04. **Role of Mn Interfacial Layers on Ir/Mn Exchange Bias Systems.** *W.J. Frost*[1], J. Gompertz[1], R. Carpenter[3,2], S. Hassan[3], M.W. Ormston[3], K. O'Grady[1] and G. Vallejo-Fernandez[1] *1. Department of Physics, University of York, York, United Kingdom; 2. imec, Leuven, Belgium; 3. Seagate Technology, Londonderry, United Kingdom*

MOA-05. **The effect of x-ray illumination on magnetic domain memory in [Co/Pd] / IrMn multilayers.** *C.S. Walker*[1], M. Parkes[2], T. Anderson[1], D. Keavney[3], E. Fullerton[4] and K. Chesnel[1] *1. Physics, Brigham Young University, Provo, UT, United States; 2. Auburn University, Auburn, AL, United States; 3. Advanced Photon Source, Lemont, IL, United States; 4. Center for Memory and Recording research, UCSD, San Diego, CA, United States*

MOA-06. **Analysis of the Magnetic Interactions in FeNi Nanowire Arrays through FORC and Angular Coercivity Measurements.** *A.J. Campos-Hernandez*[1], E.M. Palmero[1] and A. Bollero[1] *1. Permanent Magnets and Applications Group, IMDEA Nanociencia, Madrid, Spain*

MOA-07. **Magnetization Reversal in Cylindrical NiFe Nanowires.** *V. Brajuskovic*[1], A.R. McCray[1,2], Y. Zhang[3] and C. Phatak[1] *1. Materials Science Division, Argonne National Laboratory, Lemont, IL, United States; 2. Applied Physics Program, Northwestern University, Evanston, IL, United States; 3. Applied Materials Division, Argonne National Laboratory, Lemont, IL, United States*

MOA-08. **Controlling Spin Stability in Three-Dimensional Bi-material Nanostructures.** *C.H. Leow*[1,2], B. Myint[1,2] and V. Ng[1,2] *1. Information Storage Materials Laboratory, National University of Singapore, Singapore, Singapore; 2. Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore*

MOA-09. **Size-dependent Magnetization Reversal Characteristics of Synthetic Antiferromagnetic Nanoplatelets.** *J. Li*[1], W. Sijtsma[1], B. Koopmans[1] and R. Lavrijsen[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands*

MOA-10. **Formation of magnetic nanowire arrays by cooperative lateral growth.** *F. Chen*[1], Z. Yang[1], J. Li[1], F. Jia[1], F. Wang[1], D. Zhao[1], R. Peng[1] and M. Wang[1,2] *1. Nanjing University, Nanjing, China; 2. American Physical Society, New York, NY, United States*

MOA-11. **Modulating Oxygen Octahedra Tiltings in ε-Fe_2O_3 Nanoparticles using Transition-metal Doping.** *R. Nickel*[1*], M.M. Shepit[1], C. Sun[2], D. Motta Meira[2] and J. van Lierop[1] *1. Physics & Astronomy, University of Manitoba, Winnipeg, MB, Canada; 2. Argonne National Laboratory, Argonne, IL, United States*

MOA-12. **Exploring Magnetic Nanochain Anisotropy for Flexible Composite Micro-Actuators.** *Y. Chen*[1*] and A. El-Ghazaly[2] *1. Materials Science and Engineering, Cornell University, Ithaca, NY, United States; 2. Electrical and Computer Engineering, Cornell University, Ithaca, NY, United States*

MOA-13. **Domain Wall Automotion for Three-Dimensional Magnetic Interconnectivity.** L. Skoric[1], C. Donnelly[2], A. Hierro-Rodríguez[4], M.A. Cascales Sandoval[3], S. Ruiz-Gómez[2], M. Foerster[5], M. Niño[5], R. Belkhou[6], C. Abert[7], D. Suess[7] and *A. Fernández-Pacheco*[8] *1. University of Cambridge, Cambridge, United Kingdom; 2. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 3. University of Glasgow, Glasgow, United Kingdom; 4. University of Oviedo, Oviedo, Spain; 5. ALBA synchrotron, Barcelona, Spain; 6. SOLEIL Synchrotron, Paris, France; 7. University of Vienna, Vienna, Austria; 8. CSIC-University of Zaragoza, Zaragoza, Spain*

MOA-14. **Local and Nonlocal Curvature-induced Chiral Effects in Nanomagnetism.** *O.M. Volkov*[1], O. Pylypovskyi[1], A. Kakay[1], V.P. Kravchuk[2], D.D. Sheka[3], J. Fassbender[1] and D. Makarov[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Karlsruher Institut für Technologie (KIT), Karlsruher, Germany; 3. Faculty of Radio Physics, Electronics and Computer Systems, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

POSTER SESSIONS

Session MPA
NANOPARTICLES, EXCHANGE BIAS AND 3D STRUCTURES (Poster Session)

Charudatta Phatak, Chair
Argonne National Laboratory, Lemont, IL, United States

MPA-01. **Effect of thermal cycling on exchange bias in NiFe/IrMn bilayers.** *A.D. Talantsev*[1], M. Bakhmetiev[1] and R. Morgunov[1] *1. Magnetic and Spin Logic Devices, Institute of Problems of Chemical Physics, Moscow, Russian Federation*

MPA-02. **Effect of ion-irradiation and thermal annealing on Exchange bias and the training effect in FeCo/NiO bilayers.** *R. Gupta*[1], K. Sriram[1], A. Lakhani[2], V. Reddy[2], F. Singh[3] and A. Gupta[4] *1. School of Instrumentation, Devi Ahilya Vishwavidyalaya, Indore, India; 2. UGC DAE CSR, Indore, India; 3. Inter University Accelerator Center, New Delhi, India; 4. Physics, University of Petroleum and Energy Studies, Dehradun, India*

MPA-03. **Understanding magnetization reversal mechanisms and exchange interactions in nanostructured cobalt ferrites using first order reversal curves (FORC).** *S.V. Mullurkara*[1], R. Egli[2], B.C. Dodrill[3], S. Tan[4,5] and P. Ohodnicki[1,5] *1. MEMS, University of Pittsburgh, Pittsburgh, PA, United States; 2. Zentralanstalt für Meteorologie und Geodynamik (ZAMG), Vienna, Austria; 3. Lake Shore Cryotronics, Westerville, OH, United States; 4. Petersen Institute of Nano Science and Engineering, Univesity of Pittsburgh, Pittsburgh, PA, United States; 5. Department of Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, United States*

MPA-04. **Underlying mechanism for exchange bias in single molecule magnetic junctions.** *Y. Tang*[1], B. Huang[1] and Y. Chuang[1] *1. Physics, National Central University, Taoyuan, Taiwan*

MPA-05. **Tunable Magnetism and Exchange Bias effect in Multiphase Iron oxide Nanocubes.** *S.B. Attanayake*[1], A. Chanda[1], R. Das[2], M. Phan[1] and H. Srikanth[1] *1. Physics, University of South Florida, Tampa, FL, United States; 2. SEAM Research Centre, South East Technological University, Waterford, Ireland*

MPA-06. **Modifying the Exchange Interactions of (Cu, Ni, and Fe) Doped Co_3O_4 Nanoplates via Ligand Holes.** *M.M. Shepit*[1], J. van Lierop[1] and R. Nickel[1] *1. Physics and Astronomy, University of Manitoba, Winnipeg, MB, Canada*

MPA-07. **Withdrawn**

MPA-08. **Exchange Bias Properties of Cr Doped $Ni_2Mn_{1.4-x}Cr_xGa_{0.6}$ Heusler Alloys.** B.L. Reese[1], *K.M. Stillwell*[1], R. Chapai[1] and M. Khan[1] *1. Physics, Miami University, Oxford, OH, United States*

MPA-09. **Coexistence of Negative Magnetization and Sign Reversal of both Spontaneous and Conventional Exchange Bias in Double Perovskite Y_2FeCrO_6 Nanoparticles.** *K. Patra*[1] and S. Ravi[1] *1. Department of Physics, Indian Institute of Technology Guwahati, Guwahati, India*

MPA-10. **Exchange bias effects in Co/CoO coupled with molecular layers.** *L. Gnoli*[1], M. Benini[1], A. Riminucci[1], M. Singh[1], R.K. Rakshit[1], V. Dediu[1] and I. Bergenti[1] *1. CNR-ISMN, Bologna, Italy*

MPA-11. **Magnetization Switching of Single 120 nm Diameter Synthetic Antiferromagnetic Nanoplatelets with Perpendicular Magnetic Anisotropy.** *J. Li*[1], S. Adhikari[2], Y. Wang[2], L. Ruijs[1], P. Spaeth[2], B. Koopmans[1], M. Orrit[2] and R. Lavrijsen[1] *1. Applied Physics, Eindhoven University of Technology, Eindhoven, Netherlands; 2. Huygens-Kamerlingh Onnes Laboratory, Leiden University, Leiden, Netherlands*

MPA-12. **Magnetic nanowires rotation in suspension under the influence of magnetic field.** *R. Kolisnyk*[1], A. Harpel[1], P. Liu[1], Y. Chen[1] and B. Stadler[1] *1. University of Minnesota Twin Cities, Minneapolis, MN, United States*

MPA-13. **Influence of fiber structure on thermoelectric effect of magnetic electrospinning nanofibers.** *H. Huang*[1] *1. National Applied Research Laboratories, Hsinchu, Taiwan*

MPA-14. **Magnetic vortex mobility for hollow Fe_3O_4 submicron particles studied by a hysteresis scaling technique.** *S. Kobayashi*[1], T. Kiseleva[2], D. Sangaa[3], N. Jargalan[3] and E. Uyanga[3] *1. Iwate University, Morioka, Japan; 2. Moscow M.V. Lomonosov State University, Moscow, Russian Federation; 3. Mongolian Academy of Sciences, Ulaanbaatar, Mongolia*

MPA-15. **Withdrawn**

ORAL SESSIONS

Session NOA

MAGNETO-ELASTIC AND -OPTICAL PHENOMENA

Michelle Jamer, Chair
United States Naval Academy, Annapolis, MD, United States

NOA-01. **NiMn-based Heusler thin films: an amazing class of ferromagnetic shape memory alloys.** ***(Invited)*** *F. Albertini*[1], M. Takhsha Ghahfarokhi[1], F. Casoli[1], L. Nasi[1], S. Fabbrici[1], R. Cabassi[1], J. Arregi[3], V. Uhlir[3], F. Maccari[2], S. Ener[2], O. Gutfleisch[2], P. Tiberto[4], F. Celegato[4] and G. Barrera[4] *1. IMEM-CNR, Parma, Italy; 2. Technical University of Darmstadt, Darmstadt, Germany; 3. CEITEC BUT -Brno University of Technology, Brno, Czechia; 4. INRIM, Torino, Italy*

NOA-02. **Additive manufacturing of Ni-Mn-Sn Heusler alloy - From powder to bulk.** *F. Scheibel*[1], C. Lauhoff[2], P. Krooß[2], S. Riegg[1], L. Schäfer[1], K. Opelt[1,3], D. Koch[1], H. Gutte[4], N. Sommer[5], S. Böhm[5], T. Niendorf[2] and O. Gutfleisch[1] *1. Institute of Materials Sience, Technical University of Darmstadt, Darmstadt, Germany; 2. Institute of Materials Engineering, University of Kassel, Kassel, Germany; 3. Material Cycles and Resource Strategies IWKS, Fraunhofer, Hanau, Germany; 4. Institute for Iron and Steel Technology, TU Bergakademie Freiberg, Freiberg, Germany; 5. Institute for Production Technologies and Logistics, University of Kassel, Kassel, Germany*

NOA-03. **Magnetoelectric coupling and switching in nanoscale devices.** *C. Adelmann*[1], A. Guerenneur[1,2], F. Luciano[1,2], P. Van Dorpe[1,2], S. De Gendt[1,2] and F. Ciubotaru[1] *1. Imec, Leuven, Belgium; 2. KU Leuven, Leuven, Belgium*

NOA-04. **Power transfer in magnetoelectric resonators.** F. Vanderveken[1,2], B. Soree[1,2], F. Ciubotaru[1] and *C. Adelmann*[1] *1. Imec, Leuven, Belgium; 2. KULeuven, Leuven, Belgium*

NOA-05. **Relationship between bias magnetic field and output voltage in magnetostrictive vibration power generator.** *E. Ishikawa*[1], M. Ohtake[1], T. Kawai[1] and M. Futamoto[1] *1. Faculty of Engineering, Yokohama National University, Kanagawa, Yokohama, Japan*

NOA-06. **Heterogeneously Integrated Magneto-Acoustic Resonators.** V.J. Gokhale[1], B.P. Downey[1], S. Mack[1], D.S. Katzer[1], J.A. Roussos[1], D.J. Meyer[1], A. Jander[2] and *P. Dhagat*[2] *1. US Naval Research Laboratory, Washington, DC, United States; 2. School of Electrical Engineering and Computer Science, Oregon State University, Corvallis, OR, United States*

NOA-07. **Nonlinear adaptive wave mixing and Bose-Einstein condensation in magnetoacoustic iron borate.** *D.A. Bas*[1,2], V. Safonov[1], D. Berman[3], Y.V. Rostovtsev[4], J.A. Roberts[4], M.E. McConney[1] and M. Page[1] *1. Materials and Manufacturing, AFRL, WPAFB, OH, United States; 2. Azimuth Corp., WPAFB, OH, United States; 3. Department of Materials Science and Engineering, University of North Texas, Denton, TX, United States; 4. Department of Physics, University of North Texas, Denton, TX, United States*

