IEEE

IUS 2021

International Ultrasonics Symposium

Virtual Symposium | September 11 - 16, 2021

September 11-12: Short Courses || September 12-16: Technical Program

IUS 2021 SYMPOSIUM PROGRAM

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Headquartered in Shenzhen China, Mindray is a multinational corporation with subsidiaries in more than 30 countries in North and South America, Europe, Africa, and the Asia-Pacific region. The company's products and services can be found in healthcare facilities in over 190 countries.

Driven by innovation, Mindray has built up a global R&D network with 9 research centers in the US and China. Focused on fully understanding the needs of both patients and practitioners, Mindray's insightful innovation produces ergonomically optimized medical devices that are readily accessible by the healthcare practitioner, allowing doctors and nurses to focus on the patient, not the machine.

Mindray closely controls all aspects of R&D and production, from design through to manufacturing of the final product. An integrated in-house production facility ensures the highest quality and also reduces costs, maximizing value for customers and ultimately making healthcare accessible to more people.

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Verasonics designs and markets leading-edge Vantage™ ultrasound research systems for academic and commercial investigators. These real-time, software-based, programmable ultrasound systems accelerate research by providing unsurpassed speed and control to simplify the data collection and analysis process. Researchers in 34 countries routinely use the unparalleled flexibility of the Vantage platform to advance the art and science of ultrasound through their own research efforts. In addition, to protect your investment and encompass additional research options, every Vantage System can be upgraded to any configuration. Verasonics' Vantage Systems are the ideal solution for ultrasound driven research and development in biomedical, materials science, earth sciences, and the physics of acoustics.

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VINNO, Innovation For A Better Life, is a manufacturing challenger in Color Doppler Ultrasound market, a products and solutions' provider in 100+ countries globally. We are committed to continuously have heavy investment in R&D toimprove outcomes for our customers to meet the evolving challenges around the world. In past 11 years, together with our customers and academic professionals we developed full range of product portfolio and holding nearly 300 invention patents to satisfy various applications in the field.

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Vermon is leading the development and industrialization of state-of-the-art ultrasound solutions for medical and industrial applications.

Vermon’s commitment is to innovate, design and manufacture advanced transducers and arrays with cutting-edge technology to support its customers' innovative ultrasound applications while strengthening their long-term market position with superior ultrasound imaging performances.

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Founded in Zhangjiang Hi-tech Park, Shanghai, Acoustic Life Science Co., Ltd. (ALS) is a high-tech company dedicated to the research, development, manufacture, and application of advanced medical ultrasound technology.

With cutting-edge technology, ALS specializes in high-end medical imaging ultrasound products, including ceramic probes, piezoelectric composite, and single crystal probes.

We are focusing on medical ultrasound probes and exploring more potentials, such as endoscopic ultrasound transducers, intravascular ultrasound imaging catheters, and hand-held ultrasonic probe solution, aiming to innovate and deliver high quality products to the worldwide customers.

We provide technical expertise and engineering support for emerging applications in advanced ultrasound technologies.

Daxsonics offers services to help companies develop ultrasound products. We work in at all stages of the life cycle providing a range of services including R&D, acoustic stack design, transducer design, electronics, software design, firmware design, and system integration. Our team of industry leading experts consistently come up with creative solutions to help develop market-disrupting products.

FUJIFILM VisualSonics, Inc is the undisputed world leader in the development of real-time ultrasound and photoacoustic systems, providing tools specifically designed to support imaging-based research. Our cutting edge technologies support researchers at the world's top pharmaceutical and biotechnology companies, hospitals, and universities in their research efforts across areas including cardiovascular, cancer, neurobiology, developmental biology, and acoustics. These technologies support applications including genetic research, phenotypic studies, drug development, imaging systems development, and many more. VisualSonics' platforms combine a broad range of frequencies, high resolution, real-time data acquisition, and access to quantifiable data, all supported by powerful user-friendly software.

Bronze Patrons

Doppler is a world leading manufacturer to provide high performance nondestructive testing instruments & transducers, dedicate to build a renowned world brand of ultrasound. Doppler was established in 2008, located in Guangzhou, China, certified as National High-tech Enterprise.

The ultrasonic inspection system for detecting the presence, magnitude and position of flaws in materials. Our products are designed to apply for non-destructive testing on materials like pipeline corrosions & weld defects, GIS conductor weld cracks, aerospace composite material defects, railway tracks & wheel defects, steel plate cracks etc.

Doppler launched high standard products with strong technical indexes in market, composite conventional crystal probes and high performance composite phased array probes (including linear array, 2D array, concave, annular sectorial and so on), special high frequency probes and TOFD probes. Doppler independently developed ultrasonic equipment and scanners: portable ultrasonic phased array flaw detector,digital ultrasonic flaw detectors, and a variety of scanners for pipe and plate weld. The great performance of products have reached or surpassed the international advanced level.

Qualified and cost-effective medical ultrasound systems manufacturer.

As an ISO 9001/13485 & CE certified industrial entity and national hi-tech corporation, Ecare Electronics Science & Technology Co., Ltd. has been focusing on R&D and manufacturing of medical ultrasound devices since 2007.

Ecare has a full product line, including handheld, laptop, portable and trolley color doppler ultrasound imaging devices. Some of the products have treatment function integrated.

A strict quality management system is deployed in Ecare to control every process in R&D, manufacturing, inspection and warehousing.

Ecare always sync with the frontier ultrasound imaging researches and try to apply them to products.

The Focused Ultrasound Foundation was created to improve the lives of millions of people worldwide by accelerating the development of this noninvasive technology. The Foundation works to clear the path to global adoption by organizing and funding research, fostering collaboration, and building awareness among patients and professionals. Since its establishment in 2006, the Foundation has become the largest nongovernmental source of funding for focused ultrasound research. For more information, visit http://www.fusfoundation.org.

