UFFC Latin America Ultrasonics Symposium
May 8-10, Montevideo, Uruguay

IEEE LAUS 2024
SYMPOSIUM PROCEEDINGS

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Table of Contents

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2024 IEEE LAUS Welcome Message

Dear Esteemed Colleagues and Participants,

It is with great pleasure and enthusiasm that we welcome you to the second edition of the IEEE UFFC Latin America Ultrasonics Symposium (LAUS 2024). This edition of the symposium takes place at the Intendencia de Montevideo in the vibrant city of Montevideo, Uruguay. LAUS was envisioned to welcome researchers from across the globe, providing a genuine opportunity to showcase their work, establish scientific connections, and gain insight into the research conducted in Latin America, as well as its regional and international collaborations. Montevideo, home to some of the oldest ultrasound research groups in Latin America with extensive worldwide collaboration networks, epitomizes the spirit of LAUS and was selected as the location for the first in-person edition of LAUS.

The success of the first LAUS virtual edition in 2021 served as a catalyst, increasing interaction and collaboration within our community. We believe that this in-person 2024 edition will further strengthen our bonds and foster greater collaboration with other regions of the world. The numbers and geographical distribution of the received submissions corroborate LAUS's vision and goals, receiving submissions from 21 countries worldwide with 68% coming from Latin American countries.

We have made deliberate efforts to ensure that LAUS 2024 is inclusive and accessible to all, regardless of geographical and economic constraints. This includes offering affordable conference fees, travel support for students, short courses with integrated hands-on components available free of charge for student registrants, and a hybrid conference format.

To help us achieve the goals of this Latin America initiative, in addition to the short courses (including a pre-conference full day course at the Facultad de Ciencias, Universidad de la República) we have organized student networking sessions and a discussion panel focused on the retention of women in academia. The scientific sessions feature original paper presentations, as well as plenary and invited talks from world leaders in the field of ultrasonics.

For those attending in person, we hope you will enjoy the conference dinner in the Empire Room of the prestigious Club Uruguay, providing a unique opportunity for networking and camaraderie among attendees and the chance to savor typical Uruguayan flavors.

We would like to express our heartfelt gratitude to the organizing committee and local committee for their tireless efforts, dedication, and hard work in making this symposium a success.

The event is made possible by the generous sponsorship and support of the IEEE UFFC-S. We extend our sincere appreciation to our patrons, Verasonics and the Focused Ultrasound Foundation, for their invaluable support. We are also grateful for the support from Uruguayan institutions: Facultad de Ciencias, the Comisión Sectorial de Investigación Científica (CSIC) of the Universidad de la República, the Programa para el Desarrollo de las Ciencias Básicas (PEDECIBA), and the Intendencia de Montevideo. Additionally, we are pleased to highlight that the conference has been declared of Tourist Interest by the Ministry of Tourism of Uruguay, underscoring the cultural and scientific significance of this event.

We look forward to meeting each of you in Montevideo and hope you will thoroughly enjoy your experience at the conference.

Warm regards,

Javier Brum
General Co-Chair
IEEE LAUS 2024

Theo Pavan
General Co-Chair
IEEE LAUS 2024

Roberto Lavarello
Technical Program Co-Chair
IEEE LAUS 2024

Glauber Silva
Technical Program Co-Chair
IEEE LAUS 2024

2024 IEEE LAUS Plenary Speakers

Wednesday, May 8
3:00 PM - 4:00 PM

Dr. Mark E. Schafer
PhD, FAIUM, FASA, FAIMBE Drexel University, Philadelphia, PA

Dr. Schafer is a Research Professor at Drexel University's School of Biomedical Engineering, Science and Health Systems. He holds a Ph.D. in Biomedical Engineering (Drexel University), an M.S. in Acoustics (Pennsylvania State University) and an S.B in Electrical Engineering (Massachusetts Institute of Technology). He has over 35 years of medical industry experience, specifically in ultrasound technologies, and is named inventor on over 30 U.S. Patents. He is a serial entrepreneur, having founded his first company in 1984 while still in graduate school, and is an internationally recognized expert in ultrasound dosimetry, transducer and system development, intellectual property, and regulatory affairs. He has been involved in ultrasound system development for cardiac monitoring, lithotripsy (kidney stone crushing), phacoemulsification (cataract removal), ophthalmic imaging, stroke and peripheral blood clot treatment, antibacterial applications, and neuromodulation. He is currently President of the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC-S); Board Member of the Ultrasonic Industry Association (UIA), and has served on the Board of Governors of the American Institute of Ultrasound in Medicine (AIUM); and is a Fellow of the AIUM, the Acoustical Society of America, and the American Institute

Designing Ultrasound Systems for Brain Research Across Different Spatial Scales

There has recently been a surge of interest in applying ultrasound to the brain as a direct or adjunctive therapeutic agent. Ultrasound energy is already being used in clinical pilot studies to treat such neurological issues as anxiety, depression and even coma, and to facilitate the uptake of drugs through the blood brain barrier. However, there are still fundamental questions regarding the nature of ultrasound interaction with neural tissues.

A critical part of answering these questions is the development of ultrasound sources to meet unique exposure requirements. This talk describes the design of ultrasound exposure systems applicable to a wide range of experimental situations, from fruit flies (Drosophila melanogaster), through rodents, and to humans, representing six orders of magnitude in brain tissue volume. Each situation involves specific requirements of source size, frequency, exposure volume, output control, dosimetry and safety. First, the design details of a sub-millimeter 100kHz exposure source for stimulation of fruit fly neurons will be presented. Here, the primary challenge was creating a source that would fit into a 300μm aperture; the final design borrowed from both the ultrasound surgical and industrial domains. The source generated a uniform spherical sound field that could induce either exhibitory or inhibitory effects in the fruit fly. Moving up in scale, a 2MHz transducer was designed to expose select portions of a rodent brain, leaving nearby areas unexposed to serve as a control. Simulations of the ultrasound beam were conducted and confirmed by hydrophone measurements. Experiments demonstrated an increased uptake of exosomes within the brain, without the use of microbubbles. Finally, a system for clinical (human) use had completely different design requirements that emphasized magnetic resonance imaging (MRI) and optical guidance, as well as safety and the capability to conduct double blind studies. This design used 650kHz transducers, as a compromise between focusing strength and attenuation loss through the skull. The design included internal MRI and external optical tracking markers along with a comprehensive approach to exposure control. Clinical data show positive results for several neurological conditions, such as anxiety, coma, and essential tremor, with no patient safety issues. In summary, ultrasound transducer technology has the flexibility to encompass a wide range of experimental requirements, supporting new areas of research and discovery in brain science

Thursday, May 9
10:30 AM - 11:30 AM

Prof. Mathias Fink
ESPCI ParisTech, France

Mathias Fink is the George Charpak Professor at the Ecole Superieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI Paris) where he founded in 1990 the Laboratory “Ondes et Acoustique” that became in 2009 the Langevin Institute. He is member of the French Academy of Science and of the National Academy of Technologies of France. In 2008, he was elected at the College de France on the Chair of Technological Innovation. He has received several scientific awards as the Silver Medal of CNRS, the CNRS Medal of innovation, the High Prize Yves Rocard and the Louis Neel Prize of the French Physical Society, the Helmholtz-Rayleigh Award of the Acoustical Society of America, the Rayleigh Award of the IEEE Ultrasonics Society and the Edwin H. Land Medal of the Optical Society of America.

Mathias Fink’s area of research is concerned with the propagation of waves in complex media. His current research interests include wave control in complex media, time-reversal in physics, ultrasound medical imaging, multi-wave imaging, wireless communications, metamaterials, time-varying medium, super-resolution. With his colleagues, he pioneered different inventions in medical imaging (ultrafast ultrasonic imaging, matrix Imaging, transient elastography, shear wave elastography, supersonic shear imaging) and in the field of telecommunications (Time-reversal processing and Reconfigurable intelligent surfaces). 7 start-up companies with more than 500 employees have been created from his research (Echosens, Sensitive Object, Supersonic Imagine, Time Reversal Communications, CardiaWave, Austral DX and GreenerWave).

From Ultrasound Time-Reversal Mirrors to Matrix Imaging

Can we make a wave revive its past life? The development of ‘time-reversal mirrors’ for different types of waves — ultrasound, microwave and visible light — has made it possible to exploit time reversibility. Such devices bounce waves back and forth with a target like a game of tennis, with the waves becoming more focused over time. These instruments offer original solutions for imaging complex disordered environments.

In this lecture, I will show how medical imaging of complex tissues with ultrasound or light in reflection mode can be revisited based on the concept of time-reversal processing. I will show that, with a multi-illumination strategy, recording a reflection matrix from this media provides enough information to compensate for any distortion effects in the tissues and to develop new ultrasonic biomarkers. This is the domain of ‘matrix imaging’ developed both for ultrasound imaging and deep optical coherent tomography (OCT).