NOA-08. **Soft Magnetic Elastomer Composites Enabling Magnetic Actuation and Field Sensing Based on Fiber-Optic Interferometry.** *Z. Li*[1], S. Warnarathna Jayasuriya[1], F. Iacoviello[1], C. Joanna M[1], P. Prokopovich[2], I. Parkin[1], A. Desjardins[1] and S. Noimark[1] *1. University College London, London, United Kingdom; 2. Cardiff University, London, United Kingdom*

NOA-09. **3D-printed Magnetic Elastomers: Parameters to Achieve Large and Complex Magnetoaction.** *B. Nelson-Cheeseman*[1], J.M. Ennis[1], J. Lu[1], W.M. Howell[1], S.J. Ziemann[1] and T. Höft[2] *1. Mechanical Engineering, University of St. Thomas, Saint Paul, MN, United States; 2. Mathematics, University of St. Thomas, Saint Paul, MN, United States*

NOA-10. **Reprogrammable Liquid-metal/NdFeB/Silicone Composite Magnetic Elastomer.** ***(Invited)*** *R. Zhao*[3,1], H. Dai[1,2], G. Zhou[4,1], H. Yao[5,2] and B. Zhang[6] *1. Quanzhou Institute of Equipment Manufacturing of Haixi Institutes, Chinese Academy of Sciences, Jinjiang, China; 2. Fujian Institute of Research on the Structure of Matter, Chinses Academy of Sciences, Fuzhou, China; 3. Zhongyuan-Petersburg Aviation College, Zhongyuan University of Technology, Zhengzhou, China; 4. Guangdong Technion-Israel Institute of Technology, Guangzhou, China; 5. University of Chinese Academy of Sciences, Beijing, China; 6. School of Energy and Intelligent Engineering, Henan University of Animal Husbandry and Economy, Zhengzhou, China*

NOA-11. **Magnetically Sensitive Electronic Skins for Supervised Folding of Origami Actuators.** *E. Oliveros Mata*[1], P. Makushko[1], M. Ha[2], G. Cañón Bermúdez[1], J. Liu[3], B.A. Evans[4], J.B. Tracy[3] and D. Makarov[1] *1. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany; 2. Gwangju Institute of Science and Technology, Gwangju, The Republic of Korea; 3. North Carolina State University, Raleigh, NC, United States; 4. Elon University, Elon, NC, United States*

NOA-12. **Magneto-Optical Properties of Cobalt-Glass Nanocomposites.** *G. El Haber*[1,2], F. Goutaland[1], D. Luneau[2], D. Jamon[1], J. Chatelon[1], J. Michalon[1] and F. Royer[1] *1. Univ Lyon, UJM-Saint-Etienne, CNRS, Institute of Optics Graduate School, Laboratoire Hubert Curien UMR CNRS 5516, St-Etienne, France; 2. Laboratoire des Multimatériaux et Interfaces (LMI), Université Claude Bernard Lyon, Villeurbanne Cedex, France*

NOA-13. **Magneto-Optical Figure-of-Merit Dependence on Size and Tb^{3+} Doping of Fe_3O_4 Nanoparticles in Polymer Films.** *T. Ba Tis*[1], J. Bartos[2], M. Nie[2], S. Huang[2] and W. Park[2,1] *1. Materials Science & Engineering program, University of Colorado Boulder, Boulder, CO, United States; 2. Department of Electrical, Computer & Energy Engineering, University of Colorado Boulder, Boulder, CO, United States*

Session NOB
MAGNETOCALORIC MATERIALS I
Brittany Nelson-Cheeseman, Chair
University of St. Thomas, Saint Paul, MN, United States

NOB-01. **Fabrication and characterisation of compositionally graded $La(Fe,Si)_{13}$ films.** E. Fontana[1], T. Devillers[1] and *N. Dempsey*[1] *1. Inistitut NEEL CNRS, Grenoble, France*

NOB-02. **Machine learning assisted optimization towards high-performance $La(Fe,Si)_{13}$-based magnetocaloric materials.** *A. Srinithi*[1,2], A. Bolyachkin[2], X. Tang[2], S. Dieb[2], H. Sepehri-Amin[1,2] and K. Hono[1,2] *1. University of Tsukuba, Tsukuba, Japan; 2. National Institute for Materials Science, Tsukuba, Japan*

NOB-03. **Tailoring mechanical properties and magnetocaloric effect in $LaFe_{11.8}Si_{1.2-z}X_zH_y$ (X = Al, Ga, In).** *A. Pathak*[1], Y. Mudryk[2], O. Dolotko[2] and V. Pecharsky[2,3] *1. Department of Physics, State University of New York (SUNY), Buffalo State, Buffalo, NY, United States; 2. The Ames Laboratory, U. S. Department of Energy, Iowa State University, Ames, IA, United States; 3. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

NOB-04. **Synthesis and magnetic properties of $LaFe_{13-x-y}M_xSi_yN_3$ nitrides.** A. Thayer[1], I. Hlova[1], *Y. Mudryk*[1], X. Liu[1] and V. Pecharsky[1,2] *1. Ames Laboratory of US DOE, Iowa State University, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

NOB-05. **Impact of F and S doping on $(Mn,Fe)_2(P,Si)$ giant magnetocaloric materials.** *F. Zhang*[1], I. Batashev[1], Q. Shen[1], Z. Wu[1], R. Smith[2], G. de Wijs[3], N. van Dijk[1] and E. Brück[1] *1. TUDelft, Delft, Netherlands; 2. The ISIS Facility, Didcot, United Kingdom; 3. Radboud University, Nijmegen, Netherlands*

NOB-06. **Study of the magnetostructural transition in critical-element free $Mn_{1-x}Ni_{1-x}Fe_{2x}Si_{0.95}Al_{0.05}$.** *B. Eggert*[1], K. Wang[2], S. Jafarzadeh[2], C.R. Bahl[2], B.C. Hauback[1] and C. Frommen[1] *1. Hydrogen technology, Institute for Energy Technology, Kjeller, Norway; 2. DTU Energy, DTU, Copenhagen, Denmark*

NOB-07. **The effects of Cu substitution on magnetocaloric effects of the $HoCo_{1-x}Cu_xSi$ ($0 \le x \le 0.4$) phases.** B. Liu[1], G. Zeng[1], *J. Chen*[2] and W. Cui[1] *1. Northeastern University, Shenyang, China; 2. Aerospace Information Research Institute, CAS, Beijing, China*

NOB-08. **Magnetocaloric effect in melt-spun $Ni_{45}Co_5Mn_{36.7}In_{13.3-x}Ge_x$ (x=0 and 3) ribbons.** *M. Norouzi-Inallu*[1,2], A. Ghotbi Varzaneh[2], P. Kameli[2], D. Salazar[3], K. Ullakko[1] and V. Chernenko[3,4] *1. Material Physics Laboratory, Lappeenranta-Lahti University of Technology LUT, Lappeenranta, Finland; 2. Department of Physics, Isfahan University of Technology, Isfahan, The Islamic Republic of Iran; 3. Basque Center for Materials, Applications and Nanostructures and University of Basque Country, Leioa, Spain; 4. Ikerbasque, Basque Foundation for Science, Bilbao, Spain*

NOB-09. **Magnetocaloric effect close to room temperature in R_6TX_2 intermetallics (R = Gd, Tb, Dy; T = Fe, Mn, Co, Ni; X=Sb, Te).** A. Oleaga[1], A. Herrero[1], *I.R. Aseguinolaza*[1], A.V. Garshev[2], V.O. Yapaskurt[3] and A.V. Morozkin[2] *1. Applied Physics, University of the Basque Country, Bilbao, Spain; 2. Chemistry Department, Moscow State University, Moscow, Russian Federation; 3. Faculty of Geology, Moscow State University, Moscow, Russian Federation*

NOB-10. **Chemically controllable magnetic transition temperature and magneto-caloric properties in MnZnSb based compounds.** *J. Alaria*[1] *1. Department of Physics & Stephenson Institute for Renewable Energy, University of Liverpool, Liverpool, United Kingdom*

NOB-11. **Tailoring thermal hysteresis and microstructure of Ni-Mn-based Heusler alloys for multicaloric cooling applications.** *A. Taubel*[1], F. Scheibel[1], L. Pfeuffer[1], N. Shayanfar[1], B. Beckmann[1], T. Gottschall[2], K.P. Skokov[1] and O. Gutfleisch[1] *1. Materials Science, Technical University Darmstadt, Darmstadt, Germany; 2. Dresden High Magnetic Field Laboratory (HLD-EMFL), Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany*

NOB-12. **Tuning in the vast high-entropy alloy space for competitive magnetocaloric properties.** *J. Law*[1], Á. Díaz-García[1], L.M. Moreno-Ramírez[1] and V. Franco[1] *1. Dept. Condensed Matter Physics, University of Seville, Seville, Spain*

Session NOC
MAGNETOCALORIC MATERIALS II
Nora Dempsey, Chair
Insttitut NEEL CNRS, Grenoble, France

NOC-01. **Direct measurement of multicaloric effects under magnetic fields and uniaxial stress in FeRh.** L. Pfeuffer[1], N. Shayanfar[1], T. Gottschall[2], *F. Scheibel*[1], A. Taubel[1], A. Aubert[1], K.P. Skokov[1] and O. Gutfleisch[1] *1. Technical University of Darmstadt, Darmstadt, Germany; 2. Dresden High Magnetic Field Laboratory, Dresden, Germany*

NOC-02. **Heat Capacity and Giant Magnetocaloric Effect of a MnFe(P,Si,B) Compound investigated by semi-adiabatic and Peltier Cell Calorimetry Techniques.** *H. Yibole*[1], J. Xu[1], S. Suye[1], B. Narsu[1], F. Guillou[1], R. Hamane[2] and V. Hardy[2] *1. Inner Mongolia Normal University, Hohhot, China; 2. Normandie University, ENSICAEN, UNICAEN, CNRS, CRISMAT, Caen, France*

NOC-03. **Influence of Metamagnetic transition on Magnetocaloric and Magnetoresistance properties of $Tb_2Co_3Ge_5$.** *U. Remya*[1], A. Kumar[1], S. Sakthivel[1], A. Dzubinska[2], M. Reiffers[3,4] and R. Nagalakshmi[1] *1. Physics, National Institute of Technology, Trichy, Trichy, India; 2. CPM-TIP, University Pavol Jozef Safarik, Kosice, Slovakia; 3. Faculty of Humanities and Natural Sciences, Presov University, Presov, Slovakia; 4. Institute of Experimental Physics, SAS, Kosice, Slovakia*

NOC-04. **Enhancing the hysteresis of phase transformation in $Fe_{48}Mn_{24}Ga_{28}$ Heusler alloy via asymmetric thermomagnetic coupling.** *W. Li*[1], Y. Zhang[2], L. Song[1], D. Huang[1], X. Xi[1], W. Wang[3], G. Wu[1] and Y. Lau[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China; 2. School of Civil Engineering, Guangzhou University, Guangzhou, China; 3. Tiangong University, Tianjin, China*

NOC-05. **Preparation and magnetic properties of Co_2-based Heusler alloy glass-coated microwires with high Curie temperature.** M. Salaheldeen[1,2], V. Zhukova[1], A. Garcia-Gomez[1], P. Corte-Leon[1], M. Ipatov[1] and *A. Zhukov*[1,3] *1. Dept. Polymers and Advanced Mater., Dept. Appl. Phys. and EHU Quantum Center, Univ. of Basque Country, UPV/EHU, San Sebastian, Spain; 2. Physics Department, Faculty of Science, Sohag University, Sohag, Egypt; 3. IKERBASQUE, Basque Foundation for Science, Bilbao, Spain*

NOC-06. **Magnetic ordering in Eu_2In, a compound exhibiting a non-hysteretic giant magnetocaloric effect.** D. Ryan[3], Y. Mudryk[1], A. Pathak[2], P. Manfrinetti[4], C. Ritter[5], D. Paudyal[1], V. Pecharsky[1] and *A. Provino*[4] *1. Ameslab, Ames, IA, United States; 2. Physics, Buffalo State, Buffalo, NY, United States; 3. Physics, McGill University, Montreal, QC, Canada; 4. Chemistry, University of Genova, Genova, Italy; 5. ILL, Grenoble, France*

NOC-07. **Strong spin-orbital coupling-induced unusual magnetic and magnetocaloric features in $YbVO_3$ single crystals.** *M. Balli*[2,3], S. Mansouri[1], S. Ait Jmal[2], P. Fournier[3] and S. Jandl[3] *1. Centre Énergie, Matériaux et Télécommunications, Institut National de la Recherche Scientifique, Varennes, QC, Canada; 2. AMEEC Team, LERMA, International University of Rabat, Rabat, Morocco; 3. Institut Quantique, Université de Sherbrooke, Sherbrooke, QC, Canada*

NOC-08. **Temperature First Order Reversal Curves (TFORC) measurement optimization and thermal loop reconstruction.** Á. Díaz-García[1], *L.M. Moreno-Ramírez*[1] and V. Franco[1] *1. Condensed Matter Physics, University of Seville, Seville, Spain*

NOC-09. **Rotating Magnetocaloric Effect in Low Dimensional Molecular Compounds.** *P. Konieczny*[1], D. Czernia[1] and R. Pelka[1] *1. The Henryk Niewodniczanski Institute of Nuclear Physics Polish Academy of Sciences, Krakow, Poland*

NOC-10. **Influence of Powder Feedstock Characteristics and Process Parameters on Extrusion-based 3D Printing of Magnetocaloric Structures.** *V. Sharma*[1], M. Dey[2], S. Gupta[2], R.L. Hadimani[1,3], H. Zhao[1] and R. Barua[1] *1. Mechanical and Nuclear University, Virginia Commonwealth University, Richmond, VA, United States; 2. Department of Mechanical Engineering, University of North Dakota, Grand Forks, ND, United States; 3. Department of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States*