Bronze Patrons (Continued)

Focus & Fusion Healthcare

Focus & Fusion Healthcare is dedicated in researching, developing and manufacturing innovative and high-quality clinical ultrasound diagnostic equipment. Based on our unique HI® imaging platform, BTM® transducer platform and precisely controlled processing technology, our products demonstrate both high-performance and great reliability. As one of the few manufacturers in this industry who are able to independently provide full-stack solution, i.e. hardware, algorithm, application, transducer, we are capable to provide advanced solutions such as multi-beam forming, full acoustic field focusing, 768 elements premium transducer and so on.

scia systems

scia Systems is a full range supplier of advanced ion beam and plasma processing equipment. The systems are applicable for etching (e.g., delayering of dies), trimming (e.g., surface correction of filter devices) and coating (e.g., temperature compensation films) processes in the production of microelectronics and MEMS.

Our process equipment achieves Angstrom precision in frequency, surface and thickness trimming, in manufacturing of BAW and SAW devices. The industry proven scia Trim 200, enables ion beam trimming of functional layers in compound wafers, which leads to excellent material properties.

Due to their flexible and modular design, the systems can be configured according to customer specific requirements for both, high volume production as well as research and development environments. Together with our worldwide service partners, we offer comprehensive service and superior technology support.

E&I Pure Power

Electronics & Innovation, Ltd is a focused and dynamic company fulfilling the market demand for rugged and reliable RF power amplifiers. Founded in 2003, by former ENI engineers and executives, E&I was incorporated on the 16th of March, 2004. We are located in Rochester, NY, where all products are designed, assembled, and tested at our facility. E&I services and supports all major markets; operating globally through distributor outlets worldwide. E&I is committed to providing RF power amplifier solutions of the highest quality, durability, and ruggedness. Our amplifiers have under gone tests by the military and have proven to be even more reliable than the original ENI amplifiers. In addition unlike the old ENI amplifiers, they are CE marked, RoHS Compliant and meet all relevant emissions and safety standards. The Difference to You E&I has the people, the products, and the capabilities to meet your RF needs. Quality is and has been at the cornerstone of our growth – we constantly strive to be better, so that you can achieve more.

Bronze Patrons (Continued)

us4us®

us4us Ltd. delivers advanced ultrasound research systems and OEM components optimized for software-defined ultrasound applications and GPU processing. Our solutions feature raw RF acquisition and high-speed PCIe data streaming, enabling the end user to implement their own real-time CPU/GPU processing algorithms. An open SDK provides flexibility and easy integration with C/C++/Python/Matlab.

Our current offering:
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- us4R – an advanced 2D/3D-ready ultrasound research system featuring 256TX/256RX channels and an extremely high data transfer rate (up to 30GB/s). The system is intended for real-time implementation of advanced/complex ultrasound processing algorithms on GPUs.
- us4OEM – a credit-card sized ultrasound front-end module with 128TX/32RX channels for integration in the end-user system/solution.

Furthermore, we offer consulting and development services in the area of ultrasound methods, systems, and product development.

SONIC™
CONCEPTS

Sonic Concepts™ is a global leader in designing and delivering innovative therapeutic and focused ultrasound solutions for leading-edge pre-clinical research. In addition to their HIFUPlex™ and NeuroFUS™ systems, the company creates customized ultrasound devices tailored for unique clinical and industrial needs. Sonic Concepts also offers custom R&D engineering, design, and prototyping services, plus scalable manufacturing of specialized ultrasound transducers and systems for a wide variety of therapy and imaging purposes. Every day, researchers and organizations around the world use Sonic Concepts' best-in-class customizable products and turnkey ultrasonic therapy and imaging solutions to make medical breakthroughs and solve complex problems.

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IEEE IUS 2021 Welcome Message

Dear International Ultrasonics Symposium Colleagues,

We would like to warmly welcome you to participate in the 2021 IEEE International Ultrasonics Symposium (IUS) with Xi'an as the originally planned venue for a face-to-face conference. Unfortunately, due to the global pandemic situation, IUS 2021 will be a full-online meeting again this year, since the original plan of in-person meeting in Xi'an and the possible hybrid format have been abandoned.

Based on the recent experiences of on-line IUS and UFFC conferences, both the oral lectures and the poster presentations are pre-recorded and available for on-demand viewing on the conference platform in year. Furthermore, the participants can not only engage with the speakers via the live Q&A during the session on the conference platform, but also discuss or talk with each other within the Gather.Town rooms to facilitate virtual face to face interactions. The well-received group discount for registration is continued again this year to provide additional free registrations within the same organization. This year, a special discount is offered to encourage the participation of the registrants from Low to Middle Income Countries (LMIC).

Under the situation of a severe global pandemic, ultrasonics colleagues are still working so hard and a record number of abstracts was submitted this year. 1,171 papers were selected for lecture and poster presentations after the strict review process of the Technical Program Committee members. During this year's edition, the 2021 Biomedical Engineering Award will be given to Professor Katherine W. Ferrara, a member of the National Academy of Engineering, after the opening ceremony. Katherine will also deliver the plenary talk titled 'Ultrasound's future within the medical imaging spectrum'. This year we have arranged for three special sessions on Immunotherapy, Brain Applications, and Clinical Experiences. The responsibilities of session chairs in the online meeting are further clarified and the senior session chairs are paired with some junior and industrial members as co-session chairs.

In the meantime, we would like to sincerely thank the Organizing Committee, the Technical Program Committee, all of the other organizers and the attendees for their devotion and constant effort making this conference happen despite the unstable health situation. We also gratefully acknowledge the generous and strong support provided by the sponsors and patrons, and we strongly encourage all the participants to visit their virtual exhibit websites and Gather Town spaces.

We are very much looking forward to meeting you all virtually and welcoming you to the IEEE IUS 2021 in September.