2024 IEEE LAUS Invited Speakers

Wednesday, May 8
4:30 PM – 5:00 PM

Jean Luc Gennisson

Université Paris-Saclay, CNRS Research Director, France

Biomechanical Parameters for in Vivo Muscle Characterization

Since joining the CNRS (the French National Center for Science) in 2005 as a tenured researcher, I have mainly developed the ultrafast ultrasound imaging technique and especially the elastography technique to quantify stiffness of biological tissue. I drove more than 15 clinical protocol on elastography development. This work took the continuation of my Ph.D. which concerned a 1D ultrasound imaging device, the "Fibroscan®" which is now commercialized by the company Echosens® and use for the clinical diagnosis of liver fibrosis. During these years of development, I have contributed improving the elastography technique by creating new 2D and 3D modes, allowing the quantification of other mechanical parameters of tissues such as: viscosity, anisotropy, elastic nonlinearity. Based on these prior works done in the laboratory, the company Supersonic Imagine® created in 2005, has commercialized the ultrafast ultrasound scanner Aixplorer® since 2009. Our close relationship with this company offered us the opportunity to get access to quality and programmable ultrasound scanners. As a result, I have been able to file several patents related to the technological development coming from the company. In 2014, we have conceptualized and built a first 4D ultrafast ultrasound platform to provide volume information's in elastography but with no real-time approach. At last, from ultrafast ultrasound imaging, I have contributed as a co-founder, to the development of the Neuroflows® Company in 2016 (that became Iconeus® in 2018) which is focused on functional ultrasound imaging and new approaches allowing the understanding of brain function in neuroscience. In 2017 I moved to IR4M laboratory that became BIOMAPS laboratory in 2020, to become head of the team "Methodological developments and instrumentation in TEP, MRI and US)".

Thursday, May 9
8:30 AM – 9:00 AM

Marco Aurélio Brizzotti Andrade

Institute of Physics, University of São Paulo, São Paulo, Brazil

Simulation of the Acoustic Radiation Force on a Small Rigid Sphere Generated by an Array of Transducers

Marco A. B. Andrade is an associate professor at the Institute of Physics of University of São Paulo, Brazil and his main research interest is to develop new strategies to levitate and manipulate objects with sound. He received the bachelor's degree in physics from the Institute of Physics, University of São Paulo, Brazil in 2004, and M.S. and D.Sc. degrees in Mechanical Engineering from Polytechnic School, University of São Paulo in 2006 and 2010, respectively.

Thursday, May 9
4:30 PM – 5:30 PM

Stanislav Emelianov, Ph.D.

Georgia Institute of Technology and Emory University Medical School
Georgia Research Alliance Eminent Scholar and Joseph M. Pettit Professor

Synergy and Applications of Ultrasound, Photoacoustic and Elasticity Imaging

Dr. Emelianov is the Director of the Ultrasound Imaging and Therapeutics Research Laboratory where projects are focused on the discovery, development and clinical translation of diagnostic imaging and image-guided therapy augmented with theranostic nanoagents. Throughout his distinguished career at the University of Michigan, the University of Texas at Austin, and currently at Georgia Tech and Emory, Dr. Emelianov has been at the forefront of advancing functional, cellular, and molecular imaging methods. These methods are designed to detect and diagnose various pathologies, particularly cancer, while aiding in treatment planning, improving image-guided therapy, and monitoring treatment outcomes. In recognition of his groundbreaking contributions to the field, Dr. Emelianov has been named a Fellow of the American Institute for Medical and Biological Engineering (AIMBE), Institute of Electrical and Electronics Engineers (IEEE), Acoustical Society of America (OSA), and Society of Photographic Instrumentation Engineers (SPIE).

Friday, May 10
11:40 AM – 12:10 PM

Matthew Urban

Mayo Clinic College of Medicine and Science Ultrasound Research Laboratory

Evaluating Vascular Mechanical Properties with Ultrasound and Computational Approaches

Matthew W. Urban received the B.S. degree in electrical engineering at South Dakota State University, Brookings, SD in 2002 and the Ph.D. in biomedical engineering at the Mayo Clinic College of Medicine in Rochester, MN in 2007. He is currently an Associate Professor of Biomedical Engineering and has a primary appointment in the Department of Radiology. His current research interests are ultrasonic signal and image processing, shear wave elastography, and optical coherence elastography. Dr. Urban is a Senior Member of IEEE and is a Fellow of the American Institute of Ultrasound in Medicine, and a Fellow of the Acoustical Society of America.

Friday, May 10
2:30 PM – 3:00 PM

Rodrigo Costa-Felix

Brazilian National Institute of Metrology, Quality, and Technology (Inmetro) Laboratory of Ultrasound, Brazil

Basics of Uncertainty Assessment for Ultrasound Applications: Speed of Sound and Ultrasonic Power

Rodrigo Costa-Felix has a degree in Mechanical Engineering (1995), a Master's degree in Mechanical Engineering with an emphasis in Psychoacoustic (1996) and a Doctor's degree in Biomedical Engineering (2005) with emphasis on Ultrasound Metrology. He has been a metrology and quality researcher at the Brazilian National Metrology Institute (Inmetro) since 1996 and the head of the Laboratory of Ultrasound since 2008.

He has been training human resources and intellectual capital, having taught over 35 short courses and more than 50 lectures or seminars. Rodrigo is a professor in the Post-graduate Program in Metrology and Quality (2009-present), the Post-Graduate Program in Biotechnology (2013-present), and the Post-Graduate Program in Metrology (2019-present), all of them belonging to Inmetro. He is presently the Coordinator of Inmetro's Post-Graduate Program in Metrology and worked as Coordinator of the Post-Graduate Program in Biotechnology (2017-2021).

He has been a full member of the Brazilian Society of Biomedical Engineering (SBEB) since 2006, in which he served as Secretary (2006-2008), Treasurer (2009-2010), SBEB Board Member (2013-2014), Vice-President (2015-2016), Secretary (2017-2018), President (2019-2020), and now is a Board Member (2023-2024). He has been a Member of the Brazilian Society of Metrology (SBM) since 2014, of which he worked as a member of the Financial Council (2014-2015), Vice-President (2016-2018; 2018-2020; 2020-2022), and currently he is the President (2022-2024). Rodrigo has been an Effective Partner of the Brazilian Association and Non-Destructive Testing and Inspection (Abendi) from 2010 to 2015.

He has been working on standardization since 1997, elaborating more than 35 national and 40 international technical standards. He worked as the Coordinator of the Committee on Metrology Studies in Equipment for Non-Destructive Testing of the Brazilian Association of Technique Standards (ABNT CE-53: 000.03) from 2010 to 2018. Rodrigo has been the convenor of IEC SCT62D JWG38 (Ultrasound Therapeutic Equipment) since 2022 and an expert in many working groups in IEC TC87 (Ultrasound) since 2010.

He is a member of the Assessing Committee for Technological Development (CA-DT) of the Brazilian National Council for Scientific and Technological Development (CNPq) (2021-2024). He has been a Scientific Advisory Committee member of a private Brazilian company (GM Metrologia) since January 2024. He has been a member of the Technical Consultive Committee of a private Brazilian Company (SENAI-ISI-SIM) since February 2024.

Rodrigo has experience in Mechanical Engineering, Biomedical Engineering, Metrology, and Ultrasound. Rodrigo has authored or co-authored more than 95 papers in peer-reviewed journals and 110 papers in conferences. He is the inventor of three granted patents and one pending patent.

Rodrigo Costa-Felix worked as the Professional Development Coordinator (PDC) at Interamerican Metrology System (SIM) for two consecutive terms (2017-2019; 2020-2023).

2024 IEEE LAUS Short Course Instructors

Tuesday, May 7 (Pre-Conference at the Faculty of Sciences (UDELAR)
9:00 AM – 5:00 PM

Koen van Dongen

Delft University of Technology, Department of Imaging Physics, Faculty of Applied Sciences

Physics of Waves – Modelling and Imaging with Ultrasound

Koen W.A. van Dongen received his M.Sc. degree in Physics at Utrecht University (1997). After that, he worked with T&A Survey in Amsterdam on the design of a directional borehole radar. This research resulted in the Wall Street Journal Innovation Award (2001) as well as a Ph.D. degree from Delft University of Technology (2002). Next, he worked as a postdoc at the same university on ground penetrating radar. In 2003, he used his Marie-Curie Intra-European fellowship to work on non-invasive thermometry using ultrasound at University College Cork, Ireland. In 2006, he returned to Delft to work on modelling and inversion of acoustic and elastic waves for medical, non-destructive testing and seismic applications. In 2023, he has been awarded the IEEE UFFC outreach ambassadorship.