NOC-11. **Magnetic and Magnetocaloric Properties of Iron Nanoparticles Embedded Titanium Nitride Thin Film Matrix.** *K. Sarkar*[1], M. Roy[1], J. Som[1] and D. Kumar[1] *1. Mechanical Engineering, North Carolina A&T State University, Greensboro, NC, United States*

NOC-12. **Magnetic phase transitions and magnetocaloric effect in $DyCrTiO_5$ nanoparticles.** *B. Bharati*[1,2], P. Mohanty[2], A.R. Prinsloo[2] and C.J. Sheppard[2] *1. Spectrum Analytical Facility, Faculty of Science, UNIVERSITY OF JOHANNESBURG, Johannesburg, South Africa; 2. Department of Physics, UNIVERSITY OF JOHANNESBURG, Johannesburg, South Africa*

NOC-13. **AC and DC Magnetic Softness Enhanced Dual-doped γ-Fe_2O_3 Nanoparticles for Highly Efficient Cancer Theranostics.** *J. Wang*[1], J. Kim[1], K.W. Kang[2], S.H. Paek[2], Y. Takemura[3] and S. Bae[1] *1. Electrical Engineering, University of South Carolina, Columbia, NC, United States; 2. Seoul National University College of Medicine, Seoul, The Democratic People's Republic of Korea; 3. Yokohama National University, Yokohama, Japan*

Session NPA
MAGNETO-ELASTIC, -OPTICAL AND OTHER PHENOMENA (Poster Session)

Radhika Barua, Chair
Virginia Commonwealth University, Richmond, VA, United States

NPA-01. **Magnetoactive Properties of 3D Printed Magnetic Elastomer Structures: Effects of Infill Orientation and Infill Percentage.** *J.M. Ennis*[1], H.G. Thatcher[1], T.M. Calascione[2,1], J. Lu[1], N.A. Fischer[1], S.J. Ziemann[1], T. Höft[1] and B. Nelson-Cheeseman[1] *1. The University of St. Thomas, St. Paul, MN, United States; 2. The University of Colorado Boulder, Boulder, CO, United States*

NPA-02. **Complex Magnetoactuation of 3D-Printed Hard Magnetic Elastomers: Effects of Infill Orientation and Percentage.** *W.M. Howell*[1], J.M. Ennis[1], D.P. Fagan[1], J. Schewe[1], T. Höft[2] and B. Nelson-Cheeseman[1] *1. Mechanical Engineering, University of St. Thomas, St. Paul, MN, United States; 2. Mathematics, University of St. Thomas, St. Paul, MN, United States*

NPA-03. **Impact of 3D Printing Extrusion on Magnetically Annealed High Performance Hard/Soft Magnetic Elastomers.** *J. Lu*[1], N.A. Fischer[1], S.J. Ziemann[1], J.M. Ennis[1], T. Höft[2] and B. Nelson-Cheeseman[1] *1. Mechanical Engineering, University of St. Thomas, St. Paul, MN, United States; 2. Mathematics, University of St. Thomas, St. Paul, MN, United States*

NPA-04. **Multifunctional bipolar resistive switching characteristics in AlN/FSMA/SS based ME heterostructure for flexible ReRAM application.** *P. Kumar*[1] and D. Kaur[1] *1. Physics, Indian Institute of Technology, Roorkee, Roorkee, India*

NPA-05. **Phase transition, electrical transport and magnetic entropy change of $LaFe_{2-y}Co_ySi$ alloys prepared by suction casting.** *N. Kramer*[1], C. Kubiak[1], J.F. Casey[1], C. Hanley[1] and A. Pathak[1] *1. Department of Physics, State University of New York (SUNY), Buffalo State, Buffalo, NY, United States*

NPA-06. **Directional growth effect on magneto-mechanical properties of $Fe_{81}Al_{19}$ alloy.** H.W. Chang[2], S. Jen[1], Y. Liao[2], *Y. Wong*[2], C. Chiu[3] and W. Chang[2] *1. Institute of Physics, Academia Sinica, Taipei, Taiwan; 2. Department of Physics, National Chung Cheng University, Chia-Yi, Taiwan; 3. New Materials Research & Development Dept., China Steel Corp, Kaohsiung, Taiwan*

NPA-07. **Growth of iron/tungsten disulfide heterostructure films with controlled interface and magnetic properties.** *N.W. Mudiyanselage*[1], D. Detellem[1], V. Ortiz Jimenez[1], S. Abdallah[1], A. Hornsey[1], Y.T. Pham[1], N. Alzahrani[1,2], D. Arena[1], H. Srikanth[1], S. Witanachchi[1] and M. Phan[1] *1. University of South Florida, Tampa, FL, United States; 2. University of Jeddah, Jeddah, Saudi Arabia*

NPA-08. **Influences of Thickness to Magnetooptical Effect of Polycrystalline Cerium Substituted Yttrium Iron Garnet Film Prepared by Ion Beam Sputtering.** *Y. Yoshihara*[1,2], P. Lim[2], C.A. Ross[3], K. Ishiyama[1], M. Inoue[1] and T. Goto[1] *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan; 2. Toyohashi University of Technology, Toyohashi, Japan; 3. Massachusetts Institute of Technology, Cambridge, MA, United States*

NPA-09. **The effect of substitution on the structural and magnetic properties of Fe_3Ga_4.** *S. Harrington*[1], O. Bishop[2,3], V. Sharma[2], D. Heiman[4,5], B. Wilfong[1], R. Barua[2] and M.E. Jamer[1] *1. Physics, United States Naval Academy, Annapolis, MD, United States; 2. Mechanical & Nuclear Engineering Department, Virginia Commonwealth University, Richmond, VA, United States; 3. Commonwealth Center for Advanced Manufacturing, Petersburg, VA, United States; 4. Physics, Northeastern University, Boston, MA, United States; 5. Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA, United States*

NPA-10. **Ferromagnetic resonance in magnetoelastic NiFeCu/FeCoSiB bilayers near spin reorientation transition.** *M. Huang*[1], W. Hu[1], Y. Liu[1] and F. Bai[1] *1. University of Electronic Science and Technology of China, Chengdu, China*

POSTER SESSIONS

Session NPB
MAGNETOCALORIC MATERIALS III (Poster Session)

Arjun Pathak, Chair
State University of New York, Buffalo State, Buffalo, NY, United States

NPB-01. **The change of atomic environments caused by Co doping in $La(Fe_{1-x}Co_x)_{11.4}Si_{1.6}$ magnetocaloric materials.** *B. Wang*[1], H. Zhou[1], F. Hu[1] and B. Shen[1] *1. Institute of Physics, Chinese Academy of Sciences, Beijing, China*

NPB-02. **The effect of acid treatment on the magnetic and magnetocaloric properties of Al-rich $Al_{0.85+x}Si_{0.15}Fe_2B_2$.** *K.M. Stillwell*[1], B. Birch[1], N. Kramer[3], B. Reese[1], A. Pathak[2] and M. Khan[1] *1. Physics, Miami University, Oxford, OH, United States; 2. Ames National Laboratory, Ames, IA, United States; 3. SUNY Buffalo State College, Buffalo, NY, United States*

NPB-03. **Magnetocaloric properties of Co-doped $Mn_{0.5}Fe_{0.5}Ni_{1-x}Co_xSi_{0.94}Al_{0.06}$ intermetallic alloys.** *S. Bhattacharjee*[1], N. Kramer[2], M. Khan[1] and A. Pathak[2] *1. Physics, Miami University, Oxford, OH, United States; 2. Physics, State University of New York, Buffalo, NY, United States*

NPB-04. **Magnetostructural transition and magnetocaloric effect in thermally annealed $Mn_{0.5}Fe_{0.5}NiSi_{1-x}Al_x$ melt-spun ribbons (x= 0.055 and 0.060).** *M.d. Arreguin Hernandez*[2,1], A. Dzubinska[2], M. Reiffers[3], J. Sanchez[1,4], C.F. Sanchez Valdés[5] and R. Varga[2] *1. Materiales, Instituto Potosino de Investigacion Cientifica y Tecnologica, San Luis Potosi, Mexico; 2. CPM-TIP, UPJS, Kosice, Slovakia; 3. Faculty of Humanities and Natural Sciences, University of Presov, Presov, Slovakia; 4. Departamento de Fisica, Universidad de Oviedo, Oviedo, Spain; 5. Div. Multidisciplinaria, UACJ, Ciudad Juarez, Mexico*

NPB-05. **Magnetocaloric properties and exchange bias in arc melted Mn_5Sn_3 alloy.** *L. Bachhraj*[1], P. Babu[2] and G. Basheed[1] *1. CSIR-National Physical Laboratory, New Delhi, India; 2. UGC-DAE Consortium for Scientific Research, Mumbai Centre, BARC Campus, Mumbai, India*

NPB-06. **Large reversible magnetocaloric effects in $Pr_{2-x}Nd_xIn$.** *A. Biswas*[1], R.K. Chouhan[1], A. Thayer[1,2], Y. Mudryk[1], O. Dolotko[1] and V. Pecharsky[1,2] *1. Ames National Laboratory, Ames, IA, United States; 2. Department of Materials Science and Engineering, Iowa State University, Ames, IA, United States*

NPB-07. **Effect of X-Ray Irradiation on Magnetocaloric Material, $(MnNiSi)_{1-x}Fe_2Ge_x$.** *J.J. Nunez*[1], V. Sharma[1], J. Rojas[1], R. Barua[1] and R.L. Hadimani[1,2] *1. Mechanical & Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Psychiatry, Harvard University, Boston, MA, United States*

NPB-08. **Near-room temperature magnetocaloric effect in $Mn_{4.9}Cu_{0.1}Ge_3$ compound.** *S. Sakthivel*[1], A. Kumar[1], U. Remya[1], S. Athul[1], A. Dzubinska[2], M. Reiffers[3] and R. Nagalakshmi[1] *1. Intermetallics and NLO Laboratory, Physics, National Institute of Technology Tiruchirappalli, Tiruchirappalli, India; 2. Center for Progressive Materials-Technology and Innovation Park, University Pavol Jozef Šafárik, Kosice, Slovakia; 3. Faculty of Humanities and Natural Sciences, Presov University, Presov, Slovakia*

NPB-09. **Structural, magnetic and magnetocaloric characterization of Ni_2MnSn microwires prepared by Taylor-Ulitovsky technique.** *M.d. Arreguin Hernandez*[1,2], M. Varga[1,3], M. Hennel[1,3], T. Ryba[4], J. Sanchez[2,5] and R. Varga[3,4] *1. Inst. Phys., Fac. Sci., UPJS, Kosice, Slovakia; 2. Materiales, IPICYT, San Luis Potosí, Mexico; 3. CPM-TIP, UPJS, Kosice, Slovakia; 4. RVmagnetic, Kosice, Slovakia; 5. Departamento de Fisica, Universidad de Oviedo, Oviedo, Spain*

NPB-10. **Investigation Of Structural And Magnetic Properties Of Nanocrystalline $Pr_{0.57}Bi_{0.1}Ca_{0.33}MnO_3$.** *G. Singh*[1], A. Gaur[1] and R.N. Mahato[1] *1. School Of Physical Sciences, JNU, New Delhi, India*

NPB-11. **Withdrawn**

NPB-12. **Magnetocaloric properties in $Pr_{1-x}Sr_xMnO_3$(x=0.48 and 0.52): Study using Landau and Maxwell Model.**
A.K. Saw[1], J.J. 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

NPB-13. **"Study of magnetotransport and Magnetocaloric properties of Calcium (Ca) doped $La_{0.97-x}Ca_xHo_{0.03}MnO_3$ composite system".** *M. Azim*[1], J. Mohapatra[2] and S. Mishra[1]
1. Physics and Material Science, University of Memphis, Memphis, TN, United States; 2. Physics, University of Texas, Arlington, Arlington, TX, United States

NPB-14. **Concentration-dependent Oscillation of Specific Loss Power in Magnetic Nanofluid Hyperthermia.** *J. Wang*[1], J. Kim[1], H. Kim[1] and S. Bae[1] *1. Electrical Engineering, University of South Carolina, Columbia, SC, United States*

NPB-15. **Heatrapy 2.0: a two-dimensional upgrade for computing dynamic heat transfer processes in Python involving non conventional phenomena.** *D. Silva*[1] *1. IFIMUP – Institute of Physics for Advanced Materials, Nanotechnology and Photonics, Faculty of Science of the Porto University, Porto, Portugal*

Session OOA
MAGNETIC SENSORS AND DEVICES I

Nicoleta Lupu, Co-Chair
National Institute of R&D for Technical Physics, Iasi, Romania
Carmine Clemente, Co-Chair
University of Sannio, Benevento, Italy

OOA-01. **Non-Reciprocity and Non-linearity in Engineered Magneto-Acoustic Devices.** ***(Invited)*** D.A. Bas[1], R. Verba[2], P. Shah[1], S. Leontsev[1], A. Matyushov[3], M. Newburger[1], N. Sun[3], V. Tyberkevych[4], A.N. Slavin[4] and *M. Page*[1] *1. Air Force Research Laboratory, WPAFB, OH, United States; 2. Institute of Magnetism, Kyiv, Ukraine; 3. Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, United States; 4. Department of Physics, Oakland University, Rochester, MI, United States*

OOA-02. **Low Power High Precision MI Sensor Driven by Low-Frequency Wiegand Pulse.** *R. Yao*[1,2], Y. Takemura[2] and T. Uchiyama[1] *1. Graduate School of Engineering, Nagoya University, Nagoya, Japan; 2. Division of Electrical and Computer Engineering, Yokohama National University, Yokohama, Japan*

OOA-03. **Monolithic 3D (IP_OoP) MTJ sensor for low footprint and compact size sensor applications.** *M. Kandzija*[2,1], P. Freitas[2,1], R. Macedo[2], S. Cardoso[2,1] and M. Erkovan[2,1]
1. Instituto Superior Técnico, Lisbon, Portugal; 2. INESC MN, Lisbon, Portugal