Sincerely,

IUS General Co-Chair
Mingxi Wan, Xi'an Jiaotong University

IUS General Co-Chair
Ayache Bouakaz, Inserm, Tours

IUS Technical Program Co-Chair
Steven Freear, University of Leeds

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Zhen Xu, University of Michigan

IEEE IUS 2021 Plenary Speaker

Sunday, September 12
11:45 am - 12:45 pm Eastern / 11:45 pm – 12:45 am China Standard Time

Katherine Ferrara

Katherine Whittaker Ferrara is a Professor of Radiology. She is a member of the National Academy of Engineering and a fellow of the IEEE, American Association for the Advancement of Science, the Biomedical Engineering Society, the World Molecular Imaging Society, the Acoustical Society of America and the American Institute of Medical and Biological Engineering. Dr. Ferrara received her Ph.D. in 1989 from the University of California, Davis. Prior to her PhD, Dr. Ferrara was a project engineer for General Electric Medical Systems, involved in the development of early magnetic resonance imaging and ultrasound systems. Following an appointment as an Associate Professor in the Department of Biomedical Engineering at the University of Virginia, Charlottesville, Dr. Ferrara served as the founding chair of the Department of Biomedical Engineering at UC Davis. Her laboratory is known for early work in aspects of ultrasonics and has more recently expanded their focus to broadly investigate molecular imaging and drug delivery.

Ultrasound's future within the medical imaging spectrum

Based on Dr. Ferrara's career experience and current position as the Division Chief of the Molecular Imaging Program at Stanford, this presentation will describe translational opportunities and synergies for medical ultrasound within radiology. High channel count ultrasound systems, application specific integrated circuits and GPU computing each contribute to opportunities to advance ultrasound technology. The presentation will particularly focus on new technologies applied in early human studies and clinical trials. Particular areas of focus will include real-time volumetric imaging, personalized treatments with magnetic resonance-guided focused ultrasound, and opportunities for image-guided drug and gene therapy. In the realm of image guidance, the session will highlight synergies with positron emission tomography in the assessment of delivery and gene expression.

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healthcare within reach

Mindray is one of the leading global providers of medical devices and solutions with headquarters in Shenzhen, China. Firmly committed to our mission of "sharing medical technologies with the world", we are dedicated to innovation in the fields of Patient Monitoring & Life Support, In-Vitro Diagnostics, and Medical Imaging System.

Mindray possesses a sound global R&D, marketing and service network. Inspired by the needs of our customers, we adopt advanced technologies and transform them into accessible innovation, bringing healthcare within reach. While improving the quality of care, we help reducing its cost, making it more accessible to a larger part of humanity.

Today, Mindray's products and services can be found in healthcare facilities in over **190** countries and regions. In China, Mindray's products and solutions can be found in nearly **110,000** medical institutions and **99%** of Class A tertiary hospitals.

IEEE IUS 2021 Invited Speakers

Constantin Coussios

University of Oxford

TURN UP THE HEAT OR POP THE BUBBLE? CLINICAL TRANSLATION OF ULTRASOUND-ENHANCED DRU

Over the past 5 years, both thermally-triggered and cavitation-mediated ultrasound-enhanced drug delivery approaches have been translated into early-phase clinical trials for the treatment of solid tumours, demonstrating their potential for significant enhancements in drug delivery, distribution and therapeutic efficacy in solid tumours. The challenges and opportunities presented in clinically translating both of these approaches from bench to bedside will be discussed, with particular reference to the need for scalable thermometry methods, rapid patient-specific modelling of ultrasound propagation based on standard clinically available imaging, and the further development and refinement of methods for mapping and quantifying cavitation activity in patients.

Graeme Woodworth

University of Maryland (Neurosurgery)

MRI-GUIDED, ACOUSTIC EMISSIONS-INFORMED, MICROBUBBLE-ENHANCED ULTRASOUND FOR CONTROLLED BLOOD-BRAIN BARRIER OPENING

Dr. Woodworth's clinical research team is leading the first-in-human US clinical trials studying MRI-guided focused ultrasound-mediated blood brain barrier disruption (MRgFUS-BBBD) in brain tumor patients. These studies are designed to evaluate the safety and feasibility of MRgFUS BBBD, with the eventual goal of using this technology to improve therapeutic delivery to and effects against intrinsic brain tumors.

Dr. Hong Chen

Washington University in St. Louis

SONOBIOPSY FOR NONINVASIVE AND SPATIOTEMPORALLY CONTROLLED BRAIN TUMOR LIQUID BIOPSIES

Brain tumors severely threaten human health due to their fast development and poor prognosis. The current standard of care relies on MRI to identify suspicious tumor lesions, followed by surgical resection or stereotactic biopsy for histological confirmation. However, invasive brain tumor biopsy carries a 5–7% risk of major morbidity. It may not be possible at all to perform this procedure on medically inoperable patients or patients with tumors in surgically inaccessible locations. Repeated tissue biopsies to assess treatment response and recurrence are often not feasible given the increased risk for complications and morbidity. These challenges limit the timely diagnosis and selection of treatment options, hinder a better understanding of the disease, and impair the development of effective treatment approaches. Blood-based liquid biopsy provides a noninvasive strategy for tumor diagnosis, but its application in brain tumors has remained challenging. This is partially due to the blood-brain barrier (BBB), which is a physical obstacle preventing the transfer of brain tumor biomarkers into the peripheral circulation, resulting in extremely low concentrations of circulating biomarkers. To address this challenge, we developed a technique called sonobiopsy, which used focused ultrasound (FUS) to disrupt the BBB and release tumor biomarkers into the blood circulating, enabling molecular characterization of the brain tumor without surgery. Sonogiopbys provides a promising technique for noninvasive and spatiotemporal controlled molecular diagnosis of brain tumors. It has the potential to radically advance the diagnosis, monitoring, and understanding of brain tumors by precisely, rapidly, and safely identifying tumor molecular signatures.