Wednesday, May 8 (Montevideo City Hall)
9:00 AM – 1:00 PM

Ruud van Sloun

Eindhoven University of Technology Biomedical Diagnostics Lab

Deep Learning for Ultrasound Imaging

Ruud JG van Sloun (Member, IEEE) is an Associate Professor at the Department of Electrical Engineering at the Eindhoven University of Technology. He received the M.Sc. and Ph.D. degree (both cum laude) in Electrical Engineering from the Eindhoven University of Technology, Eindhoven, The Netherlands, in 2014, and 2018, respectively. From 2019-2020 he was a Visiting Professor with the Department of Mathematics and Computer Science at the Weizmann Institute of Science, Rehovot, Israel, and since 2020 he is a kickstart AI fellow at Philips Research. He received an ERC starting grant, an NWO VIDI grant, an NWO Rubicon grant, and a Google Faculty Research Award. His current research interests include closed-loop image formation, deep learning for signal processing and imaging, active signal acquisition, model-based deep learning, compressed sensing, ultrasound imaging, and probabilistic signal and image reconstruction.

Wednesday, May 8 (Montevideo City Hall)
9:00 AM – 1:00 PM

Michael L. Oelze

Beckman Institute for Advanced Science and Technology University of Illinois Urbana-Champaign, USA

Quantitative Ultrasound Techniques: The Current State of the Art

Michael L. Oelze (Senior Member, IEEE) was born in Hamilton, New Zealand, in 1971. He received the B.S. degree in physics and mathematics from Harding University, Searcy, AR, USA, in 1994, and the Ph.D. degree in physics from the University of Mississippi, Oxford, MS, USA. From 2000 to 2002, he was a Postdoctoral Researcher with the Bioacoustics Research Laboratory, Department of Electrical and Computer Engineering, University of Illinois at Urbana– Champaign, Urbana, IL, USA. From 2002 to 2004, he was an NIH Fellow conducting research in quantitative ultrasound techniques for biomedical ultrasound applications in cancer detection. In 2005, he joined the Faculty of ECE, UIUC. He is currently a Professor and the Associate Head of Graduate Affairs in ECE, a Health Innovator Professor with the Carle Illinois College of Medicine and the Frederick G. and Elizabeth H. Nearing Scholar, Grainger College of Engineering. His research interests include biomedical ultrasound, quantitative ultrasound imaging for improving cancer diagnostics and monitoring therapy response, ultrasound tomography, ultrasound-based therapy, beamforming, coded excitation, communications using ultrasound, in body devices, and hardware solutions. Dr. Oelze is currently a Fellow of the AIUM, and a Member of ASA. He is a Member of the Technical Program Committee of the IEEE Ultrasonics Symposium. He is currently an Associate Editor for IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Ultrasonic Imaging, and IEEE Transactions on Biomedical Engineering.

Andres Coila

Department of Engineering Medical Imaging Laboratory Pontificia Universidad Católica del Peru, Peru

Quantitative Ultrasound Techniques: The Current State of the Art

Andres Coila is a full-time Research Professor at the Department of Engineering at the Pontificia Universidad Católica del Perú (PUCP). He received the B.Sc. in Electronic Engineering and M.Sc. in Digital Image and Signal Processing from the PUCP in 2008 and 2017, respectively, and the Ph.D. in Electrical and Computer Engineering from the University of Illinois Urbana-Champaign in 2022. In 2023, he won a Postdoctoral researcher grant from the National Program for Scientific Research and Advanced Studies (PROCIENCIA-Peru) to continue the research on the estimation of the acoustic nonlinearity paremeter for soft tissues with techniques developed during his doctoral studies. Current interests of Dr. Coila include improving the robustness of quantitative ultrasound imaging techniques and the joint estimation of quantitative ultrasound properties of soft tissues such as the attenuation coefficient (AC), backscatter coefficient (BSC), and nonlinearity parameter (B/A).

2024 IEEE LAUS Women in Engineering

Friday, May 10
10:30 AM – 11:30 AM

Gianella Facchin Muñoz

Área Química Inorgánica (DEC), Facultad de Química Universidad de la República (Udelar), Uruguay

How can we Keep Talented Women in Academia?

Dra. Gianella Facchin Muñoz is Pharmaceutical Chemist and Doctor in Chemistry at Facultad de Química (Udelar, Uruguay), where she is currently Associate Professor of Inorganic Chemistry. Gianella´s research work is devoted the synthesis and characterization of metal complexes with antitumor activity. At the Program for the Development of Basic Sciences (PEDECIBA, Uruguay) she is the representant of the researchers at the directive board and coordinates the Gender committee. She was the former president of the Uruguayan Society of Biosciences (SUB, 2020-2024).

2024 LAUS Student Pitch Competition

Thursday, May 9
1:30pm - 2:30pm (before poster sessions)

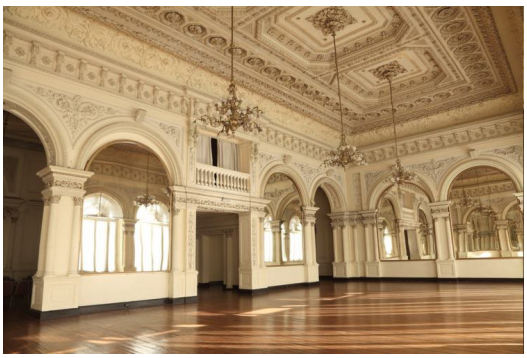
Rules:

- Participants will present their research between one - two minutes with the support of one Powerpoint slide.
- Two winners will be chosen by a committee
- One winner will be chosen by popular vote among the entire student body.
- Presentations should all be in English and will be in-person only
- Campaigning in the days leading up to the competition is allowed

2024 LAUS Conference Dinner

Thursday, May 9
7:30 PM - 12:00 AM

LAUS 2024 welcomes you to join us for a conference dinner at Club Uruguay in the Empire Room.



Empire Room:

The Empire Room, majestic for its ornamentation, delicate colors, magnificent mirrors that surround its walls, transports us to the palace spirit, having a capacity of up to 350 people.

2024 IEEE LAUS Student Paper Competition

Thursday, May 9
11:40 am – 1:10 pm (GMT-3)

Session 1

11:40 – An elastography-Driven Biomechanical Model for Individual Muscle Force Estimation
Gustavo Grinspan

11:57 – Theranostic Potential of Superparamagnetic Iron Oxide nanoparticles
Ariane Franson Sanches

12:14 – Microbubble Position Compensation-Based Motion Correction for Ultrasound Localization Microscopy of Spinal Cord
Junjin Yu

12:31 – Enhanced Denoising of Ultrasonic Attenuation Images Through Robust Weighted Joint Reconstruction
Edmundo Miranda

12:48 – Shear Wave Elasticity Imaging on the Assessment of Skin Damage post-Subcutaneous Implantation
Samuel Morais

Session 2

11:40 – Tracking the Battery State of Charge in Variable C-Rate Operating Ranges Using Quantitative Ultrasound Spectroscopy
Simon Montoya-Bedoya

11:57 – Ultrasonic Guided Wave Unidirectionality Enhancement by Unidirectional Generation and Unidirectional Reception with Electromagnetic Acoustic Transducers
Lucas Martinho

12:14 – Immunoglutination Diagnosis with Acoustofluidic Technology
Ana Beatriz Rodrigues Ferreira

12:31 – Development of an Ultrasonic Power System for Ultrasonic Surgeries
Mateus Silva Costa

2024 IEEE LAUS Technical Program – Wednesday May 8

8:30 AM – 5:00 PM
Registration
Room: Foyer

2:30 PM – 3:00 PM
Opening Ceremony
Room: Salón Azul

3:00 PM – 4:00 PM
Plenary Talk: Designing Ultrasound Systems for Brain Research Across Different Spatial Scales
Room: Salón Azul
Mark Schafer

4:00 PM – 4:10 PM
Verasonics Presentation
Room: Salón Azul

4:10 PM – 4:30 PM
Coffee Break
Room: Foyer

4:30 PM – 6:00 PM
Elastography: Muscle & Cardiac Tissues
Room: Salón Rojo
Session Chair(s): Luiz Vasconcelos

4:30:00 PM
Invited Speaker
9133: Biomechanical Parameters for in Vivo Muscle Characterization
Jean-Luc Gennisson
Université Paris Saclay - CNRS, France

5:00:00 PM
9031: Depth Dependence of Strength in Elbow Flexor Muscles
Nicolas Benech{3}, Gustavo Grinspan{2}, Maria Clara Albuquerque Brandao{1}, Liliam Fernandez de Oliveira{1}
{1}Biomechanics Lab, UFRJ, Brazil; {2}Biophysics department, Science Faculty, Uruguay; {3}Physics Institute, Science Faculty, Uruguay

5:15:00 PM
9055: Comparison of Elasticity Measurements in Lower Limb Muscles Using SSI and Surface Waves
Gustavo Grinspan{2}, Vera de Mora{1}, Maria Clara Albuquerque Brandao{5}, Agustin Arruti{1}, Mariela Garau{3}, Javier Brum{4}, Nicolas Benech{4}
{1}Departamento Clinico de Imagenología, Hospital de Clínicas, Uruguay; {2}Departamento de Biofísica, Facultad de Ciencias, UdelaR, Uruguay; {3}Departamento de Métodos Cuantitativos - Facultad de Medicina, UdelaR, Uruguay; {4}Instituto de Física, Facultad de Ciencias, UdelaR, Uruguay; {5}Laboratorio de Biomecanica, PEB, UFRJ, Brazil