OOA-04. **Evaluation of Coplanar Line Type Thin Film Magnetic Field Sensor with Narrow Slits.** *M. Sakamoto*[1], R. Suzuki[1], T. Ishihara[1], J. Honda[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan*

OOA-05. **Grain Structure Influence on Synchronized Two-Dimensional Spin-Hall Nano-Oscillator.** *C.C. Capriata*[1] and B.G. Malm[1] *1. Division of Electronics and Embedded Systems, KTH Royal Institute of Technology, Stockholm, Sweden*

OOA-06. **Investigation of signal and noise in symmetric response GMR under AC modulation.** *Y. Higashi*[1], A. Kikitsu[1], Y. Kurosaki[1] and S. Shirotori[1] *1. Toshiba Corporation, Kawasaki, Japan*

OOA-07. **Sensitivity Distribution Function of an AC Field Modulation GMR Sensor with Magnetic Field Concentrators.** *A. Kikitsu*[1], Y. Higashi[1], Y. Kurosaki[1], S. Shirotori[1], T. Nagatsuka[2], K. Suzuki[2] and Y. Terui[2] *1. Toshiba Corp., Kawasaki, Japan; 2. Toshiba Nanoanalysis Corp., Yokohama, Japan*

OOA-08. **Offset-free magnetic sensing principle and the role of the spin-orbit torque coefficients.** *J.M. Salazar-Mejía*[1], S. Koraltan[1], C. Abert[1], F. Slanovc[1], P. Flauger[1], M. Agrawal[2], A. Satz[3], C. Schmitt[4], G. Jakob[4], M. Kläui[4], H. Brückl[5] and D. Suess[1] *1. Physics of Functional Materials, University of Vienna, Wien, Austria; 2. Infineon Technologies AG, Neubiberg, Germany; 3. Infineon Technologies Austria, Villach, Austria; 4. Institute of Physics, Johannes Gutenberg-University Mainz, Mainz, Germany; 5. Department für Integrierte Sensorsysteme, Universität für Weiterbildung Krems, Wiener Neustadt, Austria*

OOA-09. **Improved Permanent Magnet Geometry to Read Soft Magnetic Barcodes Using Magnetoresistive Sensors.** *S. Abrunhosa*[1,2], I. Gibb[3], R. Macedo[1], E. Williams[3], P. Freitas[1,2] and S. Cardoso[1,2] *1. INESC MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 3. MagVision Ltd., Frome, United Kingdom*

OOA-10. **Thin Film Microstrip Line Type Probe with Slits and Permeability Measurement of Thick Magnetic Material.** *S. Yabukami*[1], M. Sakamoto[1], J. Honda[1], Y. Watanabe[1] and K. Okita[1] *1. Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan*

OOA-11. **Development of a Magnetic Sensor Using Co:MgO Antidots.** Y. Ding[1], D.C. Lloyd[1] and *A. Hirohata*[1] *1. University of York, York, United Kingdom*

OOA-12. **Detecting Magnetic Fields with Printed Magnetoresistive Sensors on Rigid and Flexible Substrates.** *E. Oliveros Mata*[1], C. Voigt[2], X. Rui[1], M. Ha[3], G. Cañón Bermúdez[1], T. Kosub[1], I. Moench[1], Y. Zabila[1], R. Illing[1], Y. Wang[1], N. Valdez-Garduño[4], M. Fritsch[2], S. Mosch[2], M. Kusnezoff[2], J. Fassbender[1] and D. Makarov[1] *1. Helmholtz-Zentrum Dresden Rossendorf, Dresden, Germany; 2. Fraunhofer-Institut für Keramische Technologien und Systeme, Dresden, Germany; 3. Gwangju Institute of Science and Technology, Gwangju, The Republic of Korea; 4. Centro de Nanocencias y Nanotecnología, Ensenada, Mexico*

OOA-13. **Optimization of MnIr growth for high temperature magnetic sensor operation.** *P. Araujo*[1,2], R. Macedo[1], S. Cardoso[1,2], D. Leitao[1] and P. Freitas[1,2] *1. Instituto de Engenharia de Sistemas E Computadores – Microsistemas e Nanotecnologias (INESC MN), Lisboa, Portugal; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal*

Session OOB

MAGNETIC SENSORS AND DEVICES II

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

OOB-01. **Surface Acoustic Wave based Resonant Magnetic Field Sensors with Ferromagnetic Layer as the Acoustic Waveguide.** ***(Invited)*** *C. Zhang*[1] and T. Nan[1] *1. School of Integrated Circuits and Beijing National Research Center for Information Science and Technology (BNRist), Tsinghua University, Beijing 100084, China, Beijing, China*

OOB-02. **Integration of hard magnetic layer in MEMS process.** *S. Cuccurullo*[1], G. Pavese[1], A. Plaza[1], O. Koplak[1], F. Maspero[2] and R. Bertacco[1] *1. Physics, Politecnico di Milano, Milano, Italy; 2. DICA, Politecnico di Milano, Milano, Italy*

OOB-03. **Superparamagnetic ferrite film based RF inductors: on-chip integration and enhanced performance.** *S. Arackal*[1], R. Kahmei[1], N. Bhat[1], S.A. Shivashankar[1] and R. Sai[1,2] *1. Centre for Nano Science and Engineering, Indian Institute of Science, Bengaluru, India; 2. Tyndall National Institute, Cork, Ireland*

OOB-04. **Self-resonant frequency of inductors for quantification of magnetic nanoparticles.** *J.L. Marqués*[1], M. Salvador[1], J.C. García-Martínez[1], P. Fernández-Miaja[2], A. García[3] and M. Rivas[1] *1. Physics, Universidad de Oviedo, Oviedo, Spain; 2. Electrical Engineering, Universidad de Oviedo, Gijón, Spain; 3. Electricity and Electronics, UPV, Bilbao, Spain*

OOB-05. **Method for Measuring Magnetic Susceptibility of Magnetic Nanoparticles up to Millimeter-Wave Frequency Range.** *Y. Pu*[1], Y. Watanabe[3], L. Ton That[2], T. Murayama[3], K. Okita[3] and S. Yabukami[1] *1. School of Enginneering, Tohoku University, Sendai, Japan; 2. Graduate School of Enginneering, Tohoku University, Sendai, Japan; 3. Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan*

OOB-06. **Creep-induced Magnetic Anisotropy of Nanocrystalline Wire as a Core of Fluxgate Sensor.** *D. Hrakova*[1] and P. Ripka[1] *1. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia*

OOB-07. **Multiple-wire orthogonal fluxgate with cross-spectrum noise suppression.** *M. Butta*[1], M. Dressler[1] and M. Janosek[1] *1. Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia*

OOB-08. **Skin-conformal magnetoreceptors for human-machine interaction.** *P. Makushko*[1,2], E. Oliveros Mata[1], G. Cañón Bermúdez[1], M. Hassan[3,4], S. Laureti[3], C. Rinaldi[5], F. Fagiani[5], G. Barucca[4], Y. Zabila[1], J. Fassbender[1], I. Vladymyrskyi[2], M. Albrecht[6], G. Varvaro[3], X. Rui[1] and D. Makarov[1] *1. Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf e.V., Dresden, Germany; 2. Paton Institute of material Science and Electric Welding, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine; 3. Istituto di Struttura della Materia, Consiglio Nazionale delle Ricerche, Roma, Italy; 4. Dipartimento SIMAU, Università Politecnica delle Marche, Ancona, Italy; 5. Department of Physics, Politecnico di Milano, Milano, Italy; 6. Institute of Physics, University of Augsburg, Augsburg, Germany*

OOB-09. **Development of an Auto-Oriented Circulator Based on Hexaferrite Materials in the 5G Frequency Band.** *R. Mansour*[1], Z. Riah[1], S. Clevers[2], V. Nachbaur[2], M. Jean[2] and S. Jouen[2] *1. IRSEEM, ESIGELEC, Rouen, France; 2. GPM, Université de Rouen, Rouen, France*

OOB-10. **Ferromagnetic shape memory alloy-based SAW resonator towards magnetic field sensor application.** P. Kumar[1] and *D. Kaur*[1] *1. Physics, Indian Institute of Technology, Roorkee, Roorkee, India*

Session OPA
MAGNETIC SENSORS AND DEVICES III (Poster Session)

Diana Leitao, Chair
Eindhoven University of Technology, Eindhoven, Netherlands

OPA-01. **Electrical compact modelling of GMR devices for neuromorphically inspired sensors.** A. Ghilas[1], C. Reig[1], M. Cubells-Beltran[1], F. Pardo[2], J.A. Boluda[2], F. Vegara[2], S. Abrunhosa[3] and *S. Cardoso*[3] *1. Electronic Engineering, University of Valencia, Burjassot, Spain; 2. Computer Science, University of Valencia, Burjassot, Spain; 3. INESC-MN, Lisbon, Portugal*

OPA-02. **MTJ-based Marine Sensor for Jellyfish Cassiopea Response to the Environmental Change.** *S. Amara*[1], G. Izhar[1], D. Khan[1] and Y. Massoud[1] *1. Computer, Electrical and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

OPA-03. **Magnetic elliptical array biosensor based on ferromagnetic resonance signal.** *H. Huang*[1] *1. National Applied Research Laboratories, Hsinchu, Taiwan*

OPA-04. **Novel Sensing Technique for Non-Destructive Composites Monitoring.** *V. Zhukova*[1], P. Corte-Leon[1], A. Allue[2], K. Gondra[2], M. Ipatov[1], J. Blanco[3], J. Gonzalez[4] and A. Zhukov[1,5] *1. Dept. Polymers and Adv. Mater., Dept. App. Phys. and EHU Quantum Center, University of Basque Country, UPV/EHU, San Sebastian, Spain; 2. Gaiker Technological Centre, Zamudio, Spain; 3. Dept. App. Phys. and EHU Quantum Center, University of Basque Country, UPV/EHU, San Sebastian, Spain; 4. Dept. Polymers and Adv. Mater. and EHU Quantum Center, University of Basque Country, UPV/EHU, San Sebastian, Spain; 5. IKERBASQUE, Basque Foundation for Science, Bilbao, Spain*

OPA-05. **Indirect Observation of Circumferential Domain Magnetization Reversal of Amorphous Wires Using Orthogonal Fluxgate Effect.** *M. Dressler*[1], M. Butta[1] and M. Janosek[1] *1. Department of Measurement, Czech Technical University in Prague - Faculty of Electrical Engineering, Prague, Czechia*

OPA-06. **Spin Hall magnetic field sensors for vehicles using the Wheatstone bridge.** *J. Kwon*[1], S. Noh[1], J. Lee[1], H. Lee[1], S. Jang[2,3], B. Min[2] and D. Han[2] *1. Materials Research and Engineering Center, Hyundai Motor Company, Uiwang-si, The Republic of Korea; 2. Center for Spintronics, Korea Institute of Science and Technology (KIST), Seoul, The Republic of Korea; 3. School of Electrical Engineering, Korea University, Seoul, The Republic of Korea*

OPA-07. **Tailorable force sensor based on stress-magneto-impedance effect in amorphous wires.** S. Corodeanu[1], C. Hlenschi[1], H. Chiriac[1], *N. Lupu*[1] and T.A. Ovari[1] *1. National Institute of Research and Development for Technical Physics, Iasi, Romania*

OPA-08. **Multifunctional Phase Change Composites for Passive Thermal Management and Electromagnetic Shielding of High-Frequency Devices.** *W. Salter*[1], J. Lundquist[1], W. Lohr[2], O. Fitchorova[3,4], V.G. Harris[3,4], E. Topsakal[1], R.L. Hadimani[5] and R. Barua[5] *1. Electrical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. KRI at Northeastern University, LLC, Burlington, MA, United States; 4. Electrical Engineering, Northeastern University, Boston, MA, United States; 5. Mechanical & Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States*

OPA-09. **Periodic THz Absorber Design for Sensor Applications.** *A. Eroglu*[1] and B. Chowdhury[1] *1. ECE, North Carolina A&T State University, Greensboro, NC, United States*

OPA-10. **Magnetic tunnel junctions for positioning systems with down to 100 nm resolution.** *A. Talantsev*[1], E. Paz[1], A. Araujo[1], M. Majeed[2], P. Pedrosa[2] and R. Ferreira[1] *1. Spintronics, Internatinal Iberian Nanotechnology Laboratory, Braga, Portugal; 2. DTX Colab, University of Minho, Guimaraes, Portugal*

OPA-11. **Withdrawn**

OPA-12. **High-performance MTJ-based Sensors for Monitoring of Atmospheric Pollution.** *S. Amara*[1], A. Aljedaibi[1], D. Khan[1] and Y. Massoud[1] *1. Computer, Electrical and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

OPA-13. **On-chip Quantitative Cell sorting based on High Performance Magnetic Tunnel Junction.** *A. Aljedaibi*[1], S. Amara[1] and Y. Massoud[1] *1. CEMSE, KAUST, Thuwal, Saudi Arabia*

OPA-14. **An Integrated and Highly-Sensitive Magnetic Tunnel Junction based Cytometer.** A. Aljedaibi[1], *S. Amara*[1] and Y. Massoud[1] *1. CEMSE, KAUST, Thuwal, Saudi Arabia*

POSTER SESSIONS

Session OPB
MOTORS, ACTUATORS AND RELATED (Poster Session)

Mattia Butta, Chair
Czech Technical University in Prague, Praha, Czechia

OPB-01. **Analysis and Design of Watch Speaker to Enhance Mid-frequency Sound Pressure Level with Magnetic Circuit Size Expansion.** *J. Park*[1], Z. Jiang[1] and S. Hwang[1] *1. Mechanical engineering, Pusan national university, Busan, The Republic of Korea*