Prof. Vittorio Ferrari

University of Brescia

ENERGY HARVESTING AND PASSIVE RESONATORS WITH CONTACTLESS INTERROGATION FOR STAND-ALONE SENSORS BASED ON PIEZOELECTRIC FILMS

One of the main trends in sensors for both research and industrial applications is to increasingly aim at freestanding sensor units with wireless signal transmission, often across a short range. Eliminating cables requires means to make energy available in the sensor unit for power supply. On-board energy sources, such as batteries, are still the primary choice, yet they suffer limitations in terms of depletion and need for recharge/replacement, which makes them unsuitable in many applications and ultimately demands for new solutions in the long run. In order to develop stand-alone sensor units, two attractive options, each with specific features, are either energy harvesting to power sensors from the surroundings, thereby making them energetically-autonomous nodes, or passive sensors with energy supplied on demand from an external interrogation module. Both options can be enabled by piezoelectric film elements embedded in miniaturized devices. In particular, the piezoelectric effect as a cross-field transduction mechanism between the electrical and mechanical domains can be exploited in either energy harvesting from mechanical inputs or in electromechanical microresonators working as passive sensors coupled to specific external electronics to obtain short-range contactless

readout. The talk will offer an overview of energy harvesters from vibration and motion and of resonant sensors with contactless interrogation based on piezoelectric films and present examples of stand-alone sensors.

Prof. Ashwin Seshia

University of Cambridge

PHONONIC FREQUENCY COMBS IN MICROELECTROMECHANICAL SYSTEMS

Phononic frequency combs are the mechanical analogue of optical frequency combs These frequency combs (response features evidenced as a series of equispaced discrete spectral lines) have been experimentally observed in a multitude of microelectromechanical devices confirming theoretical predictions of such phenomena in FPU chains. The formation of phononic frequency combs is mediated by nonlinear mode coupling and mixing, where comb-like spectra in the RF can be generated by driving a microelectromechanical device via a single-tone drive signal. The first systematic experimental observations were made in a system comprising two coupled modes in a single resonator device, and this has been recently followed by observations of the same phenomena in micromechanical systems comprising three coupled modes, and in coupled devices where multiple comb regimes can co-exist, with comb features defined by the system and drive parameters. While the engineering of optical frequency combs has significantly impacted the fields of time and frequency metrology and molecular spectroscopy, phononic frequency combs similarly have the potential to enable new applications such as stable resonance tracking in physical sensors, broadband vibration energy harvesting, and as component technologies for wireless communication systems and quantum information processing.

Dr. Olivier Bernard

Creatis Laboratory, University of Lyon

HOW WILL ECHOCARDIOGRAPHY BENEFIT FROM DEEP LEARNING?

For several years now, deep learning techniques have been successfully applied to medical imaging in general, and echocardiography in particular. Far from being the promised panacea, these methods have allowed major advances in many specific areas such as echocardiogram analysis, view classification, recognition and segmentation of anatomical structures, user guidance or even automatic report generation. Moreover, the combination of these different techniques allows the deployment of complete and fully automated processing chains, making it possible to increase the reliability of clinical measurements and facilitate the use of ultrasound scanners outside of hospitals. In my talk, I will describe proven deep learning techniques, why they have led to significant improvements in many cardio-vascular applications, their limitations, and the innovations needed to keep the echocardiographic imaging revolution moving forward.

Dr. Petros Mouratidis

The Institute of Cancer Research London

THE COMBINATION OF FOCUSED ULTRASOUND AND IMMUNOTHERAPY FOR PANCREATIC CANCER THERAPY

Pancreatic ductal adenocarcinoma (PDAC) is a disease with a dismal prognosis and is refractory to traditional oncologic interventions. Checkpoint inhibitor immunotherapy has failed to improve patient survival. This is partly due to the low vascularity, dense stroma and high interstitial pressure typical of PDAC tumours, and partly due to their low immunogenicity. For these reasons the development of treatment protocols to combine immunotherapy with modalities like focused ultrasound that could render “hot” immunologically “cold” tumours, and increase their permeability to immunotherapeutic agents are urgently needed. In this talk, past and recent evidence of ultrasound-induced immune stimulation in PDAC patients and preclinical models will be presented. Then we will show how pulsed high intensity focused ultrasound can be used in combination with checkpoint inhibitor immunotherapy to enhance the survival of murine subjects carrying orthotopic pancreatic tumours. In the last part of the talk results on the use of focused ultrasound to facilitate the infection of PDAC tumours by oncolytic viruses will be presented.

Dr. Marvin M. Doyley

University of Rochester

ELASTOGRAPHIC IMAGING OF TUMOR MICROENVIRONMENT

Pancreatic ductal adenocarcinoma (PDAC) has a 5-year survival rate of less than 10%. Surgical resection is the most effective therapy, but only 15-20% of pancreatic cancer patients have resectable disease at diagnosis. For a subset of patients with borderline resectable tumors, neoadjuvant therapies can downstage the tumor and enable surgical resection. However, the tumor microenvironment (TME) limits the ability of neoadjuvant therapies to do so. X-ray computed tomography provides information about major blood vessels and soft tissue geometry, but it does not provide information about tumor microenvironmental changes. In this talk, I will report the results of our preclinical studies that demonstrate that elastography is a good surrogate imaging biomarker for assessing changes in pancreatic cancer’s tumor microenvironment during different neoadjuvant therapies.

Prof. David Horsley

University of California Davis

COMMERCIALIZATION OF PMUT-BASED ULTRASONIC TIME-OF-FLIGHT RANGE SENSORS

Ultrasonic sensors based on bulk piezoelectric ceramics are widely used in range-finding applications today. In 2019, we introduced a new type of ultrasonic sensor based on a piezoelectric micromachined ultrasonic transducer (PMUT) combined with a custom application specific integrated circuit (ASIC) in a 3.5 x 3.5 x 1.25 mm3 package. Originally conceived in a university research project, we started a company, Chirp Microsystems (acquired in 2018 by TDK Inc.), to bring these sensors into mass production. The sensor's signal processing ASIC incorporates a programmable microprocessor, enabling the sensor to perform various application-specific algorithms, from basic time-of-flight range-finding to human presence detection. Relative to competing range sensors based on infrared time-of-flight, PMUT-based ultrasonic ToF sensors have numerous advantages, including much lower supply current (10 μA from a 1.8V supply), the ability to operate in direct sunlight, and the ability to detect transparent or black targets. We will present data on two ultrasonic sensors, the first targeted at short-range, high-sample rate applications, such as robotics, and a second targeted a longer-range applications, such as human presence detection.