5:30:00 PM
9085: On Possibility of catheter-Based Intracardiac Transient elastography Using Miniature Actuator
Samuel Morais{2}, Andrei Karpiouk{2}, Donald Vanderlaan{2}, Muralidhar Padala{1}, Stanislav Emelianov{3}
{1}Emory University School of Medicine and Georgia Institute of Technology, United States; {2}Georgia Institute of Technology, United States; {3}Georgia Institute of Technology and Emory University School of Medicine, United States

5:45:00 PM
9057: Shear Wave Attenuation Measurement in Transversely Isotropic Tissue
Andres Camargo{1}, Eliana Budelli{2}, Jean-Luc Gennisson{3}, Thomas Frappart{4}, Nicolas Benech{1}, Carlos Negreira{1}, Javier Brum{1}
{1}Intituto de Física, Facultad de Ciencias, UdelaR, Uruguay; {2}Intituto de Química, Facultad de Ingeniería, UdelaR, Uruguay; {3}Laboratoire d'imaginerie Medical Multimodal, BioMaps, Univesrsite Paris Saclay, France; {4}Supersonic Imaging, Aix en Province, France

4:30 PM – 6:00 PM
NDE of Solid Media
Room: Salón Dorado
Session Chair(s): Nicolas Pérez

4:30:00 PM
9027: State of Health Assessment in lithium-Ion Batteries During Accelerated Degradation Using Quantitative Ultrasound Spectroscopy
Simon Montoya-Bedoya{3}, Daniel Rohrbach{4}, Hader V. Martinez-Tejada{2}, Esteban Garcia-Tamayo{1}, Miguel Bernal{5}
{1}BATx SAS, Colombia; {2}Universidad Pontificia Bolivariana, Colombia; {3}Universidad Pontificia Bolivariana, Verasonics SAS, Colombia; {4}Verasonic Inc., United States; {5}Verasonics Inc., United States

4:45:00 PM
9106: Use of the Laser-Induced Ultrasound Time-of-Flight to Size Subsuperficial Microcracks in Metals
Orlando Miguel Medina-Cázares{2}, Melissa Rojas-Romero{1}, Francisco Javier García-Rodríguez{1}, Rigoberto Castro-Beltrán{2}, Arturo González-Vega{2}, Gerardo Gutiérrez-Juárez{2}
{1}Tecnológico Nacional de México en Celaya, Mexico; {2}Universidad de Guanajuato, Mexico

5:00:00 PM
9044: Torsional Wave Mode in Concrete Bars for Nonlinear Characterization
Thomas Gallot{1}, Ignacio Acher{2}, Agustin Spalvier{2}
{1}Facultad de Ciencias - Universidad de la República, Uruguay; {2}Facultad de Ingeniería - Universidad de la República, Uruguay

5:15:00 PM
9042: Ultrasonic Stress Monitoring of Concrete materials: About the Influence of Temperature
Agustin Spalvier, Nicolás Pérez
Facultad de Ingenieria - Universidad de la Republica, Uruguay

5:30:00 PM
9064: Ultrasonic Measurement of acoustoelastic Constants of polymethylmethacrylate (PMMA)
Sílvio Vieira, Ana Cláudia Rezende
Federal University of Goiás, Brazil

6:00 PM – 7:00 PM
UFFC President's Reception (Invite Only)
Room: Foyer/Salón Dorado

8:30 AM – 4:00 PM
Registration
Room: Foyer

8:30 AM – 10:00 AM
Ultrasonic Tissue Characterization I
Room: Salón Rojo
Session Chair(s): Jean Gabriel Minonzio

8:30:00 AM
9047: Ultrafast Doppler Combined with Confocal Microscopy and Behavioral Approaches to Study Central Alterations in Charcot Marie Tooth
Mariana Martínez Barreiro, Lucia Vázquez Alberdi, Lucila De León, Guadalupe Avellanal, Andrea Duarte, Maximiliano Anzibar Fialho, Jérôme Baranger, Miguel Calero, Nicolás Rubido, Mickael Tanter, Carlos Negreira, Javier Brum, Juan Pablo Damián and Alejandra Kun.
{1}Departamento de Biociencias Veterinarias, Facultad de Veterinaria, Universidad de la República, Uruguay; {2}Institute for Complex Systems and Mathematical Biology, University of Aberdeen, King's College, Aber, United Kingdom; {3}Instituto de Física, Facultad de Ciencias, Universidad de la República, Uruguay; {4}Instituto de Fisica, Facultad de Ciencias, Unniversidad de la República, Uruguay; {5}instituto de Salud Carlos III, Spain; {6}Lab. Biología Celular del SNP, Instituto de Investigaciones Biológicas Clemente Estable, Uruguay; {7}LBCSNP-IIBCE y Bioquímica, Facultad de Ciencias, UDELAR, Uruguay; {8}Physics for Medicine, France

8:45:00 AM
9082: Use of Endoluminal and Transabdominal Ultrassound Biomicroscopy to Measure Colon Wall Thickness in Healthy and Tumor-Bearing Mice
Juliana Fernandes, Rodrigo De Oliveira, João Machado
UFRJ, Brazil

9:00:00 AM
9084: Simultaneous Estimation of the Nonlinearity Parameter and the Attenuation Coefficient
Andres Coila, Roberto Lavarello
Pontificia Universidad Católica del Perú, Peru

9:15:00 AM
9100: Ultrafast Doppler Ultrasound for Assessing Blood Perfusion in the foot: a Feasibility Study in Healthy Volunteers
Hari S Nair, Karla Mercado-Shekhar
IIT Gandhinagar, India

9:30:00 AM
9107: Improving Reflection Mode Ultrasound Computed Tomography Using Diverging Waves
Gaofei Jin{1}, Yan Yan{2}, Mohammad Mehrmohammadi{2}
{1}University of Rochester, United States; {2}University of Rochester Medical Center, United States

9:45:00 AM
9129: Multiphysics Inversion of Acoustic and Electromagnetic Wave Fields
Koen van Dongen{1}, Anne de Wit{1}, Ana Ramirez{2}
{1}Delft University of Technology, Netherlands; {2}Industrial University of Santander, Colombia

8:30 AM – 10:00 AM
Acoustofluidics, Microacoustics
Room: Salón Dorado
Session Chair(s): Henrique Andrade

8:30:00 AM
Invited Speaker
9076: Simulation of the Acoustic Radiation Force on a Small Rigid Sphere Generated by an Array of 40 Khz Transducers
Marco Aurelio Brizzotti Andrade
University of São Paulo, Institute of Physics, Brazil

9:00:00 AM
9095: Acoustic Modes with Spin Angular Momentum in Cylindrical Resonators
Alisson Marques, Glauber Silva
Universidade Federal de Alagoas, Brazil

9:15:00 AM
9036: Dual-Mode UltraSound-guided, High-Intensity Focused Ultrasound (USgHIFU) Probe Built Using CMUT Technology for Targeted endocavitary Focal Therapies
Ivan Suarez-Castellanos{2}, Antoine Bienassis{2}, Guillaume Vanstaevel{2}, Bruno Giammarinaro{2}, Thomas Payen{2}, Jean-Yves Chapelon{2}, Nicolas Senegond{3}, Nicolas Guillen{1}, William Apoutou N'Djin{2}
{1}EDAP TMS, France; {2}LabTAU - INSERM U1032, France; {3}VERMON, France

9:30:00 AM
9099: Acoustic Trapping in Cylindrical Resonators with Radial Holograms
Alisson Marques, Glauber Silva
Universidade Federal de Alagoas, Brazil

9:45:00 AM
9010: Bubble-Induced Shear Wave in a Single Cell
Gabrielle Laloy-Borgna, Sibylle Grégoire, Claude Inserra, Stefan Catheline
INSERM, France

10:00 AM – 10:30 AM
Coffee Break
Room: Foyer

10:30 AM – 11:30 AM
Plenary Talk: From Ultrasound Time-Reversal Mirrors to Matrix Imaging
Room: Salón Azul
Mathias Fink

11:40 AM – 1:10 PM
Student Paper Competition (Group 1)
Room: Salón Rojo
Session Chair(s): Ana Ramirez

11:40:00 AM
9034: An elastography-Driven Biomechanical Model for Individual Muscle Force Estimation
Gustavo Grinspan{1}, Liliam Fernandes de Oliveira{2}, Maria Clara Brandão{2}, Nicolás Benech{1}
{1}Facultad de Ciencias, Universidad de la República, Uruguay; {2}Programa de Engenharia Biomédica, Universidad Federal do Rio de Janeiro, Brazil

11:57:00 AM
9039: Theranostic Potential of Superparamagnetic Iron Oxide nanoparticles
Ariane Franson Sanches, Natália Mariana Dos Santos, João Henrique Uliana, Theo Zeferino Pavan, Laudemir Carlos Varanda, Antonio Adilton Oliveira Carneiro
University of Sao Paulo, Brazil