OPB-02. **Electromagnetic Alternators with Composite Amorphous Alloy Housing for Improving Characteristics.** *C. Hsu*[1] *1. Mechanical Engineering, Asia Eastern University of Science and Technology, Banqiao District, Taiwan*

OPB-03. **Microwave Absorption Performance of CoTi-doped M-type Hexagonal Ferrite in the Millimeter-wave Spectrum.** *H. Won*[1], Y. Hong[1], M. Choi[1], H. Garcia[2], H. Xin[2], H. Jung[3] and K. Lee[3] *1. Department of Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Department of Electrical and Computer Engineering, The University of Arizona, Tucson, AZ, United States; 3. Semiconductor Materials R&D/ Advanced Materials, LG Chemistry Ltd, Seoul, The Republic of Korea*

OPB-04. **A New Approach to Identify the Motor Vibration and Noise Dependent on Harmonic and FFT Transform.** *C. Hsu*[1] *1. Mechanical Engineering, Asia Eastern University of Science and Technology, New Taipei City, Taiwan*

OPB-05. **Optimal Design of High-Speed Permanent Magnet Synchronous Machine Based on NSGA-II Considering Mechanical Characteristics.** *S. Jo*[1], W. Kim[3], Y. Lee[1], T. Bang[2], H. Lee[1], J. Lee[1] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. Hyundai Mobis R&D Center, Yongin, The Republic of Korea; 3. Hyundai elevator R&D Center, Chungju, The Republic of Korea*

OPB-06. **Prediction of Abnormal Noise and Harmonic of Electromagnetic Motor on Electric Vehicle.** *C. Hsu*[1] *1. Mechanical Engineering, Asia Eastern University of Science and Technology, New Taipei City, Taiwan*

OPB-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. Mechanical engineering, Pusan National University, Busan, The Republic of Korea*

OPB-08. **A Novel Fault-Tolerant Multi-Tooth Field Modulated Machine with Hybrid Excitation.** *Z. Jin*[1], X. Zhu[1], S. Ding[1] and X. Wang[1] *1. Nanjing Normal University, Nanjing, China*

OPB-09. **Comparative Analysis of Three Novel Fault-Tolerant Multi-Tooth Flux-Switching Permanent-Magnet Machine.** *Z. Jin*[1], X. Zhu[1], S. Ding[1] and L. Liu[1] *1. Nanjing Normal University, Nanjing, China*

OPB-10. **Torque Analysis of a Permanent Magnet Synchronous Motor using Flux Densities in Air Gap.** *S. Lee*[1], C. Kim[1], Y. Choo[1], G. Yun[1] and C. Lee[1] *1. Electrical Engineering, Pusan National University, Busan, The Republic of Korea*

OPB-11. **Vibration Analysis of a Permanent Magnet Synchronous Motor by a Pole/Slot Combination.** *G. Yun*[1], Y. Choo[1], C. Kim[1], S. Lee[1], D. Hong[2] and C. Lee[1] *1. Electrical Engineering, Pusan National University, Busan, The Republic of Korea; 2. Electric Motor Research Center, Korea Electrotechnology Research Institute, Changwon, The Republic of Korea*

OPB-12. **Withdrawn**

OPB-13. **Analysis and Measurements of Influence of Current Harmonics on Vibration of High-Speed Motors with Rare-Earth Permanent Magnets.** *J. Woo*[1], H. Lee[1], S. Kim[1], J. Lee[1], K. Kim[2] and J. Choi[1] *1. Electrical Engineering, Chungnam National University, Yuseong-gu, The Republic of Korea; 2. In-wheel system development cell, Hyundai mobis, Giheung, The Republic of Korea*

OPB-14. **The Influence of Structural Parameters and Layout Form of Silicon Sheet on The Spectrum Characteristics of Magnetic Field in Propulsion Motor.** *X. Liang*[1], W. Li[1], J. Gao[1], M. Wang[1] and P. Zheng[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

POSTER SESSIONS

Session PPA

MAGNETICS FOR POWER ELECTRONICS AND CONTROL (Poster Session)

Yongjian Li, Chair

Hebei University of Technology, Tianjin, China

PPA-01. **Development of a Novel Radial - Axial Flux Permanent Magnet Claw Pole Machine with SMC Cores and Ferrite Magnets.** *C. Liu*[1], F. Yang[1] and Y. Wang[1] *1. Hebei University of Technology, Tianjin, China*

PPA-02. **Study on magnetic stability of low corrective force permanent magnet in memory machine under inverter open-circuit fault.** *X. Zhao*[1], H. Lin[1], W. Liu[1] and X. Zeng[1] *1. Southeast University, Nanjing, China*

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

PPA-04. **Characteristic Analysis and Experimental Study for Accurate Prediction of Electromagnetic Losses in High-Speed Permanent Magnet Synchronous Motors.** *K. Shin*[1], J. Lee[1], H. Cho[2], J. Choi[2], S. Lee[3] and M. Koo[3] *1. Power System Engineering, Chonam National University, Yeosu, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea; 3. Korea Institute of Industrial Technology, Gwangju, The Republic of Korea*

PPA-05. **Optimization of Detent Force in Linear Oscillatory Generator with Assisted Permanent Magnet and Stacking Effect for Stirling Engines Using Analytical Method.** *K. Shin*[1], J. Lee[1], H. Cho[2], J. Choi[2], S. Lee[3] and M. Koo[3] *1. Chonnam National University, Yeosu, The Republic of Korea; 2. Chungnam National University, Daejeon, The Republic of Korea; 3. Korea Institute of Industrial Technology, Gwangju, The Republic of Korea*

PPA-06. **Analysis and comparison of permanent magnet synchronous motor according to rotor type under same design specification.** *W. Jung*[1], H. Lee[1], Y. Lee[1] and J. Choi[1] *1. Chunnam National University, Daejeon, The Republic of Korea*

PPA-07. **A Study on the Prediction of Electromagnetic and NVH Characteristics of Permanent Magnet Synchronous Machine according to the different Pole/Slot Combination.** *Y. Lee*[2], T. Bang[1], H. Lee[2], K. Shin[3], J. Choi[2] and S. Jo[2] *1. HYUNDAI MOBIS, Gyeonggi-do, The Republic of Korea; 2. Electrical engineering, Chungnam National university, Daejeon, The Republic of Korea; 3. Power System Engineering, Chonnam National university, Yeosu-si, The Republic of Korea*

PPA-08. **Design and Analysis of a New Field-modulated Permanent Magnet Machine with an Improved PM Rotor.** F. Bian[1], *M. Li*[1], C. Ke[1] and J. Su[1] *1. Zhong Yuan University of Technology, Zhengzhou, China*

PPA-09. **Multi-Objective Optimal design of Surface-mounted permanent magnet synchronous motor using analytical method and Particle swarm optimization algorithm.** *S. Kim*[1], J. Woo[1], W. Kim[2], K. Shin[3] and J. Choi[1] *1. electrical engineering, Chungnam National University, Daejeon, The Republic of Korea; 2. Hyundai Elevator, Chungju, The Republic of Korea; 3. Power System Engineering, Chonnam National University, Yeosu, The Republic of Korea*

PPA-10. **Magnetic field and Torque Analysis of Coaxial Magnetic Gear Using Semi-Analytical Method.** *H. Lee*[1], J. Lee[1], K. Shin[2] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea; 2. Chonnam National University, Yeosu, The Republic of Korea*

PPA-11. **A New Magnetic-Field Modulated Machine with Compound-structure Magnets of Spoke PMs and Halbach PMs.** F. Bian[1], *C. Ke*[1], J. Su[1] and M. Li[1] *1. Zhong Yuan University of Technology, Zhengzhou, China*

PPA-12. **Thermal Analysis and Experimental Verification of Permanent Magnet Synchronous Motor by Combining Lumped-Parameter Thermal Networks with Analytical Method.** *M. Nguyen*[1], H. Lee[1], Y. Lee[1] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea*

PPA-13. **Fault Operation Analysis Of A Novel Dual-Three-Phase Dual-Rotor Flux-Switching Permanent Magnet Machine.** *Z. Chang*[1], G. Zhao[1], Z. Li[1], Y. Zhou[1] and X. Jiang[1] *1. Nanjing Normal University, Nanjing, China*

PPA-14. **Design and analysis of a novel asymmetric-stator-pole hybrid excited flux reversal machine.** H. Yang[1], *H. Huang*[1], Y. Liu[1], H. Lin[1] and Z. Zhu[2] *1. Electrical Engineering, Southeast University, Nanjing, China; 2. The University of Sheffield, Sheffield, United Kingdom*

PPA-15. **A Novel Variable Flux Memory Machine with Weak Saliency Ratio.** *X. Zeng*[1], H. Lin[1] and X. Zhao[1] *1. Southeast University, Nanjing, China*

POSTER SESSIONS

Session PPB
SHIELDING, LEVITATION AND PROPULSION (Poster Session)

Jang-Young Choi, Chair
Chungnam National University, Daejeon, The Republic of Korea

PPB-01. **Three-dimensional Analytical Modeling of Coreless Linear Induction Maglev Motor with Uneven Air Gap Conditions.** *W. Qin*[1] *1. EE, Beijing Jiaotong University, Beijing, China*

PPB-02. **Design and Analysis of Reduced Rare-Earth Magnet Surface Permanent Magnet Motor using Sandwich Magnets.** *A.P. Singh*[1], X. Liu[1] and C.I. Nlebedim[1] *1. Critical Material Institute, Ames Laboratory, AMES, IA, United States*

PPB-03. **Shape Design Optimization of Interior Permanent Magnet Synchronous Machine with Hybrid GO and NGO Silicon Sheet Cores.** *C. Liu*[1], X. Huang[1] and Y. Wang[1] *1. Hebei University of Technology, Tianjin, China*

PPB-04. **Characteristic Analysis of a Permanent Magnet Synchronous Generator Considering Overhang and Bolting Structure Based on Analytical Method.** *J. Hong*[1], H. Lee[1], H. Shin[1], K. Shin[2] and J. Choi[1] *1. Chungnam National University, Daejeon, The Republic of Korea; 2. Chonnam National University, Yeosu, The Republic of Korea*

PPB-05. **Research on Improvement of Torque and Loss Characteristics for an In-Wheel Permanent Magnet Motor Considering Featured-Airgap-Harmonic.** *J. Ren*[1] and Z. Xiang[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-06. **EMI Materials Design for High Shielding Effectiveness using AI (Machine Learning).** *M. Choi*[1], Y. Hong[1], H. Won[1], H. Jung[2] and K. Lee[2] *1. Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL, United States; 2. Semiconductor Materials R&D/Advanced Materials, LG Chemistry, Seoul, The Republic of Korea*

PPB-07. **A Selective Magnetic Field Generation Method for the Manipulation of Two-Dimensional Magnetic Microrobots Using a Triad of Electromagnetic Coils.** *D. Lee*[1], Y. Lee[1] and S. Jeon[1] *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

PPB-08. **Research on High-efficiency Region of Interior Permanent Magnet Synchronous Motor with Variable Magnetic Field Effect.** *X. Yu*[1] and Z. Xiang[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-09. **Design and Analysis of a V-Shaped Leakage-Flux-Controllable PM Machine with Improved Torque Performances.** *X. Cai*[1] and X. Zhu[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-10. **Low Vibration Design of Variable Leakage Flux Permanent Magnet Motor Considering Multiple Working Conditions.** *T. Liu*[1] and L. Quan[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-11. **Airgap-Harmonic-Oriented Partitioned Design Method of PMV Motor with Improved Torque Performances.** *Z. Wu*[1] and D. Fan[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-12. **Multi-Level Robust Optimization Design of Double-Stator Vernier Permanent Magnet Motor.** *C. Yang*[1] and L. Quan[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-13. **Optimization Design and Analysis of an In-Wheel PM Motor Based on Common-Node Magneto-Thermal Bidirectional Coupling Network Model.** *Z. Yang*[1] and X. Zhu[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-14. **Research on Vibration Characteristic of a V-shaped PM In-Wheel Motor Considering Radial Electromagnetic Force Modulation Effect.** *J. Bai*[1] and X. Zhu[1] *1. School of Electrical and Information Engineering, Jiangsu University, Zhenjiang, China*

PPB-15. **A Novel Magnetic Field Calculation Method for Propulsion Motor with Uneven Arrangement of Silicon Sheet.** *X. Liang*[1], M. Wang[1], P. Zheng[1], J. Gao[1] and W. Li[1] *1. School of Electrical Engineering and Automation, Harbin Institute of Technology, Harbin, China*

Session PPC
TRANSFORMERS AND INDUCTORS (Poster Session)

Xiaojun Zhao, Chair
North China Electric Power University, Baoding, China

PPC-01. **Iron loss evaluation method for SiFe sheet material under PWM inverter excitation.** *H. Matsumori*[1], T. Yamaguchi[1], T. Kosaka[1], T. Shimizu[2] and N. Matsui[1] *1. Electrical and Mechanical Engineering, Nagoya Institute of Technology, Nagoya, Japan; 2. Tokyo Metropolitan University, Tokyo, Japan*

PPC-02. **Analysis and Design of Load-Independent Output Current or Output Voltage of Integrated Coil Wireless EV Charging System.** L. Chen[1], *F. Wu*[1], T. Ben[1], C. Zhang[1], L. Jing[1] and Q. Liu[1] *1. Hubei Provincial Research Center on Microgrid Engineering Technology, China Three Gorges University, Yichang, China*

PPC-03. **Design of lower vibration combined with magnetic equivalent circuit.** *T. Ben*[1,2], M. Fang[1], L. Chen[1] and P. Zhang[1] *1. College of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China; 2. State Key Laboratory of Reliability and Intelligence of Electrical Equipment and the Province-Ministry Joint Key Laboratory of EFEAR, Hebei University of Technology, Tianjin, China*