Prof. Zhen Xu

University of Michigan

HISTOTRIPSY FOR BRAIN APPLICATIONS

Histotripsy uses microsecond-length ultrasound pulses to generate focal cavitation to liquefy the target tissue into acellular homogenate. Applied through excised human skulls, histotripsy has been shown to treat locations from the skull base to 5 mm from the inner skull surface as well as volume targets. By using a very low duty cycle (<0.1%), overheating to the skull can be prevented. This allows transcranial histotripsy to overcome the treatment location and volume limitations of transcranial focused ultrasound thermal ablation. This talk presents the latest results on the development of transcranial histotripsy systems, in vivo data on using transcranial MR-guided histotripsy in the porcine brain through an excised human skull, and in vivo data on transcranial histotripsy in murine brain tumor models.

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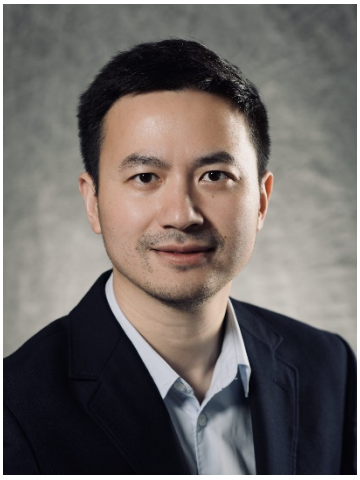
Gernot Fattinger

Qorvo

5G: REVOLUTION OR EVOLUTION?

5G has been hailed by many in the industry as the advent of mm-wave technology becoming mainstream in mobile device communication. However, over the last several years, the focus of what is indeed being implemented and rolled out has shifted away significantly from the mm-wave domain. And there are good reasons for this. This paper will discuss the underlying physical principles, of propagation loss, diffraction, materials penetration, power efficiency and battery lifetime. Based on these underpinnings, we will take a look at the dynamics of the 5G roll-out over the next few years. Furthermore, the impact on RF front-end module architecture will be discussed. The conclusions will be broken down into consequences for the individual technologies involved, and the technological and architectural challenges that could potentially arise. Finally, the three pillars of mobile technology development – performance, size, and cost – will be re-evaluated under the boundary conditions derived from above.



Prof. Songbin Gong

University of Illinois Urbana-Champaign

LITHIUM NIOBATE-BASED RF MICROSYSTEMS: ADVANCES AND PROSPECTS

This talk will review the recent advances made in leveraging Lithium Niobate (LN) thin films to engineer RF microsystems, including resonators, filters, delay lines, circulators, and oscillators. The discussion will first give an overview of the material properties of LN and the film transfer techniques that are foundational to enabling various configurations of thin-film LN on a carrier. Next, These configurations and their benefits for realizing different vibrational modes will be offered. Multiple microsystems are then shown to exemplify how material-level advances can translate to device-level breakthroughs. Finally, prospects hold by LN-based RF microsystems will be discussed in the hope of charting a path to successful commercialization.

Prof. Ping Liang

The Fifth Medical Center of Chinese PLA General Hospital

IMPROVING B-MODE ULTRASOUND DIAGNOSTIC PERFORMANCE FOR FOCAL LIVER LESIONS USING DEEP LEARNING

The liver is the largest digestive gland in the body and there are dozens of types of focal liver lesions (FLLs) including benign, malignant and non-neoplastic lesions. It is important to precisely identify the characteristics of FLLs for it is the basis of providing reasonable treatment guidance for patients. Ultrasound (US), as the most widely used imaging modality in work-up of FLLs, its diagnosis of FLLs is often subjective process requiring substantial experience and expertise of radiologists. Therefore, diagnosis of FLLs has led to increasingly use the time and cost-consuming MRI/CT and even invasive biopsy in clinical practice. It is necessary for the development of methods that serve as an instrument that identify the dominant US features to accurately classify FLLs and narrow the gap between the radiologists with different experience level. Deep convolutional neural network, as a newly emerging technique, provides new opportunity for FLLs diagnosis by US image. It can provide automated quantification of large amounts of image features from medical images, which has the potential to uncover disease characteristics that fail to be appreciated by naked eyes. In this presentation, we will demonstrate a deep convolutional neural network model for classifying of malignant from benign FLLs. Our study indicates that the diagnosis capability of our model was comparable to contrast enhanced CT and superior to skilled radiologists with 15-year experience in FLLs diagnosis performance. The high performance of deep learning model may fuel the time-consuming and relatively expensive contrast enhanced imaging to concentrate on uncertain or complex cases in order to filtrate highly benign or non-urgent cases for clinicians. In addition, it can also maximize healthcare resources and assist less-experienced radiologists from low-volume hospitals to improve their diagnostic accuracy of liver cancer, similar to the level of CECT and rich-experienced radiologists. Furthermore, it has a high potential to contribute to narrow the gap between the radiologists with different experience level and reduce the barriers for rural and community hospitals with relatively scarce of medical resources to improve the FLL diagnosis.