12:14:00 PM
9090: Microbubble Position Compensation-Based Motion Correction for Ultrasound Localization Microscopy of Spinal Cord
Junjin Yu, Yang Cai, Qiwen Hu, Kailiang Xu, Dean Ta
Department of Biomedical Engineering, Fudan University, China

12:31:00 PM
9110: Enhanced Denoising of Ultrasonic Attenuation Images Through Robust Weighted Joint Reconstruction
Edmundo Miranda{1}, Jose Timana{1}, Adrian Basarab{2}, Roberto Lavarello{1}
{1}Pontificia Universidad Católica del Perú, Peru; {2}Université Claude Bernard Lyon 1, France

12:48:00 PM
9112: Shear Wave Elasticity Imaging on the Assessment of Skin Damage post-Subcutaneous Implantation
Samuel Morais{1}, Xinyue Huang{1}, Anthony Yu{1}, Jeong Hun Park{1}, David Zopf{3}, Scott Hollister{2}, Stanislav Emelianov{2}
{1}Georgia Institute of Technology, United States; {2}Georgia Institute of Technology and Emory University School of Medicine, United States; {3}University of Michigan, United States

11:40 AM – 1:10 PM
Student Paper Competition (Group 2)
Room: Salón Dorado
Session Chair(s): Adilton Carneiro, Stefan Catheline

11:40:00 AM
9026: Tracking the Battery State of Charge in Variable C-Rate Operating Ranges Using Quantitative Ultrasound Spectroscopy
Simon Montoya-Bedoya{3}, Daniel Rohrbach{4}, Hader V. Martinez-Tejada{2}, Esteban Garcia-Tamayo{1}, Miguel Bernal{5}
{1}BATx SAS, Colombia; {2}Universidad Pontificia Bolivariana, Colombia; {3}Universidad Pontificia Bolivariana, Verasonics SAS, Colombia; {4}Verasonic Inc., United States; {5}Verasonics Inc., United States

11:57:00 AM
9069: Ultrasonic Guided Wave Unidirectionality Enhancement by Unidirectional Generation and Unidirectional Reception with Electromagnetic Acoustic Transducers
Lucas Martinho{1}, João Pedro T. Andrade{1}, Lei Kang{2}, Steve Dixon{3}, Alan Kubrusly{1}
{1}Pontifical Catholic University of Rio de Janeiro, Brazil; {2}University of Portsmouth, United Kingdom; {3}University of Warwick, United Kingdom

12:14:00 PM
9104: Immunoglutination Diagnosis with Acoustofluidic Technology
Ana Beatriz Rodrigues Ferreira, Glauber Jose Ferreira Tomaz Da Silva, Giclênio C. Silva
Universidade Federal de Alagoas, Brazil

12:31:00 PM
9113: Development of an Ultrasonic Power System for Ultrasonic Surgeries
Mateus Silva Costa, José Pereira Neto Leão, José Henrique Araújo Lopes de Andrade
federal university of alagoas, Brazil

1:10 PM – 2:30 PM
Student Pitch Competition / Lunch
Room: Salón Dorado
Judges: Ivan Suarez Castellanos, Sara Aristizabal, Amauri Assef

2:30 PM – 4:00 PM
Poster Session: Ultrasonic Imaging & Image Analysis Session
Session Code: B3P-C
Room: Foyer
Session Chair(s): Gabriel Montaldo

9032: Exploring the Impact on Collapse and Ultrasound Backscattered Signal Intensity with Varying Ultrasound Power Incident on Gas Vesicle Used for Contrast Agent
Mariana Da Silva, Flávia de Jesus, Felipe Garrute, João Machado
Federal University of Rio de Janeiro, Brazil

9037: Multi-Environment Variational Autoencoder for Robust Optoacoustic Tomography
Alan Dreszman, Matias Vera, Martín Germán González, Leonardo Javier Rey Vega
Facultad de Ingeniería - Universidad de Buenos Aires and CSC-CONICET, Argentina

9038: Ultrasound Images Segmentation for the Breast Nodule Detection
Wadson Araujo Souza, Susana Marrero Iglesias, Paulo Eduardo Ambrosio
Universidade Estadual de Santa Cruz, Brazil

9043: Suppression of Side Lobe Using Spectral Weights of Channel Data in Medical Ultrasonic Imaging
Yu Rim Lee, Mok Kun Jeong
Daejin University, Korea

9058: Design of a Synthetic Breast Ultrasound Image Database
Juan Carlos Solano, Sergio Abreo, Ana Ramirez
universidad industrial de santander, Colombia

9062: Set-Up of an Ultrasound Localization Microscopy Experiment in Latin America
Gonzalo Garay{1}, Mariana Martínez{2}, César Pino{2}, Lucía Vázquez{2}, Mikael Tanter{3}, Alejandra Kun{2}, Javier Brum{1}, Carlos Negreira{1}
{1}Facultad de Ciencias, UdelaR, Uruguay; {2}Instituto de Investigaciones Biológicas Clemente Estable, Uruguay; {3}Physics for Medicine Paris, France

9080: Advanced Computational Modeling of Longitudinal Ultrasonic Wave Propagation in Multilayered Media for Improved Medical Imaging
Mounir Tafkirte, Adil Hamine, Hicham Mesbah, Mohamed Ettahiri
Laboratory of Metrology and Information Processing, Faculty of Science, Ibn Zohr University, Morocco

9103: Ultrasound Signal Processing Using Compounding Plane Waves and Wavelet Analysis
Gilson Maekawa Kanashiro{2}, Rubem Petry Carbente{2}, Amauri Amorim Assef{2}, Joaquim Miguel Maia{2}, Eduardo Tavares Costa{1}
{1}UNICAMP, Brazil; {2}UTFPR, Brazil

9117: Super-Resolution Us imaging: from Optimized Parameters in a Simulation to an Experimental Study in a Human Placenta
Aline Xavier{1}, María Jesús Corral{1}, Bernardo Krause{2}, David Espíndola{2}
{1}Universidad de Santiago de Chile, Chile; {2}Universisdad de Ohiggins, Chile

2:30 PM – 4:00 PM
Poster Session: Ultrasonic Therapy & Biological Effects I Session
Session Code: B3P-D
Room: Foyer
Session Chair(s): Ivan Nenadic

9024: Measurement of Ultrasound Field and an Study of Coupling Medium for Sonodynamic Therapy
Iago Carvalho, Vanderlei Bagnato, Sebastião Pratavieira
USP, Brazil

9075: A computer-Controlled FPGA-Based pulser/Receiver System for Ultrasound Instrumentation
Amauri Amorin Assef{2}, Ednilson de Souza Contieri{2}, Michel Andrey F. De Souza Kohler{2}, Gilson Maekawa Kanashiro{1}, Joaquim Miguel Maia{2}, Eduardo Tavares Costa{3}
{1}Federal Institute of Education, Science and Technology of Paraná (IFPR), Brazil; {2}Federal University of Technology - Paraná (UTFPR), Brazil; {3}University of Campinas (UNICAMP), Brazil

9092: In vitro Effect of the Association of Ultrasound with Croton lechleri on the Inhibition of Candida Albicans
Jaine Rocha{1}, Romaína Araújo{1}, Marcio Romualdo{1}, Luís Maggi{1}, Anselmo Rodriguez{1}, Tamyres Silva{1}, Wagner Pereira{2}
{1}UFAC, Brazil; {2}UFRJ, Brazil

9097: Tracking of Thermal Ablation Using Us B-Mode and Elastography
Edgar Taka{2}, Wagner Pereira{2}, Guillermo Cortela{1}
{1}LAU/FCIEN/UDELAR, Uruguay; {2}PEB/COPPE/UFRJ, Brazil

2:30 PM – 4:00 PM
Poster Session: Ultrasonic Tissue Characterization II Session
Session Code: B3P-E
Room: Foyer
Session Chair(s): Jean Gabriel Minonzio

9012: Relationship Between Piezoelectric Signal Generated in Cancellous Bone by Ultrasound Irradiation and Transmitted Ultrasound Signal
Atsushi Hosokawa
National Institute of Technology, Akashi College, Japan

9048: Fragility Fracture Classification Using Axial Transmission Raw Signals and Multi-Channel Convolutional Neural Network
Daniel Díaz, Williams Flores, Ana Aguilera, Rodrigo Olivares, Roberto Muñoz, Jean-Gabriel Minonzio
Universidad de Valparaíso, Chile

9065: Flexural Pulse Wave Velocity in Blood Vessels
Sibylle Gregoire{2}, Gabrielle Laloy-Borgna{4}, Johannes Aichele{1}, Fabrice Lemoult{3}, Stefan Catheline{2}
{1}ETH Zurick, Switzerland; {2}LabTau, France; {3}Langevin Institut, France; {4}TUDelft, Netherlands