PPC-04. **A Model Order Reduction of Hysteretic Eddy-current Fields in Electric Machines Using Cauer Ladder Network Method.** *M. Tobita*[1] and T. Matsuo[1] *1. Graduate School of Engineering, Kyoto University, Kyoto, Japan*

PPC-05. **Optimal Design of Low Noise Medium-High Frequency Transformer Considering the Influence of Excitation Waveform.** Y. Li[1], *Z. Yang*[1], P. Guo[1] and C. Zhang[1] *1. Hebei University of Technology, Tianjin, China*

PPC-06. **Extremely Low Frequency Multi-Directional Electromagnetic Wave Energy Harvester Based on Special Double Pendulum Structure.** *Y. Li*[1], J. Qiu[1], T. Lan[1] and H. Song[1] *1. Chongqing University, Chongqing, China*

PPC-07. **A Study on Stator Shape to Reduce Cogging Torque and Torque Ripple of Double-Layer Spoke Type PMSM.** D. Nam[1], S. Song[2], N. Jo[1] and *W. Kim*[1] *1. Electrical Engineering, Gachon University, Seong-Nam, The Republic of Korea; 2. Electrical Engineering, Hanyang University, Seong-Nam, The Republic of Korea*

PPC-08. **Study on Vibration and Noise Reduction of Anodic Saturable Reactor.** C. Zhang[1], *T. Chen*[1], Y. Li[1], Q. Yang[1], Y. Dou[1] and S. Song[1] *1. School of Electrical Engineering, Hebei University of Technology, Tianjin, China*

PPC-09. **Analysis of flux barrier effect of LCF PM in series hybrid magnet variable flux memory machine.** H. Yang[1], *Y. Huang*[1], H. Zheng[1], H. Lin[1] and Z. Zhu[2] *1. Southeast University, Nanjing, China; 2. The University of Sheffield, Sheffield, United Kingdom*

PPC-10. **Withdrawn**

PPC-11. **Inter-Turn Fault Early Diagnosis of Dual Three-Phase PM Machine Using Multi-Orthogonal Spaces.** *Z. Yuan*[1], W. Liu[1], Y. Sui[1], M. Wang[1] and P. Zheng[1] *1. Harbin Institute of Technology, Harbin, China*

PPC-12. **Study on the characteristics of power transmission side of leaky magnetic field canceling coil for contactless power transfer while running.** *M. Yokosawa*[1], H. Kojima[1], F. Sato[1], S. Miyahara[1], H. Matsuki[2], K. Iada[3] and S. Sasaki[4] *1. Tohoku-gakuin University, Tagajo, Japan; 2. Tohoku University, Sendai, Japan; 3. NITTOKUCo. Ltd., Fukushima, Japan; 4. HikaridenshiCo. Ltd., Osaki, Japan*

PPC-13. **The Influence of Electromagnetic Noise of Volume Magnetostriction Anisotropy on Power Transformers.** *C. Hsu*[1] *1. Mechanical Engineering, Asia Eastern University of Science and Technology, New Taipei City, Taiwan*

ORAL SESSIONS

Session QOA
BIOMEDICAL APPLICATION OF MAGNETIC NANOPARTICLES

Frank Abel, Chair

National Institute of Standards and Technology, Gaithersburg, MD, United States

QOA-01. **Exceptionally Large Magnetism in Gd Implanted MoS_2 Due to Both Radiation Damage and Gd^{3+} Ions.** M. Zhang[1], W. Cheng[1], M. Ying[1] and *G.A. Gehring*[2] *1. Key Laboratory of Beam Technology of Ministry of Education, College of Nuclear Science and Technology, Key Laboratory of Beam Technology of Ministry of Education, College of Nuclear Science and Technology, Beijing Normal University, Beijing 100875, China; 2. Physics and Astronomy, University of Sheffield, Sheffield, United Kingdom*

QOA-02. **Effect of the distribution of anisotropy constants on the magnetic properties of iron oxide nanoparticles.** D.M. Clarke[1], C. Marquina[2,3], D.C. Lloyd[4] and *G. Vallejo-Fernandez*[1] *1. Physics, University of York, York, United Kingdom; 2. Fisica de la Materia Condensada, Universidad de Zaragoza, Zaragoza, Spain; 3. INMA, CSIC, Zaragoza, Spain; 4. Electronic Engineering, University of York, York, United Kingdom*

QOA-03. Nanoflowers vs Nanobiots: Inorganic vs biological agents for cancer theragnosis applications. ***(Invited)*** *E.M. Jefremovas*[1], L. Gandarias[2], L. Marcano[3,4], A. García-Prieto[5], I. Orue[6], A. Muela[2], M. Fernández-Gubieda[4], L. Fernández Barquín[1] and J. Alonso Masa[1] *1. Depto. Ciencias de la Tierra y Física de la Materia Condensada, Universidad de Cantabria, Santander, Spain; 2. Depto. Inmunología, Microbiología y Parasitología, Universidad del País Vasco, Leioa, Spain; 3. Helmholtz–Zentrum Berlin für Materialien und Energie, Berlin, Germany; 4. Depto. Electricidad y Electrónica, Universidad del País Vasco, Leioa, Spain; 5. Depto. Física Aplicada, Universidad del País Vasco, Bilbao, Spain; 6. SGIker Medidas Magnéticas, Universidad del País Vasco, Leioa, Spain*

QOA-04. Synthesis and antigen-antibody reaction of ultrasmall FeCo nanoparticles. *L. Ton That*[1], T. Murayama[2], N. Kobayashi[3], S. Yabukami[1,2], W. Ikeda-Ohtsubo[4] and K. Arai[3] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan; 3. Research Institute for Electromagnetic Materials, Denjiken, Tomiya, Japan; 4. Graduate School of Agricultural Science, Tohoku University, Sendai, Japan*

QOA-05. Structural, Magnetic, and Self-Heating Study of Eu-doped Magnetite Nanoparticles towards the Application of Magnetic Hyperthermia. *K. Hazarika*[1] and J.P. Borah[1] *1. Physics, NIT Nagaland, Dimapur, India*

QOA-06. Enhanced magnetic hyperthermia in $CoFe_2O_4$ nanorods. J. Mohapatra[1], J. George[1], A. Arellano[1] and *J. Liu*[1] *1. Department of Physics, The University of Texas at Arlington, Arlington, Arlington, TX, United States*

QOA-07. Ultra-short pulse magnetic fields on effective magnetic hyperthermia for cancer therapy. *A. Kuwahata*[1], Y. Adachi[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan*

QOA-08. Development of gold-coated magnetic nanoparticles as a theranostic agent for magnetic hyperthermia and micro-CT imaging applications. *L. Ton That*[1], M. Kimura[2], T. Ogawa[1], N. Kitamura[2], Y. Kobayashi[3], K. Gonda[2] and S. Yabukami[1] *1. Graduate School of Engineering, Tohoku University, Sendai, Japan; 2. Graduate School of Medicine, Tohoku University, Sendai, Japan; 3. Graduate School of Science and Engineering, Ibaraki University, Mito, Japan*

QOA-09. Withdrawn

QOA-10. Wireless temperature monitoring by using magnetic nanoparticles for clinical trials on magnetic hyperthermia treatment. *A. Kuwahata*[1], R. Hirota[1], A. Sukhbaatar[1], T. Kodama[1] and S. Yabukami[1] *1. Tohoku University, Sendai, Japan*

QOA-11. **Thermosensitivity Through Exchange Coupling in Ferrimagnetic/Antiferromagnetic Nano-Objects for Spatially Resolved Thermometry.** *F.M. Abel*[1], E. De Lima Correa[1], A.J. Biacchi[1], T.Q. Bui[1], S.I. Woods[1], A.R. Hight Walker[1] and C. Dennis[1] *1. National Institute of Standards and Technology, Gaithersburg, MD, United States*

QOA-12. **Withdrawn**

QOA-13. **Two-Dimensional Imaging Using a Single Sided Field Free Line Magnetic Particle Imaging Scanner.** *C. McDonough*[1] and A. Tonyushkin[1] *1. Physics, Oakland University, Rochester, MI, United States*

QOA-14. **Sub-pT oscillatory magnetometric system using magnetoresistive sensor array for a low-field magnetic particle imaging.** *S. Trisnanto*[1], T. Kasajima[2], T. Akushichi[2] and Y. Takemura[1] *1. Yokohama National University, Yokohama, Japan; 2. TDK Corporation, Tokyo, Japan*

QOA-15. **Rapid Virus Detection using Magnetic Second Harmonics of Superparamagnetic Iron Oxide Nanoparticles.** *R. Hirota*[1], T. Murayama[1], R. Katsumi[2], T. Kawawaki[3], S. Yabukami[1,4], R. Igarashi[5], Y. Negishi[3], M. Kusakabe[6,7], M. Sekino[8], T. Yatsui[2] and A. Kuwahata[1] *1. Graduate School of Engineering, Tohoku University, Aoba-ku, Sendai, Japan; 2. Graduate School of Engineering, Toyohashi University of Technology, Tempaku-cho, Toyohashi, Japan; 3. Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, Kagurazaka, Shinjuku-ku, Japan; 4. Faculty of Engineering, Tohoku Gakuin University, Chuo, Tagajo, Japan; 5. Institute for Quantum Life Science, National Institutes for Quantum and Radiological Science and Technology, Anagawa Inage-ku, Japan; 6. Research Center for Food Safety, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Tokyo, Japan; 7. Matrix Cell Research Institute Inc., Ibaraki, Japan; 8. Graduate School of Engineering, The University of Tokyo, Hongo, Bunkyo-ku, Japan*

QOA-16. **Field induced structural transitions in the para-magnetic enzyme Urease.** *T. Moorsom*[1], M. Chauhan[2], A. Scott[1] and A. Jha[1] *1. University of Leeds, Leeds, United Kingdom; 2. University of York, York, United Kingdom*

Session QOB
MAGNETIC STIMULATION IN BIOLOGY, MAGNETIC FLUIDS AND ACTUATORS
Ahmed El-Gendy, Chair
The University of Texas at El Paso, El Paso, TX, United States

QOB-01. **Beyond conventional neurostimulation: effects of TMS-like magnetic fields on cells and nanomaterials and their potential applications in oncology and regenerative medicine.** ***(Invited)*** B. Heng[1], B. Gunasegaran[1], R. Zeng[1], M. Villanueva[1], S. Ahn[1], S. Clement[2] and *A. Guller*[1] *1. Macquarie Medical School, Macquarie University, Sydney, NSW, Australia; 2. School of Biomedical Engineering, The University of Sydney, Sydney, NSW, Australia*

QOB-02. **Prediction of Stimulation Strength of Transcranial Magnetic Stimulation in the Brain with Deep Convolutional Neural Network based Encoder-Decoder Network.** *M. Alam*[1], M. Tashli[1], J. Gong[2], C.J. Lewis[3], C.L. Peterson[3], H. Eldardiry[2], R.L. Hadimani[1,3] and J. Atulasimha[1,4] *1. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Computer Science, Virginia Tech, Blacksburg, VA, United States; 3. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 4. Electrical and Computer Engineering, Virginia Commonwealth University, Richmond, VA, United States*

QOB-03. **Core – Shell Magnetoelectric Nanoparticles as Wireless, Nanoscale Alternatives to Electrodes for Direct Neural Stimulation.** *E. Zhang*[1], M. Abdel-Mottaleb[2], Y. Akin[1], B. Navarrete[1], M. Alberteris[1], I. Smith[2], B. Yildirim[1], V. Andre[2], M. Shotbolt[2], P. Liang[3] 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. Cellular Nanomed, Irvine, CA, United States*

QOB-04. **Position Control Method of a Robotically Assisted Magnetic Navigation System to Improve the Pushability of a Magnetic Catheter by Maximizing Magnetic Force.** *D. Lee*[1], E. Jung[1], J. Kwon[1] and G. Jang[1] *1. Hanyang University, Seoul, The Republic of Korea*

QOB-05. **Resonant Control Method to Suppress the Self and Mutual Inductances of a 3-phase Magnetic Navigation System for Fast Drilling Motion of Micro Helical Robots.** *J. Kwon*[1], J. Sa[1], D. Lee[1] and G. Jang[1] *1. Hanyang University, Seoul, The Republic of Korea*

QOB-06. **Sawtooth Head Helical Magnetic Robots to Improve Drilling Performance for Robotic Endovascular Intervention.** *J. Sa*[1], J. Kwon[1] and G. Jang[1] *1. Hanyang University, Seoul, The Republic of Korea*

QOB-07. **On Locomotion of Magnetized Spherical Solids in Soft Media.** *D.F. Volchonok*[1], J. Tur[1] and G. Friedman[1] *1. Electrical and Computer Engineering, Drexel University, Philadelphia, PA, United States*

QOB-08. **Development of Magnetorheological Fluids within 3D Printed Elastomeric Cellular Structures with an Accumulator.** *J. Park*[1], Y. Choi[1], A. Flatau[1] and N.M. Wereley[1] *1. University of Maryland, College park, MD, United States*

QOB-09. **Sedimentation of Magnetorheological Fluids Measured Using a Automated Vertical Axis Inductance Monitoring System.** R. Ma[2] and *N.M. Wereley*[1] *1. Aerospace Engineering, University of Maryland, College Park, MD, United States; 2. Jiangsu Normal University, Xuzhou City, China*

QOB-10. **Rod mangle rotation patterns for magnetic field generation.** *C.R. Fernandes*[1], J. Ventura[1] and D. Silva[1] *1. IFIMUP, Institute of physics for advanced materials, nanotechnology and photonics, Faculty of Science of the Porto University, Porto, Portugal*

Session QPA

APPLICATIONS OF MAGNETIC NANOPARTICLES IN BIOMEDICINE (Poster Session)