Prof. Piotr Kielczyński

Polish Academy of Sciences

NEW FASCINATING PROPERTIES AND POTENTIAL APPLICATIONS OF LOVE SURFACE WAVES

Love surface waves are elastic waves propagating in waveguides composed of a surface layer deposited on a semi-infinite substrate. The mechanical displacement of Love waves decreases rapidly, as a function of depth, therefore the energy of the Love wave can attain very high densities in the vicinity of the waveguide surface. This fact was crucial in development of Love wave sensors that are strongly affected by the parameters of the surrounding viscoelastic liquid. On the other hand, Love surface waves have many unique features that differentiate them from other types of surface waves, such Rayleigh, Lamb or Stoneley waves. For example, Love surface waves: have only one shear horizontal (SH) component of vibration (mechanical displacement) have mathematical model with a moderate complexity have an exact analogue in electromagnetism (TM and TE modes in planar dielectric waveguides) have a direct analogy in quantum mechanics (quantum particles in potential wells). Love surface waves were predicted theoretically in 1911 by the prominent British scientist A. E. H. Love, who analyzed seismic data registered in wake of Earthquakes. In fact, Love surface waves are most destructive of all seismic waves, since they may generate huge shear forces that can literally cut-off foundations of most civil engineering structures. On the other hand, Love surface waves revealed their benign face by the end of the twentieth century with the advent of Love wave bio, chemo and physico-sensors with parameters superior to those achievable with other types of acoustic sensors. Despite their centennial history Love surface waves do not cease to surprise us by unveiling their new unexpected properties and possibilities for novel applications. Indeed, in recent two years the author of this presentation discovered a number of new original phenomena that occur in lossy Love wave waveguides loaded with a viscoelastic liquid that were entirely unexpected and are to some extent completely counterintuitive. As an example we can mention the occurrence of abrupt changes in phase velocity v_p and attenuation α, as a function of viscosity η_0 of the loading Newtonian liquid resonant-like maxima in attenuation, as a function of thickness “”h”” of a lossy surface layer and frequency f maximum in attenuation α as a function of viscosity η_0 of the loading Newtonian liquid minimum in phase velocity v_p as a function of viscosity η_0 of the loading Newtonian liquid In fact, the phase velocity v_p and attenuation α of the Love wave can abruptly change not only their values but also their qualitative character, e.g., from aperiodic to oscillatory and vice-versa, for a certain value of viscosity of the loading Newtonian liquid. The above phenomena can occur only in multilayer Love wave waveguides with a number of surface layers N≥2. These phenomena may be attributed to a sudden repartition of Love wave energy from one surface layer to another. The author intends to cover in this presentation the following topics: 1. basic properties of Love surface waves 2. applications of Love waves in seismology and sensor technology 3. mathematical models (direct Sturm-Liouville problems) of Love surface waves 4. analogies in electromagnetism and quantum mechanics 5. power flow in Love wave waveguides (Poynting vector) 6. new counter intuitively phenomena discovered in Love wave waveguides: a) minimum of the phase velocity as a function of viscosity of the loading Newtonian liquid b) maximum of the attenuation as a function of viscosity of the loading Newtonian liquid 7. new unexpected phenomena in Love wave waveguides: a) sudden qualitative changes in phase velocity and attenuation as a function of waveguide parameters b) resonant-like attenuation of Love waves, etc. 8. new mathematical tools applied in analyze of Love wave waveguides a) Inverse Sturm-Liouville Problem that may revolutionize Love wave sensors b) modified Auld’s perturbation formula expressed entirely in term of the complex power flow in Love wave waveguides 9. new potential applications of Love surface waves in sensors and signal processing.

Dr. Clifford Cho

University of Michigan Medical School

IMMUNOTHERAPEUTIC IMPLICATIONS OF HISTOTRIPSY FOCUSED ULTRASOUND ABLATION

In this presentation, we will review recent observations made regarding the ability of histotripsy to incite local pro-inflammatory immunogenic cell death and systemic anti-tumor immune responses. Possible underlying mechanisms for these observations and their potential clinical application will be explored.

Prof. Dr. Hui-Xiong Xu

Shanghai Tenth People's Hospital

TOWARDS A TUMOR-FREE WORLD: WHEN ULTRASOUND MEETS IMMUNOTHERAPY

Combined checkpoint blockade (e.g., PD1/PD-L1) with traditional clinical therapies can be hampered by side effects and low tumour-therapeutic outcome, hindering broad clinical translation. Here we report a combined tumour-therapeutic modality based on integrating nanosonosensitizers-augmented noninvasive sonodynamic therapy (SDT) with checkpointblockade immunotherapy. All components of the nanosonosensitizers (HMME/R837@Lip) are clinically approved, wherein liposomes act as carriers to co-encapsulate sonosensitizers (hematoporphyrin monomethyl ether (HMME)) and immune adjuvant (imiquimod (R837)). Using multiple tumour models, we demonstrate that combining nanosonosensitizersaugmented SDT with anti-PD-L1 induces an anti-tumour response, which not only arrests primary tumour progression, but also prevents lung metastasis. Furthermore, the combined treatment strategy offers a long-term immunological memory function, which can protect against tumour rechallenge after elimination of the initial tumours. Therefore, this work represents a proof-of-concept combinatorial tumour therapeutics based on noninvasive tumours-therapeutic modality with immunotherapy.

Dr. Klazina Kooiman

Erasmus MC

MICROBUBBLE-MEDIATED DRUG DELIVERY REVEALED AT MICROSECOND AND MICROMETER RESOLUTION

Treating cardiovascular disease and cancer using ultrasound-activated vibrating microbubbles (1-10 μm in size) has shown preclinical potential to boost drug therapy and reduce side-effects because drugs are delivered locally. Recently, several clinical trials have demonstrated safety of the treatment and increased survival. Despite advances in the field, the underlying mechanism of microbubble-mediated drug delivery are poorly understood. One of the reasons for this is the huge range in time scales involved. The time scale of the microbubble vibration is 2 million times per second in a 2 MHz ultrasound field (microseconds), which is many orders of magnitude smaller than the time scale of physiological effects (milliseconds), let alone that of biological effects (seconds to minutes) and clinical relevance (days to months). To allow the investigation of the microbubble-cell-drug interaction at a microsecond and micrometer resolution, unique technology was created by coupling the Brandaris 128 ultra-high-speed camera (~25 million frames per second recordings) to a custom-built confocal microscope. In this talk, I will describe new insights gained into the microbubble-cell-drug interaction by using this technology for two different cell types: endothelial cells and bacteria. For endothelial cells the focus will be on the microbubble behavior in relation to the drug delivery pathways sonoporation and cell-cell contact opening, as well as how intracellular calcium fluctuations play a role. Novel microbubble-mediated treatments for the life-threatening disease bacterial infective endocarditis, either on native heart valves or cardiac devices such as pacemakers, are the focus for the bacteria biofilm work.