9066: Thermoacoustic Analysis of Cortical Bone Phantom by Critically Refracted Longitudinal Ultrasonic Waves
Alessandro Ramos, Ana Clara Teofilo, Caroline Duderstadt, Juracy Dos Santos, Silvio Vieira
Federal University of Goiás, Brazil

9087: Tailored Convolutional Neural Network Applied to Fragility Fracture Classification Using Ultrasonic Guided Wave Spectrum Images
Williams Flores, Daniel Diaz, Ana Aguilera, Rodrigo Olivares, Roberto Muñoz, Jean-Gabriel Minonzio
Universidad de Valparaíso, Chile

9096: Evaluating the Importance of Geometry in Vascular wave-Based elastography
Matthew Urban{1}, Charles Capron{1}, Murthy Guddati{2}
{1}Mayo Clinic, United States; {2}North Carolina State University, United States

9105: Evaluation of an Open-Source Full-Waveform Inversion Ultrasound Computed Tomography on Simulated Clinical Transducers
Lucas Murilo Da Costa, João Henrique Uliana, Théo Zeferino Pavan, Antonio Adilton Oliveira Carneiro
Universidade de São Paulo, Brazil

9114: Viscoelastic Characterization of copolymer-in-Oil tissue-Mimicking Phantoms for Shear Wave elastography
Mariah Eugênia Cosso Da Silva Prado{3}, João Henrique Uliana{3}, Matthew Urban{1}, Javier Brum{2}, Antonio Adilton Oliveira Carneiro{3}, Theo Zeferino Pavan{3}
{1}Mayo Clinic College of Medicine, United States; {2}Universidad de la República, Uruguay; {3}Universidade de São Paulo, Brazil

9124: Assessing Robustness of the Nonlinearity Parameter Estimation in the Depletion Method to Uncertainty Measurements of Acoustic Variables
Adriana Romero, Roberto Lavarello, Andres Coila
Pontificia Universidad Católica del Perú, Peru

2:30 PM – 4:00 PM
Poster Session: Transducers, Sensors & Actuators I Session
Session Code: B3P-F
Room: Foyer
Session Chair(s): David Collazos-Burbano

9115: Design, Fabrication and Directivity Characterization of Needle-Like Ultrasound Sensors
Orlando Medina-Cázares{1}, Jonathan Álvarez-Martínez{1}, Luis Polo-Parada{2}, Francisco Cortelazzi{2}, Rigoberto Castro-Beltrán{1}, Gerardo Gutiérrez-Juárez{1}
{1}Universidad de Guanajuato Campus León, Mexico; {2}University of Missouri Columbia, United States

9101: Comparison of the L-Network and Simplified network's Impedance Matching of Electromagnetic Acoustic Transducers
João Pedro T. Andrade{1}, Pedro Leon F. C. Bazan{1}, Lucas Martinho{1}, Vivian S. Medeiros{2}, Alan C. Kubrusly{1}
{1}PUC-Rio, Brazil; {2}USP, Brazil

2:30 PM – 4:00 PM
Poster Session: NDE & Physical Acoustics Session
Session Code: B3P-G
Room: Foyer
Session Chair(s): Gerardo Gutierrez-Juarez

9025: Seismic Behavior Study of Steel Structure Retrofitted with Linear and Nonlinear Dampers
Adil Ziraoui{1}, Benaissa Kissi{1}, Hassan Aaya{2}
{1}Ensam, Morocco; {2}UIC, Morocco

9045: Wave Propagation in a Soft Granular Media with Gradient Elasticity
Valeria Abraham, Thomas Gallot, Gonzalo Tancredi
Instituto de Física, Facultad de Ciencias, Universidad de la República, Uruguay

9046: SPH Method for Wave Propagation in Granular Media
Mauro Picó, Thomas Gallot, Gonzalo Tancredi
Astronomy, Physics Institute, Science Faculty, University of the Republic, Uruguay

9061: Characterization of a Single Channel Programmable Microcontroller Ultrasonic Pulser Receiver System
Ryver Franco, Jeveson Silva, Sílvio Vieira
Federal University of Goiás, Brazil

9073: Ultrasonic Speed Measurements for Polylactic Acid (PLA) Characterization
Vicente Gajardo{1}, Julián Corach{2}, Tobías Loni{1}, Ligia Ciocci Brazzano{2}, Patricio Sorichetti{1}, Martín González{2}, Eduardo Acosta{1}
{1}Universidad de Buenos Aires, Argentina; {2}Universidad de Buenos Aires/CONICET, Argentina

9088: Ultrasonic raytracing Simulation Method for Data Augmentation to Surveil the Bathroom with Digital Twins
M. Shahrul Amir Kamarulzaman, Riku Hamabe, Ryotaro Ohara, Shun Sato, Shintaro Izumi, Hiroshi Kawaguchi
Kobe University, Japan

4:00 PM – 4:30 PM
Coffee Break
Room: Foyer

4:30 PM – 6:00 PM
Medical Photoacoustics
Room: Salón Rojo
Session Chair(s): Diego Dumani

4:30:00 PM
Invited Speaker
9130: Synergy and Applications of Ultrasound, Photoacoustic and Elasticity Imaging
Stanislav Emelianov
Georgia Institute of Technology, United States

5:00:00 PM
9040: Monitoring Thermal Ablation Through Combined Photoacoustic Imaging and Magnetomotive Ultrasound in Magnetic Nanoparticle Hyperthermia
Jose Eduardo Freire, Joao Henrique Uliana, Nicholas Zufelato, David Alejandro Collazos Burbano, Antonio Adilton Oliveira Carneiro, Theo Zeferino Pavan
Universidade de São Paulo, Brazil

5:15:00 PM
9079: A Wide Field of Vision Photoacoustic Imaging Method Based on Axial-Lateral Multi-Angle Laser Excitation and Coherent Compounding Technique: a Simulation and Experiment Study
Boyi Li, Shuai Han, Qiang Xie, Chunshan Yang, Tianhua Zhou, Ying Li, Ting Feng, Dan Li, Kailiang Xu, Xin Liu, Dean Ta
Fudan University, China

5:30:00 PM
9108: Background-Free Detection of Light-activatable Perfluorocarbon Nanodroplets
Meybelle Castro Valverde, Alejandro Ulate Arce, Diego Dumani
University of Costa Rica, Costa Rica

5:45:00 PM
9131: Quantitative Evaluation of Murine Cervical Remodeling During Pregnancy and Post-partum Repair Using Ultrasound, Photoacoustic, and Elasticity Biomarkers
Yan Yan{3}, Jose Galaz{5}, Joshua Marvald{3}, Tanzy Love{2}, Steven Yellon{1}, Nardhy Gomez-Lopez{4}, Mohammad Mehrmohammadi{3}
{1}Loma Linda University, United States; {2}University of Rochester, United States; {3}University of Rochester Medical Center, United States; {4}Washington University School of Medicine, United States; {5}Wayne State University, United States

4:30 PM – 6:00 PM
NDE of Liquid Media & Industrial Applications
Room: Salón Dorado
Session Chair(s): Thomas Gallot

4:30:00 PM
9051: Experimental Study of Liquid Level Detection Using Acoustic Wave Transmission in Confined Spaces
Naser Tanabi{1}, Agesinaldo Matos Silva Jr{1}, Timóteo Francisco Oliveira{1}, Luiz Octavio Vieira Pereira{2}, Flávio Buiochi{1}, Marcos Sales Guerra Tsuzuki{1}
{1}Escola Politécnica da Universidade de São Paulo, Brazil; {2}Petrobras, Brazil

4:45:00 PM
9052: An FEM Analysis of Ultrasonic Transmission to Detect the Liquid-Liquid Interface in Containers with Regular Shapes
Naser Tanabi{1}, Agesinaldo Matos Silva Jr{1}, Timóteo Francisco Oliveira{1}, Luiz Octavio Vieira Pereira{2}, Flávio Buiochi{1}, Marcos Sales Guerra Tsuzuki{1}
{1}Escola Politécnica da Universidade de São Paulo, Brazil; {2}Petrobras, Brazil

5:00:00 PM
9056: Cleaning of Printed Circuit Heat Exchangers (PCHE) Using High-Power Ultrasonic Transducers
Hossein Nasiri{1}, André César Martins Cavalheiro{1}, Timóteo Francisco Oliveira{1}, Naser Tanabi{1}, Bruno Barbosa Castro{2}, Marcos Sales Guerra Tsuzuki{1}, Flávio Buiochi{1}
{1}Escola Politécnica da Universidade de São Paulo, Brazil; {2}Petrobras, Brazil

5:15:00 PM
9054: Resonance Frequency Tracking and Power Supply Adjusting Control for a High Frequency Ultrasonic Device Used to oil-in-Water Microemulsion (Wastewater) Separation
Carlos Mario Giraldo Atehortua{1}, Agesinaldo Matos Silva Jr{1}, Luiz Octavio Vieira Pereira{2}, Flávio Buiochi{1}, Marcos Sales Guerra Tsuzuki{1}
{1}Escola Politécnica da Universidade de São Paulo, Brazil; {2}Petrobras, Brazil