Eduardo De Lima Correa, Chair
National Institute of Standards and Technology, Gaithersburg, MD, United States

QPA-01. **Estimating transcranial magnetic stimulus resolution using magnetic flux density.** *T. Torii*[1,2], K. Tanabe[2], I. Toda[2], H. Sakamoto[3], A. Sato[1,2] and M. Iwahashi[3] *1. Department of Human Information Engineering, Tokai University, Kumamoto, Japan; 2. Department of Medical Care and Welfare Engineering, Tokai University, Kumamoto, Japan; 3. Department of Clinical Engineering, Komatsu University, Ishikawa, Japan*

QPA-02. **Relationship Between Resting Motor Threshold and Neuroanatomy in Mild to Moderate Traumatic Brain Injury Patients during Transcranial Magnetic Stimulation.** *C.J. Lewis*[1], L.M. Franke[7,5], G.T. Gitchel[5,1], R.A. Perera[6], K.L. Holloway[4,5], W.C. Walker[7,5] and R.L. Hadimani[2,3] *1. Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 2. Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, United States; 3. Psychiatry, Harvard Medical School, Boston, MA, United States; 4. Neurosurgery, Virginia Commonwealth University, Richmond, VA, United States; 5. Hunter Holmes McGuire Verterans Affaris Medical Center, Richmond, VA, United States; 6. Biostatistics, Virginia Commonwealth University, Richmond, VA, United States; 7. Physical Medicine and Rehabilitation, Virginia Commonwealth University, Richmond, VA, United States*

QPA-03. **Development of Novel Transcranial Magnetic Stimulation Technique Using High-frequency Modulation for Treatment of Parkinson's Disease.** *I.C. Carmona-Tortolero*[1], D. Kumbhare[2,4], G. Weistroffer[2,3] and M. Baron[2,5] *1. Dept. of Mechanical and Nuclear Engineering, VIrginia Commonwealth University, Richmond, VA, United States; 2. McGuire Research Institute, Hunter Holmes McGuire VA Medical Center, Richmond, VA, United States; 3. Dept. of Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, United States; 4. Dept. of Neurosurgery, Louisiana State University Health Science, Shreveport, Shreveport, LA, United States; 5. Dept. of Neurology, Virginia Commonwealth University, Richmond, VA, United States*

QPA-04. **Temporal Interference for Increased Focality of Transcranial Magnetic Stimulation.** *J. Boldrey*[1], Z. Higgs[1] and D. Jiles[1] *1. Electrical and Computer Engineering, Iowa State University, Ames, IA, United States*

QPA-05. **Transient phosphene perceptions caused by changes in DC magnetic field: Qualities of its simplicity and reproducibility.** *H. Nakagawa*[1] and S. Ueno[2] *1. Tokyo Denki University, Tokyo, Japan; 2. Kyushu University, Fukuoka, Japan*

QPA-06. ***In vivo* Micromagnetic Stimulation of the Rat Sciatic Nerve.** *R. Saha*[2], Z. Sanger[1], R. Bloom[2], O. Benally[2], K. Wu[2], D. Tonini[2], W. Low[3], S. Keirstead[4,5], T. Netoff[1] and J. Wang[2] *1. Biomedical Engineering, University of Minnesota, Twin Cities, Minneapolis, MN, United States; 2. Electrical & Computer Engineering, University of Minnesota, Twin Cities, Minneapolis, MN, United States; 3. Neurosurgery, University of Minnesota, Twin Cities, Minneapolis, MN, United States; 4. Stem Cell Institute, University of Minnesota, Twin Cities, Minneapolis, MN, United States; 5. Integrative Biology and Physiology, University of Minnesota, Twin Cities, Minneapolis, MN, United States*

QPA-07. **Effect of pulsed magnetic field in murine T lymphoma EL4 cells.** *B. Lee*[1], J. Jung[1], S. Kim[1] and H. Lee[1] *1. Sangji University, Wonju, The Republic of Korea*

QPA-08. **Cancer cell destruction by magneto-mechanical actuation of nanowires compared with nano/micromagnetic particles.** H. Chiriac[1], A.E. Minuti[1,2] and *N. Lupu*[1] *1. National Institute of Research and Development for Technical Phisics, Iasi, Romania; 2. Faculty of Physics, Alexandru Ioan Cuza University, Iasi, Romania*

QPA-09. **Thermo-responsive copolymer coated magnetic liposomes for hyperthermia therapy and controlled drug delivery.** *S.A. Shah*[1] *1. Forman Christian College (University) Lahore, Lahore, Pakistan*

QPA-10. **Magneto-luminescent ferrite-lanthanide complex core-shell nanocomposite as efficient bioimaging and cancer therapy platform.** R. Meena[1], A. Chauhan[2], A. Das[1] and *B.K. Kuanr*[1] *1. Special Centre for Nanoscience, Jawaharlal Nehru University, New Delhi, India; 2. Institute of Nanoscience and Technology, Mohali, India*

QPA-11. **Biocompatible Superparamagnetic $NiFe_2O_4$ Nanoparticles for Magnetic Hyperthermia Treatment using a ZVS Circuit.** *T. Moriwaki*[1], K. Ohara[2], K. Nakazawa[1], T. Sakamoto[2], K. Nii[2], M. Abe[3] and Y. Ichiyanagi[2] *1. Natural Environment, Yokohama National University, Yokohama, Japan; 2. Physics, Yokohama National University, Yokohama, Japan; 3. Graduate School of Eng. Sci., Osaka University, Toyonaka, Japan*

QPA-12. **Proposal of a Transmitting and Receiving Coil Configuration Focusing on Contactless Power Supply to Biometric Information Acquisition Devices for Small Experimental Animals.** *T. Omori*[1], F. Sato[1], F. Yoshiki[2] and S. Sasaki[2] *1. Tohoku-gakuin university, Tagajo, Japan; 2. Hikaridenshi Co., Ltd., Osaki, Japan*

QPA-13. **Development of Colloidal Magnetic Nano-objects with Strong Liquid-Phase AC Field Response for Remote 3D Thermometry and Sensing.** *A.J. Biacchi*[1], T.Q. Bui[1], F.M. Abel[1], E. De Lima Correa[1], C.A. Richter[1], C. Dennis[1], S.I. Woods[1] and A.R. Hight Walker[1] *1. National Institute of Standards and Technology (NIST), Gaithersburg, MD, United States*

QPA-14. **Mixed Brownian alignment and Néel rotations in superparamagnetic iron oxide nanoparticle suspensions driven by an AC field.** *S.A. Shah*[1] and K.M. Krishnan[2] *1. Forman Christian College (University) Lahore, Lahore, Pakistan; 2. University of Washington, Seattle, WA, United States*

QPA-15. **Frequency Domain Studies on Single- and Multi-core Magnetic Nanoparticles in Volumetric Magnetic Particle Spectroscopy (MPS).** *V.K. Chugh*[1], K. Wu[1,2], V.D. Krishna[3], M.C. Cheeran[3] and J. Wang[1] *1. Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN, United States; 2. Department of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, United States; 3. Department of Veterinary Population Medicine, University of Minnesota, St. Paul, MN, United States*

QPA-16. **Portable Magnetoresistive Device for the Simultaneous Detection of Dengue RNA and Anti-dengue Antibodies.** *D. Albuquerque*[1,2], V.C. Martins[1], E. Fernandes[3], D.M. Caetano[1], L. Zé-Zé[4,5], M. Alves[4] and S. Cardoso[1,2] *1. INESC MN - Instituto de Engenharia de Sistemas E Computadores – Microsistemas e Nanotecnologias, Lisboa, Portugal; 2. IST - Instituto Superior Técnico, Lisboa, Portugal; 3. INL - International Nanotechnology Laboratory, Braga, Portugal; 4. INSA-CEVDI - National Institute of Health Doutor Ricardo Jorge, Centre for Vectors and Infectious Diseases Research, Águas de Moura, Portugal; 5. BioISI - Biosystems and Integrative Sciences Institute, Lisboa, Portugal*

QPA-17. **Analysis of Fe element and interferon gamma in serum and spleen homogenates after injection of silica coated magnetic nanoparticles (SiO_2-Fe_3O_4).** *M. Hasan*[1,2], J. Choi[1], H. Akter[1] and S. Lee[1] *1. Department of Digital Healthcare Engineering, Sangji University, Wonju, The Republic of Korea; 2. Department of Biochemistry and Molecular Biology, Bangabandhu Sheikh Mujibur Rahman Science and Tech. University, Gopalganj, Bangladesh*

QPA-18. **Easy synthesis of monodisperse Co/Zn-based ferrite nanoparticles and their antifungal activities on *Botrytis cinerea*.** *S. Michea*[1,3], R.M. Freire[2,3], C. Robles-Kelly[4], C. Infante[4] and E. Silva[2,4] *1. Applied Chemical Science Institute, Universidad Autónoma de Chile, Santiago, Chile; 2. Instituto de Investigaciones Agropecuarias, Santiago, Chile; 3. Center for Development of Nanoscience and Nanotecnology, Santiago, Chile; 4. Instituto de Ciencias Biomedicas. Universidad Autonoma de Chile, Santiago, Chile*

POSTER SESSIONS

Session QPB
MANIPULATION OF MAGNETIC FLUIDS (Poster Session)

Norman Wereley, Chair
University of Maryland, College Park, MD, United States

QPB-01. **Simple Synthesis of Magnetic Nanomaterials by Microfluidics Process.** *V. Singh*[1] and R. Singh[2] *1. School of Engineering Science and Technology, University of Hyderabad, Hyderabad, India; 2. School of Physics, University of Hyderabad, Hyderabad, India*

QPB-02. **Dynamics of magnetic fluids and bidisperse magnetic systems undergoing oscillatory shear.** E. Shel'deshova[1], *E. Sokolov*[1] and P. Ryapolov[1] *1. Southwest State University, Kursk, Russian Federation*

QPB-03. **Wireless Manipulation of a Self-Assembled Magnetic Millirobot with a Multi-Modular Ring Structure Using an External Magnetic Field.** *Y. Lee*[1], D. Lee[1] and S. Jeon[1] *1. Mechanical and Automotive Engineering, Kongju National University, Cheonan, The Republic of Korea*

QPB-04. **Design and Performance of A 3D-Printed Magnetorheological Fluid-Based Adaptive Vibration Isolator.** *Y. Choi*[1], B. Yoo[1], J. Park[1] and N.M. Wereley[1] *1. Department of Aerospace Engineering, University of Maryland, College Park, MD, United States*

QPB-05. **Magnetoactive Properties of Biocompatible Magnetic Hydrogel Composites: Effects of Magnetic Particulate Type and Magnetic Annealing.** *J. Schewe*[1], J.M. Ennis[1], J. Lu[1], W.M. Howell[1], D.P. Fagan[1], T. Höft[2] and B. Nelson-Cheeseman[1] *1. Mechanical Enginneering, University of St. Thomas, St. Paul, MN, United States; 2. Mathematics, University of St. Thomas, St. Paul, MN, United States*

QPB-06. **Magnetic MOF composite material for decontamination of direct red 81 from polluted water.** *M.E. Ossman*[1] *1. Environment and Natural Materials Research Institute, SRTA City, Alexandria, Egypt*

QPB-07. **Withdrawn**

QPB-08. **High-precision 3D Reconstruction of Multiple Magnetic Targets Based on Center Weighting Method.** *T. Lan*[1], J. Qiu[1], Y. Li[1], H. Sun[1] and S. Huang[1] *1. Key Laboratory of Optoelectronic Technology and System of Ministry of Education, College of Optoelectronic Engineering, Chongqing University, Chongqing, China*

QPB-09. **Adaptive Cascade Detection of Weak Magnetic Anomalies Based on Marine Predators Algorithm-Stochastic Resonance.** *H. Sun*[1], Z. Wang[1], T. Lan[1], S. Zhang[1] and J. Qiu[1] *1. Key Laboratory of Optoelectronic Technology and System of Ministry of Education, College of Optoelectronic Engineering, Chongqing University, Chongqing, China*

ORAL SESSIONS

Session ROA

MAGNETIC CHARACTERIZATION FROM NANO TO MACRO

Peter Fischer, Co-Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States
Alpha N'Diaye, Co-Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States

ROA-01. **Development of a variable frequency, low current, low volume hysteresis loop tracer.** D.M. Clarke[1] and *G. Vallejo-Fernandez*[1] *1. Physics, University of York, York, United Kingdom*

ROA-02. **Development of a compact magnet for applying a highly uniform magnetic field to a diamond magnetic sensor by inverse problem analysis.** *H. Tanaka*[1], Y. Murata[2], S. Yabukami[2] and A. Kuwahata[1] *1. Graduate School of Engineering, Tohoku University, Aobaku,Sendai, Japan; 2. Graduate School of Biomedical Engineering, Tohoku University, Aobaku, Sendai, Japan*

ROA-03. **Withdrawn**

ROA-04. **The Detection Limit of an Open-Source Magnetic Particle Spectrometer.** *E. Mattingly*[1,2], A. Barksdale[3,2], E.E. Mason[2] and L. Wald[4,2] *1. Health Sciences and Technology, Massachusetts Institute of technology, Cambridge, MA, United States; 2. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown, MA, United States; 3. Electrical Engineering, Massachusetts Institute of Technology, Cambridge, MA, United States; 4. Radiology, Harvard Medical School, Boston, MA, United States*