Prof. Andrea Alù

City University of New York

EXOTIC SOUND INTERACTIONS IN ACOUSTIC METAMATERIALS

Metamaterials are artificial materials with properties well beyond what offered by nature, providing unprecedented opportunities to tailor and enhance the control of waves. In this talk, I discuss our recent activity in acoustics and mechanics, showing how suitably tailored meta-atoms and their arrangements open exciting venues for new technology. I will focus in particular on the opportunities offered by time modulation and switching, as well as gain, in acoustic metamaterials, which offer an interesting platform for enhanced sensing, one-way signal transport and nonlinear phenomena. These concepts are ideally suited for the new technological opportunities in the context of ultrasound technologies. Physical insights into the underlying phenomena, and new devices based on these concepts will be presented.

Prof. Reimund Gerhard

University of Potsdam

SOFT TRANSDUCER MATERIALS – POLYMER-BASED ELECTRETS FOR SENSORS AND ACTUATORS

Since the first report of natural electrets – pieces of amber that could attract or repel light objects or draw tiny electric sparks – more than 2500 years ago, electret science and technology underwent more and more rapid developments via the electrophorus (1760s) and wax-resin mixtures (1920s) to modern polymer-based electrets. Today, we can distinguish between space-charge electrets, electro-electrets (a.k.a. dielectric elastomers), ferro- or piezo-electrets, ferro-, pyro- and piezoelectric polymers and ceramic-polymer composites. Stress-induced movements of their internal electric charges or dipoles, and electric-field-induced displacements of the charged or poled polymer, give rise to direct and inverse electro-mechanical/piezo-electrical effects, respectively. Longitudinal and transverse transduction effects may be used in sensors (micro-energy harvesters, microphones, etc.) and in actuators (sound and ultrasound emitters, haptic-feedback devices, soft micro-actuators, etc.). A significant range of densities, as well as isotropic or anisotropic elastic properties, of the various soft materials lead to a broad range of specific acoustic impedances. Recent advances, e.g. in polymer science and technology, in rather stable high-field dielectrics, and in additive manufacturing of patterned and heterogeneous materials, promise a bright future for soft transducer materials – in particular, but not only, for sound and ultrasound applications.

Dr. Pintong Huang

The Second Affiliated Hospital of Zhejiang University

CONTRAST ENHANCED ULTRASOUND FROM DIAGNOSTICS TO THE THERAPY

The emergence of CEUS has brought about a new revolution in ultrasound imaging. CEUS has been increasingly mature in diagnosing different kinds of diseases over the recent years. Meanwhile, the interaction between ultrasound and MBs can induce various acoustic effects, including thermo effect, sonoporation, and cavitation. In the recent decade, more and more researches indicated that ultrasound mediated microbubble stable cavitation (UMMC), as an anti-tumor drug delivery system, played a supplementary role in tumor therapy. In this presentation, I will provide an overview of approved and off-labeled clinical applications of CEUS, and some pre-clinical results of UMMC in tumor therapy and T2DM therapy in animal models from our group. Our studies indicated that UMMD could inhibit the growth of VX2 hepatic tumors in rabbits by irreversible destroying tumor microvessel and tumor cells. Meanwhile, UTMD GLP-1 gene therapy may be an effective approach to regenerate islet beta cells and normalize glycemic control in type 2 diabetes humans.

Prof. Hairong Zheng

Shenzhen Institute of Advanced Technology

MAGNETIC RESONANCE IMAGING-GUIDED ULTRASOUND BRAIN STIMULATION IN NON-HUMAN PRIMATES

Neuromodulation is a fundamental tool in neuroscience to explore neural mechanisms from molecular to behavioral levels. Recently, ultrasound has been found to be an effective noninvasive neuromodulation tool. This cutting-edge discovery may have great potential for the therapy of many functional brain diseases. One major limitation of ultrasound neuromodulation is the accurate steering of ultrasound beams throughout the skull to the target position inside the brain. Magnetic resonance imaging (MRI) plays an important role in the precise and dynamic guidance of ultrasound neuromodulation by providing target localization, neural activity monitoring, and safety assurance. In the presentation, MRI-guided ultrasound neuromodulation techniques are reviewed, including transcranial focused ultrasound technology, localization and visualization by magnetic resonance (MR) acoustic radiation force imaging, brain activity monitoring and assessment by functional MRI, and applications of ultrasound neuromodulation. The principles of all the above-mentioned techniques are briefly introduced, and some preliminary results of our group are described. The results of our study showed that ultrasound stimulation of the primary visual cortex of rhesus monkeys activated the target area and its downstream and associated brain regions, which suggested that ultrasound stimulation is capable of exciting neuronal activities that may be transmitted to related functional regions. MRI is believed to be a powerful imaging modality for accurate ultrasound neuromodulation.

Dr. Marie Muller

North Carolina State University

LEVERAGING SCATTERING TO UNLOCK LUNG QUANTITATIVE ULTRASOUND

Conventional ultrasound imaging of the lung has remained elusive due to the complexity of the parenchyma. The millions of air-filled alveoli are responsible for large amounts of scattering, precluding the common assumptions underlying B-mode imaging. We propose to leverage this purported weakness. Each scattering event can be seen as an opportunity for the ultrasound wave to embed information on the architecture of lung parenchyma. By leveraging scattering, we developed new methods for the quantitative assessment of the lung. The diffusivity of ultrasound is exploited as a new source of contrast for lung tissue characterization. Lung diseases such as pulmonary edema and pulmonary fibrosis affect the micro-architecture of the parenchyma. We show how ultrasound scattering parameters can be used to quantify these changes, and ultimately be used as a biomarkers for these diseases. There is tremendous potential of such non-invasive biomarkers for monitoring and follow up of response to treatment. Finally, we will also show how these concepts can be used for ultrasound-based lung imaging to detect and localize pulmonary nodules in real time during surgery, to ensure lung nodules resection with safe margins so no cancerous tissue is left behind.