5:30:00 PM

9014: Investigation of Data Acquisition Procedures on Acoustic experiments: Search for Reliable and Abundant Data

Marcelo Ferreira de Souza Alves{5}, Julio Cesar Eduardo de Souza{2}, Marcelo Moreira Tiago{1}, Ricardo Tokio Higuti{2}, Marco Antonio Gomes Teixeira{4}, Ana Mehl{3}, José Carlos Costa Da Silva Pinto{5}
{1}Departamento de Engenharia Elétrica / UFOP, Brazil; {2}Departamento de Engenharia Elétrica / UNESP, Brazil; {3}Departamento de Engenharia Química / EQ / UFRJ, Brazil; {4}Instituto de Química/GQA/ UFF, Brazil; {5}Programa de Pós-Graduação em Engenharia de Processos Químicos e Bioquímicos (EPQB) / EQ / UFRJ, Brazil

5:45:00 PM

9053: Liquid-Liquid Interface Localization Using Wave Pattern Measured by Ultrasonic Through-Transmission Mode

Agesinaldo Matos Silva Jr{1}, Naser Tanabi{1}, Timóteo Francisco Oliveira{1}, Luiz Octavio Vieira Pereira{2}, Flávio Buiochi{1}, Marcos Sales Guerra Tsuzuki{1}
{1}Escola Politécnica da Universidade de São Paulo, Brazil; {2}Petrobras, Brazil

7:00 PM – 12:00 AM
Conference Dinner
Room: Club Uruguay in the Empire Room

2024 IEEE LAUS Technical Program – Friday May 10

8:30 AM – 1:00 PM
Registration
Room: Foyer

8:30 AM – 10:00 AM
Ultrasonic Imaging: Methods & Devices
Room: Salón Rojo
Session Chair(s): Wagner C A Pereira

8:30:00 AM
9003: Development of Active Radiological Markers Having Ultrasound Identification (USID)
Michael Oelze{3}, April Dickenson{1}, Zhengchang Kou{3}, Christine Lee{2}, Jenna Cario{3}
{1}Carle Foundation Hospital, United States; {2}Mayo Clinic, United States; {3}University of Illinois at Urbana-Champaign, United States

8:45:00 AM
9022: IIWM (Integration ImageJ with MATLAB) Program for Segmentation and Volume Estimation in Ultrasound biomicroscopic Images of Mouse Colon Tumor
Igor Colonna{1}, Yasmin Sant'Anna{2}, Rodrigo Oliveira{1}, João Machado{1}
{1}Federal University of Rio de Janeiro, Brazil; {2}INFNET Institute, Brazil

9:00:00 AM
9089: High-Resolution Ultrasound Imaging in Both Range and Lateral Directions Based on Music Algorithm
Jie Zheng{1}, Jing Zhu{2}, Norio Tagawa{1}
{1}Tokyou Metropolitan University, Japan; {2}Zhejiang Lab, China

9:15:00 AM
9098: Ultrasound Image Segmentation with a Hybrid Model of Spatial and Frequency Domains
Ahmed Al-Qurri, Mohamed Almekkawy
Penn State University, United States

9:30:00 AM
9125: Robustness Assessment of cGAN Ultrasound Beamformer Using Adversarial Perturbations
Itamar Salazar, Roberto Lavarello
Pontificia Universidad Católica del Perú, Peru

9:45:00 AM
9127: Generative Models for Ultrasound Image Reconstruction from Single plane-Wave Simulated Data
Sebastian Merino, Itamar Salazar-Reque, Roberto Lavarello
Pontificia Universidad Católica del Perú, Peru

8:30 AM – 10:00 AM
Physical Acoustics
Room: Salón Dorado
Session Chair(s): Marco Andrade

8:45:00 AM
9074: Experimental Study on the Probability of Inducing and Detecting Cavitation Events in a Soft Solid
Gonzalo Garay, Yamil Abraham, Guillermo Cortela, Nicolás Benech, Carlos Negreira
Facultad de Ciencias, UdelaR, Uruguay

9:00:00 AM
9068: Advances on the Side-Shifted Dual Periodic Permanent Magnet Electromagnetic Acoustic Transducers Design for Unidirectional Generation of Shear Horizontal Ultrasonic Guided Wave
Lucas Martinho{1}, João Pedro T. Andrade{1}, Lei Kang{2}, Steve Dixon{3}, Alan Kubrusly{1}
{1}Pontifical Catholic University of Rio de Janeiro, Brazil; {2}University of Portsmouth, United Kingdom; {3}University of Warwick, United Kingdom

9:15:00 AM
9071: Influence of Thermal Finite Diffusion on the Generation and Propagation of the Laser-Induced Ultrasound for Strong Optical Absorber Materials
Lenin Francisco Escamilla-Herrera{2}, Jose Mario Derramadero-Domínguez{1}, Gerardo Gutiérrez-Júarez{2}, Francisco Javier Garcia-González{1}, Francisco Josafath Muñoz-Barbosa{2}
{1}Instituto Tecnológico de México en Celaya, Mexico; {2}Universidad de Guanajuato, Mexico

10:00 AM – 10:20 AM
Coffee Break
Room: Foyer

10:20 AM – 10:30 AM
Focused Ultrasound Foundation Presentation
Room: Salón Dorado

10:30 AM – 11:30 AM
D&I Session: How can we Keep Talented Women in Academia? (Breakfast Included)
Room: Salón Dorado
Session Chair(s): Aline Xavier

11:40 AM – 1:10 PM
Elastography: Models & Applications
Room: Salón Rojo
Session Chair(s): Benjamín Castañeda

11:40:00 AM
Invited Speaker
9132: Evaluating Vascular Mechanical Properties with Ultrasound and Computational Approaches
Matthew Urban
Mayo Clinic, United States

12:10:00 PM
9033: Assessing the Contractile Dynamics of Synergistic Muscles Through a Molecular Approach and elastography
Gustavo Grinspan{1}, Liliam Fernandes de Oliveira{2}, Maria Clara Brandão{2}, Andrés Pomi{1}, Nicolás Benech{1}
{1}Facultad de Ciencias, Universidad de la República, Uruguay; {2}Programa de Engenharia Biomédica, Universidad Federal do Rio de Janeiro, Brazil

12:25:00 PM
9123: Adaptive Superlet-Based Shear Wave Speed Estimator for Crawling Wave Sonoelastography
Cristina Orihuela, Eduardo Lujan, Sebastian Merino, Benjamín Castaneda, Stefano Romero
Pontificia Universidad Católica del Perú, Peru

12:40:00 PM
9023: Estimating Nonlinear Parameters for Achilles Tendon Assessment Using Timoshenko Beam Model and Supersonic Shearwave Imaging
Maria Clara BrandÃo{2}, Liliam Oliveira{2}, Gustavo Grispan{1}, NicolÁs Benech{1}
{1}UDELAR, Uruguay; {2}UFRJ, Brazil

12:55:00 PM
9134: Post-Transplant Liver Biopsy Classification Using Shear Wave Velocity and Attenuation and Support Vector Machine Techniques
Ivan Nenadic{2}, Luiz Vasconcelos{3}, Sara Aristizabal{1}, Matthew Urban{3}
{1}Delos Labs, United States; {2}Duke Cardiology, United States; {3}Mayo Clinic Radiology, United States

11:40 AM – 1:10 PM
Transducers, Sensors & Actuators II
Room: Salón Dorado
Session Chair(s): Rodrigo Costa-Félix

11:40:00 AM
9020: Numerical and Experimental Demonstration of an Acoustic Waveguide System to Generate superfocused Ultrasonic Beams
Jose Henrique Lopes, Fernanda de Lucena, Israel Bispo Santos, Jose Pereira Leão-Neto
Federal University of Alagoas, Brazil

11:55:00 AM
9078: Improving air-Coupled Resonant Ultrasonic Spectroscopy of Layered structures: Application to Contactless Plant Leaves Characterization
David Collazos-Burbano{2}, Jhon Pazos-Ospina{1}, Joao Ealo{1}
{1}Universidad del Valle, Colombia; {2}University of Sao Paulo, Brazil

12:10:00 PM
9077: Low Cost Indoor Trajectory Measurement Using Ultrasonic Echography in Air
Sebastian Rubio, Tomas Rodenas, Jean-Gabriel Minonzio
Universidad de Valparaiso, Chile

12:25:00 PM
9083: Quantitative Experimental Evaluation of Ultrasonic Oscillating Temperature Sensors
Ali Elyounsi, Alexander Kalashnikov
Sheffield Hallam University, United Kingdom

12:40:00 PM
9086: Design, Construction, and Application of Ultrasonic Cells on Golden Mussel Larvae
Lucas Mendes Santos, José Pereira Leão Neto, José Henrique Lopes
Federal University of Alagoas - Campus Arapiraca, Brazil

1:10 PM – 2:30 PM
Lunch

2:30 PM – 4:00 PM
Ultrasonic Therapy & Biological Effects II
Room: Salón Rojo
Session Chair(s): João Carlos Machado