ROA-05. **Scanning thermoelectric microscopy: applied to topological soliton systems.** ***(Invited)*** *C.W. Barton*[1], R. Puttock[1], E. Saugar[2], P. Klapetek[3], A. Fernandez-Scarioni[4], P. Frietas[5], K. Zeissler[1,6], A. Sola[7], V. Basso[7], M. Pasquale[7], H. Schumacher[4], T.A. Ostler[8], O. Chubykalo-Fesenko[2], C. Marrows[6] and O. Kazakova[1] *1. National Physical Laboratory, Teddington, United Kingdom; 2. Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Madrid, Spain; 3. Czech Metrology Institute, Brno, Czechia; 4. Physikalisch-Technische Bundesanstalt, Braunschweig, Germany; 5. Instituto de Engenharia de Sistemas e Computadores (INESC-MN), Lisbon, Portugal; 6. University of Leeds, Leeds, United Kingdom; 7. Istituto Nazionale di Ricerca Metrologica, Turin, Italy; 8. Sheffield Hallam University, Sheffield, United Kingdom*

ROA-06. **Automated Acquisition of Switching Dynamics in Reflexion Mode of MRAM Magnetic Tunnel Junctions.** *S. Lequeux*[1], M. Mansueto[1], Q. Stainer[1], A. Bussiere[1], G. Zahnd[1], A. Chavent[1] and S. Salimy[1] *1. Hprobe, Grenoble, France*

ROA-07. **Exploring antiferromagnetic resonances of NiO with frequency-domain THz spectroscopy.** *T. Jeffrey*[1], W. Wu[2], J. Avenoso[2], L. Gundlach[2], J. Xiao[2], M. Jungfleisch[2] and J. Sklenar[1] *1. Physics and Astronomy, Wayne State University, Detroit, MI, United States; 2. Physics and Astronomy, University of Delaware, Newark, DE, United States*

ROA-08. **A Ferris-wheel ferromagnetic resonance technique for measurement of spin currents at the wafer level.** *A. Rothschild*[1], N. Am-Shalom[1], N. Bernstein[1], M. Meron[1], T. David[1], E. Frohlich[1], B. Assouline[1] and A. Capua[1] *1. The Hebrew University of Jerusalem, Jerusalem, Israel*

ROA-09. **Neural Networks for Pattern Detection in Noisy signals for Eddy-current-based Non-Destructive Testing.** *D.M. Caetano*[1,2] and S. Cardoso[3,2] *1. Advanced Sensor Interfaces and Circuits, INESC MN, Lisbon, Portugal; 2. Instituto Superior Técnico, Lisbon, Portugal; 3. SPINTRONICS AND MAGNETIC BIOSENSORS, INESC MN, Lisbon, Portugal*

ROA-10. **Trapped Flux Induced Artifacts in Magnetization Measurements of Thin Films Grown on Large Paramagnetic Substrates.** *M. Roos*[1] and B. Zink[1] *1. Physics and Astronomy, University of Denver, Denver, CO, United States*

ROA-11. **Angular Dependence of Spin Polarization in Negatively Charged NV Defects in Diamond under Laser Illumination.** *A. Patel*[1], Z. Chowdhry[2] and P. Bhallamudi[2,1] *1. Electrical Engineering, Indian Institute of Technology, Madras, Chennai, India; 2. Physics, Indian Institute of Technology, Madras, Chennai, India*

ORAL SESSIONS

Session ROB
RECENT ADVANCES IN MAGNETIC IMAGING

Roopali Kukreja, Co-Chair
University of California, Davis, Davis, CA, United States
Nanna Zhou Hagström, Co-Chair
Stockholm University, Stockholm, Sweden

ROB-01. **Magnetization Reversal and Domain Structures in Perpendicular Synthetic Antiferromagnets Prepared on Rigid and Flexible Substrates.** *S. Mohanty*[1], M. Sharma[1], A.K. Moharana[1], B. Ojha[1], E. Pandey[1], B.B. Singh[1] and S. Bedanta[1] *1. Physics, National Institute of Science Education and Research, Bhubaneswar, Jatni, India*

ROB-02. **Phase Coexistence and Transitions between Anti- and Ferromagnetic States in a Synthetic Antiferromagnet.** *C.E. Barker*[1], C.W. Barton[2], E. Haltz[1], F. Maccherozzi[3], B. Sarpi[3], S. Dhesi[3], O. Kazakova[2], T.A. Moore[1] and C. Marrows[1] *1. School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom; 2. Quantum Technologies, National Physical Laboratory, Teddington, United Kingdom; 3. Diamond Light Sourice ltd, Harwell, United Kingdom*

ROB-03. **Investigation of Ferro- and Antiferromagnetic Memory Structures using Scanning NV Magnetometry.** *P.S. Rickhaus*[1], U. Celano[2], L. Zaper[1], A. Stark[1], M. Munsch[1], H. Zhong[1], C. Adelmann[2], P. van der Heide[2], A. Finco[4], V. Jacques[4], V. Garcia[5] and P. Maletinsky[3] *1. Qnami AG, Basel, Switzerland; 2. IMEC, Loewen, Belgium; 3. Departement of Physics, University of Basel, Basel, Switzerland; 4. Université de Montpellier, Montpellier, France; 5. CNRS Thales, Paris-Saclay, France*

ROB-04. **Magnetization Reconstruction Of Skyrmionic Textures From Lorentz TEM With Convolutional Neural Network.** ***(Invited)*** Y. Ren[1,2], X. Chen[1], *J. Kong*[3], H. Tan[1], H. Tan[1] and A. Soumyanarayanan[1,2] *1. Institute of Materials Research and Engineering, A*STAR, Singapore, Singapore; 2. Department of Physics, National University of Singapore, Singapore, Singapore; 3. Institute of High Performance Computing, A*STAR, Singapore, Singapore*

ROB-05. **Phase Coexistence in a Chiral Synthetic Antiferromagnet Observed Using Lorentz Transmission Electron Microscopy.** *K. Fallon*[1], C.E. Barker[2], C. Kirkbride[1], S. Villa[1], D. McGrouther[1], T.A. Moore[2], G. Burnell[2], C. Marrows[2] and S. McVitie[1] *1. University of Glasgow, Glasgow, United Kingdom; 2. University of Leeds, Leeds, United Kingdom*

ROB-06. **Ultrafast Lorentz Microscopy with Magnetic Field Excitation at Microwave Frequencies.** *J.T. Weber*[1], N. Porwal[1], A. Wendeln[1], M. Winklhofer[1] and S. Schäfer[1] *1. University of Oldenburg, Oldenburg, Germany*

ROB-07. **Mapping In-situ Morphological Phase Transitions of Magnetic Domains in $[Co/Pt]_N$ under applied magnetic field.** *M.M. Vaka*[1], J. Ray[1], C. Richards[1], O. Hellwig[2] and K. Chesnel[1] *1. Physics and Astronomy, Brigham Young University, Provo, UT, United States; 2. Chemnitz University of Technology, Chemnitz, Germany*

ROB-08. **Skyrmion detection with U-Net.** *T.B. Winkler*[1], I. Labrie-Boulay[1], A. Romanova[1], D. Franzen[2], H. Fangohr[3,4] and M. Kläui[1] *1. Institut für Physik, Johannes Gutenberg University, Mainz, Germany; 2. Institut für Informatik, Johannes Gutenberg Universität, Mainz, Germany; 3. Scientific Support Unit for Computational Science, Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany; 4. Computational Modelling Group, Faculty of Engineering and Physical Sciences, University of Southampton, Southampton, United Kingdom*

ROB-09. **Revealing 3D Magnetic Textures in $[Pt/Co/Cu]_{15}$ Multilayers by Coherent X-ray Imaging with 5 nm Resolution.** *R. Battistelli*[1*], S. Zayko[2], K. Bagschik[3], C.M. Günther[4], J. Fuchs[5], K. Gerlinger[5], L. Kern[5], D. Metternich[1], M. Schneider[5], D. Engel[5], S. Eisebitt[5], B. Pfau[5] and F. Büttner[1] *1. QM-NMAX, Helmholtz-Zentrum Berlin, Berlin, Germany; 2. Georg-August-Universität Göttingen, Göttingen, Germany; 3. Deutsches Elektronen-Synchrotron, Hamburg, Germany; 4. Technische Universität Berlin, Berlin, Germany; 5. Max Born Institute, Berlin, Germany*

ROB-10. **X-ray vector magnetic tomography of Bloch points in magnetic microstructures and multilayers.** J. Hermosa[1,2], A. Hierro-Rodríguez[1,2], A. Sorrentino[3], C. Quiros[1,2], J. Martin[1,2], L. Alvarez Prado[1,2], L. Aballe[3], E. Pereiro[3], *M. Velez*[1,2] and S. Ferrer[3] *1. Physics Dept., Universidad de Oviedo, OVIEDO, Spain; 2. CINN (CSIC-Univ. Oviedo), El Entrego, Spain; 3. Alba Synchrotron, Cerdanyola del Vallès, Spain*

ROB-11. **Self-Assembly as a Tool to Study Strain-Dependent Magnetic Properties.** *B. Singh*[1], J.A. Otalora Arias[2], T.H. Kang[1], I. Soldatov[1], D.D. Karnaushenko[3], C. Becker[3], R. Schäfer[1], D. Karnaushenko[3], V. Neu[1] and O.G. Schmidt[3,4] *1. Leibniz IFW Dresden, Dresden, Germany; 2. Universidad Católica del Norte, Antofagasta, Chile; 3. Center for Materials Architectures and Integration of Nanomembranes (MAIN), Chemnitz, Germany; 4. TU Chemnitz, Chemnitz, Germany*

ROB-12. **Three-Dimensional Nucleation Kinetics Through the First-Order Metamagnetic Phase Transition in B2-Ordered FeRh.** *J. Massey*[1,2], S. Treves[1,2], A. Apseros[1,2], S. Finizio[3], M.T. Grimes[1,2], J. Reuteler[4], C. Donnelly[5,6], T. Thomson[7], L. Heyderman[1,2] and V. Scagnoli[1,2] *1. Laboratory for Mesoscopic Systems, ETH Zurich, Zurich, Switzerland; 2. Laboratory for Multiscale Materials Experiments, Paul Scherrer Institut, Villigen, Switzerland; 3. Photon Science Department, Paul Scherrer Institut, Villigen, Switzerland; 4. ScopeM, ETH Zurich, Zurich, Switzerland; 5. Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 6. Max Planck Institute for Chemical Physics of Solids, Dresden, Germany; 7. NEST Research Group, The University of Manchester, Manchester, United Kingdom*

POSTER SESSIONS

Session RPA

MAGNETIC CHARACTERIZATION AND IMAGING (Poster Session)

Hendrik Ohldag, Co-Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States
Thomas Feggeler, Co-Chair
Lawrence Berkeley National Laboratory, Berkeley, CA, United States

RPA-01. **Influence of stress on the magnetic properties of ultra-thin silicon steel in high frequency range.** Y. Li[1], *S. Song*[1], Y. Dou[1] and T. Chen[1] *1. School of Electrical Engineering, Hebei University of Technology, TianJin, China*

RPA-02. **A Novel Method for Measuring Residual Flux Density of the Single-Phase Transformer Based on Phase Difference.** Y. Wang[1], *Y. Ren*[1] and C. Liu[1] *1. Hebei University of Technology, Tianjin, China*

RPA-03. **A New Inductor Power Loss Model for Boost Converter during the Voltage Conversion Based on the Jiles-Atherton Model.** J. Lee[3], K. Nidhi[1], *C. Li*[2,3], T. Liao[1] and K. Chen[2] *1. ESD Department, Richtek Technology Corp., ChuPei, Taiwan; 2. Department of Electrical and Computer Engineering, National Yang Ming Chiao Tung University, Hinschu, Taiwan; 3. Device Engineering, Vanguard international semiconductor Cop., Hinschu, Taiwan*

RPA-04. **Origins of potential observational errors in field sweeping DC measurements for unidirectional magnetoresistance.** *Y. Fan*[1], R. Saha[1], Y. Yang[1] and J. Wang[1] *1. Electrical Engineering, University of Minnesota, Minneapolis, MN, United States*

RPA-05. **Analysis of Nuclear Magnetic Resonance Metabolomics data for the detection of unborn baby health problems using deep learning.** *P. Kumar*[1], S. Amara[1], D. Khan[1] and Y. Massoud[1] *1. Computer, Electrical and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia*

RPA-06. **Role of Aggregation Dynamics in Magneto-Optical Scattering by Superparamagnetic Nanoparticles.**
N. Fried[2], W.J. Li[3] and *M. Syed*[1] *1. Physics, Rose-Hulman Institute of Technology, Terre Haute, IN, United States; 2. Institute of Physical Science & Technology, University of Maryland, College Park, MD, United States; 3. Physics, University of Maryland, College Park, MD, United States*

RPA-07. **Evaluation of detection technique of magnetic nanoparticles using pulsed magnetic field.** *M. Nishida*[1], S. Tanaka[1], M. Futagawa[1], Y. Takemura[2] and S. Ota[1] *1. Shizuoka University, Hamamatsu, Japan; 2. Yokohama National University, Yokohama, Japan*

RPA-08. **Syntheses and Characterization of Core-Shell Iron-Based Magnetic Nanoparticles Dispersed in Carbon Matrix.**
F.M. Iglesias[1], H. Gyulasaryan[2], G. Chilingaryan[2], C. Alvarado[1], J. Gray[3], A. Manukyan[2], O. Bernal[1] and A.N. Kocharian[1] *1. Physics and Astronomy, California State University, Los Angeles, CA, United States; 2. Institute for Physical Research of NAS of Armenia, Ashtarak, Armenia; 3. Materials Characterization Lab, Pennsylvania State University, University Park, PA 16802, PA, United States*

RPA-09. **Preparation of probes for high-resolution magnetic force microscopy by orientation control of FePt layer.**
S. Watanabe[1], S. Nemoto[1], M. Doi[1] and T. Shima[1] *1. Tohoku Gakuin University, Tagajo, Japan*

- A -

*Best student presentation award finalist

- B -

*Best student presentation award finalist

*Best student presentation award finalist

- C -

*Best student presentation award finalist

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*Best student presentation award finalist

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