2:30:00 PM
9004: Simulating Focused Ultrasound with the Boundary Element Method
Elwin van 'T Wout{1}, Reza Haqshenas{2}, Pierre Gélat{2}
{1}Pontificia Universidad Católica de Chile, Chile; {2}University College London, United Kingdom

2:45:00 PM
9011: Influence of Langevin-Type Transducer Tip Design on Ultrasound-Mediated Transdermal Drug Delivery
Gutemberg Silva Cardoso{2}, José Henrique Lopes{1}, Yugo Araújo Martins{2}, Antonio Adilton Carneiro{2}, Renata Fonseca Lopez{2}, Theo Zeferino Pavan{2}
{1}Federal University of Alagoas, Brazil; {2}University of São Paulo, Brazil

3:00:00 PM
9015: Non-Invasive real-Time Tissue Temperature Control Using Change in Backscattered Energy of RF Echo Signal During Ultrasound Hyperthermia
Michael Nguyen{2}, Gholam Peyman{1}, Michael Kolios{2}, Jahangir Tavakkoli{2}
{1}Cancer Rx Inc., United States; {2}Toronto Metropolitan University, Canada

3:15:00 PM
9021: Spatiotemporal Analysis of single-Pulse Focused Ultrasound (FUS)-Evoked Ca2+ Signaling in a Human Neural Progenitor Cell Line
Ivan Suarez-Castellanos{3}, Tom Aubier{3}, Magali Perier{3}, Sandrine Parrot{2}, Alexandre Carpentier{1}, William Apoutou N'Djin{3}
{1}AP-HP, France; {2}Centre de Recherche en Neurosciences de Lyon, France; {3}LabTAU - INSERM U1032, France

3:30:00 PM
9049: Artificial Visual Phantoms for Ultrasound Thermal Therapy
Natalia Garay Badenian{2}, Nicolas Benech{1}, Guillermo Cortela{1}, Franco Simini{2}
{1}Laboratorio de Acústica Ultrasonora, Uruguay; {2}Nucleo de Ingeniería Biomédica, Uruguay

3:45:00 PM
9093: Sonophotodynamic Inactivation of Pseudomonas aeruginosa biofilm Mediated by Curcumin
Iago Carvalho, Vanderlei Bagnato, Sebastião Pratavieira
University of São Paulo, Brazil

2:30 PM – 4:00 PM
Acoustic Measurements for Industrial Applications
Room: Salón Dorado
Session Chair(s): Miguel Bernal

2:30:00 PM
Invited Speaker
9136: Basics of Uncertainty Assessment for Ultrasound Applications: Speed of Sound and Ultrasonic Power
Rodrigo Costa-Felix
Brazilian National Institute of Metrology, Quality, and Technology, Brazil

3:00:00 PM
9120: Ultrasonic Spectroscopy for Characterization of Glycerol and Water Mixtures
Gabrielle Ceola Camargo{2}, Julio Cesar Eduardo de Souza{2}, Marcelo Ferreira de Souza Alves{4}, Marcelo Moreira Tiago{3}, Luis Elvira{1}, Ricardo Tokio Higuti{2}
{1}Conselho Superior de Investigações Científicas, Spain; {2}Universidade Estadual Paulista, Brazil; {3}Universidade Federal de Ouro Preto, Brazil; {4}Universidade Federal do Rio de Janeiro, Brazil

3:15:00 PM
9050: Fluid Cavitation Analysis in Pressurized Vessels Using High-Power Ultrasonic Transducers
Naser Tanabi{1}, André César Martins Cavalheiro{1}, Timóteo Francisco Oliveira{1}, Hossein Nasiri{1}, Bruno Barbosa Castro{2}, Flavio Buiochi{1}, Marcos Sales Guerra Tsuzuki{1}
{1}Escola Politécnica da Universidade de São Paulo, Brazil; {2}Petrobras, Brazil

3:30:00 PM
9121: Finite Element Modeling for Lamb Wave Propagation in Laminar Materials Under Varying Anisotropic Conditions
Mauricio Salas Eraso, David Collazos-Burbano, Jhon Pazos-Ospina, Joao Ealo Cuello
Universidad del Valle, Colombia

3:45:00 PM
9063: Design of an Acoustic Resonance Interferometer for Velocity and Absorption Evaluation of Liquids
Juracy Leandro, Silvio Vieira
Federal University of Goiás, Brazil

4:00 PM – 4:30 PM
Coffee Break
Room: Foyer

4:30 PM – 6:00 PM
Blood Flow & Functional Ultrasound
Room: Salón Rojo
Session Chair(s): Aline Xavier

4:30:00 PM
9002: Contrast-Free Microvessel Imaging Using Null Subtraction Imaging Combined with Harmonic Imaging
Michael Oelze, Zhengchang Kou
University of Illinois at Urbana-Champaign, United States

4:45:00 PM
9005: Using Functional Ultrasound to Study Brain Connectivity and Functional Response in TrJ mice, Model of Charcot-Marie-Tooth Disease
Maximiliano Anzibar{1}, Mariana Martinez{2}, Lucía Vázquez Alberdi{2}, Juan Pablo Damián{4}, Jerome Baranger{3}, Mikael Tanter{3}, Carlos Negreira{4}, Alejandra Kun{2}, Nicolás Rubido{5}, Javier Brum{4}
{1}Institut Pasteur Montevideo, Uruguay; {2}Instituto de Investigaciones Biológicas Clemente Estable, Uruguay; {3}Physics for Medicine, France; {4}Universidad de la República, Uruguay; {5}University of Abardeen, United Kingdom

5:00:00 PM
9009: Twinkling Marker Tracking with Audio Feedback Using Color Doppler Video Stream
Luiz Vasconcelos, Christine Lee, Matthew Urban
Mayo Clinic, United States

5:15:00 PM
9016: Imaging the Electrical Activity of the Brain with Functional Ultrasound
Gabriel Montaldo
NERF VIB, Belgium

5:30:00 PM
9091: Multi-Angle Emission and Cross-Correlation Based Ultrafast Doppler and Functional Ultrasound Imaging
Shaoyuan Yan, Haotian Wu, Kailiang Xu
Fudan University, China

5:45:00 PM
9094: Validation of a low-Cost and high-Performance Hardware Architecture for Functional Ultrasound
Jorge Fernández Cruza{3}, Ricardo González Bueno{1}, Raul Mateos Gil{4}, Gabriel Montaldo{2}, Jorge Camacho{3}
{1}DASEL SL, Spain; {2}Neuroelectronics Research Flanders, Belgium; {3}Spanish National Research Council, Spain; {4}Universidad de Alcalá de Henares, Spain

4:30 PM – 6:00 PM
Harmonic Elastography & Viscoelastic Characterization
Room: Salón Dorado
Session Chair(s): Nicolás Benech

4:30:00 PM
9007: MUSA-WAVE: a Software Platform for Magnetomotive Ultrasound and Shear Wave Analysis
João Henrique Uliana, Diego Thomaz Sampaio, Ariane Franson Sanches, Theo Zeferino Pavan, Antonio Adilton Carneiro
University of São Paulo, Brazil

4:45:00 PM
9008: Kelvin-Voigt Dispersion Curve Correction Using Estimated Group Velocity
Luiz Vasconcelos{2}, Piotr Kijanka{1}, Matthew Urban{2}
{1}AGH University of Science and Technology, Poland; {2}Mayo Clinic, United States

5:00:00 PM
9028: Advancing Magnetomotive Ultrasound: Vector-Valued Displacement Analysis for Comprehensive Tissue Characterization
David Alejandro Collazos-Burbano, Joao Uliana, Ariane Sanches, José Eduardo Freire, Nicholas Zufelato, Adilton O. Carneiro, Theo Z. Pavan
University of Sao Paulo, Brazil

5:15:00 PM
9111: Angular Integration Autocorrelation Approach for Shear Wave Speed Estimation in the Framework of Reverberant Shear Wave Elastography
Hamidreza Asemani, Gilmer Flores barrera, Kevin Parker
University of Rochester, United States

5:30:00 PM
9122: Comparison Between Passive and Reverberant Shear Wave elastography: Preliminary Results
Stefano Romero{1}, Eduardo Luján{1}, Gilmer Flores{1}, Nicolas Benech{2}, Roberto Lavarello{1}, Carlos Negreira{2}, Benjamín Castaneda{1}, Javier Brum{2}
{1}Pontificia Universidad Católica del Perú, Peru; {2}Universidad de la República, Uruguay

5:45:00 PM
9126: Experimental Validation of Crawling Wave sonoelastography Using a high-Performance Ultrasound System – Verasonics Vantage LE64
Eduardo Luján, Sebastian Merino, Andrés Coila, Benjamín Castaneda, Stefano Romero
Pontificia Universidad Católica del Perú, Peru

6:00 PM – 6:30 PM
Closing Cermony
Room: Salón Dorado

Author Index