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Dr. Richard J. Price

University of Virginia

PROMOTING THE CANCER IMMUNITY CYCLE WITH FOCUSED ULTRASOUND

In this presentation, I will provide an overview of recent studies from our group aimed at driving anti-cancer immunity using both thermal and mechanical forms of focused ultrasound energy deposition. Our research in thermal focused ultrasound centers primarily on applications for breast cancer and melanoma. Here, we employ a variety of pre-clinical approaches (e.g. flow cytometry and RNA sequencing) to understand how the immune system is modulated by focused ultrasound, as well as to design and implement new immunotherapeutic regimens that will most effectively cooperate with focused ultrasound. Ongoing clinical trials at our institution are now exploring how partial thermal ablation interacts with checkpoint inhibitors in patients with metastatic disease. Meanwhile, our research on mechanical forms of focused ultrasound primarily entails lifting immunosuppression in brain tumors via the delivery of immunotherapies across the blood-brain tumor barrier under MR image-guidance.

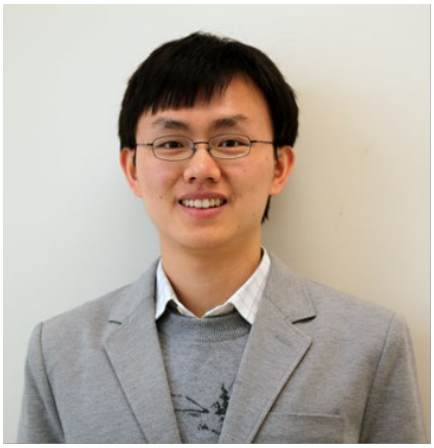
Prof. Che Ting Chan

Hong Kong University of Science and Technology

USING ACOUSTICS TO DEMONSTRATE TOPOLOGICAL AND NON-HERMITIAN PHYSICS

Acoustic systems are relatively simple to design, implement and characterize. As such, they are good platforms to demonstrate new physics concepts and the associated phenomena. We will use some examples to illustrate the realization of topological and non-Hermitian physics in acoustic systems. We show that an acoustic metamaterial consisting of an array of spinning cylindrical inclusions can possess many novel properties that cannot be achieved in static systems. These interesting effects include folded bulk bands and folded interface-state bands. The folding of bands inside the first Brillouin zone is generally not possible because such dispersions violate causality principles but in acoustic systems with rotation, this is made possible by a rotation-induced anti-resonance of compressibility and the rotational Doppler effect. Robust one-way transport properties can be enabled by non-degenerate interface states, but within the same band, interface states at different frequencies can have different propagation directions. If we form an interface between two acoustic crystals composing of spinning cylinders with equal but opposite spinning velocities embedded in a liquid, long-range and robust acoustic pulling can be enabled by a pair of one-way chiral surface waves supported on the interface between two counter-rotating phononic crystals. When the chiral surface mode with a relative small Bloch wave vector is excited, the particle located in the interface waveguide will scatter the excited surface mode to another chiral surface mode with a greater Bloch wave vector, and resulting in an acoustic pulling force, irrespective of the size and material of the particle. The absence of backscattering channels make the pulling force robust against local disorders, and the particle can be pulled in any trajectory as determined by the shape of the interface. This new acoustic pulling scheme overcomes some of the limitations of the traditional acoustic pulling using structured beams, such as short pulling distances, straight-line type

pulling and strong dependence on the scattering properties of the particle. Acoustic systems are also good platforms to illustrate exceptional point physics. The signature of non-Hermitian systems is the existence of exceptional points. In some cases, the exceptional points can form interesting connected structures. We will see that an astroid shaped loop of exceptional points can emerge from a non-Hermitician Lieb lattice when specific hoppings are introduced. Such interesting exceptional point structure is realized in an acoustic implementation, which demonstrates that exceptional nexus with a hybrid topological invariant can be formed.



Prof. Sheng Xu

UC San Diego

SOFT ULTRASONIC PATCHES FOR CONTINUOUS MONITORING OF DEEP TISSUES

Soft electronic devices that can acquire vital signs from the human body represent an important trend for healthcare. Combined strategies of materials design and advanced microfabrication allow the integration of a variety of components and devices on a stretchable platform, resulting in functional systems with minimal constraints on the human body. In this presentation, I will demonstrate a soft ultrasonic patch that can emit ultrasound waves to penetrate the skin and noninvasively capture dynamic events in deep tissues, such as blood pressure and blood flow waveforms in central arteries and veins. This stretchable platform holds profound implications for a wide range of applications in consumer electronics, sports medicine, defense, and clinical practices.

Gengkai Hu

Beijing Institute of Technology

CONTROLLING ELASTIC WAVE WITH SOLID PENTAMODE METAMATERIALS

Solid pentamode materials are degenerated elastic solids with quasi-zero shear rigidity, it can be approximately realized by genius microstructure design. Due to the flexibility in designing wave impedance, the pentamode material is potential for the control of elastic waves with broad frequency performance. In this talk, the concept and design method of pentamode materials are firstly explained, then two examples are provided to illustrate the capacity of wave manipulation by this kind of material. The first example focuses on elastic wave filtering, pentamode materials are shown to be able to support only single polarization mode (either transverse wave or longitudinal wave) depending on their microstructure design, which can hardly be possible with traditional solids. The functions of elastic wave mode splitting and sound isolation in water with this kind of metamaterials are illustrated. The second example explores broadband underwater acoustic cloak. It is shown that by carefully designing unit cells of pentamode materials and arranging them in space, a broadband underwater acoustic cloak can be designed. Both examples are validated by experiments. These findings demonstrate a great capacity of broadband mechanical wave control by solid pentamode materials.

Prof. Ken-ya Hashimoto

University of Electronic Science and Technology of China

QUANTUM LEAP IN SIMULATION TECHNOLOGIES FOR RADIO FREQUENCY ACOUSTIC WAVE DEVICES GIFTED BY HIERARCHICAL CASCADING TECHNIQUE

This talk is aimed at introducing the hierarchical cascading technique (HCT) not only as a speed-up tool for FEM simulation but also as a versatile technique for attacking unexplored problems. In 2016, Koskela, et al., proposed HCT for fast 2D FEM simulation of SAW devices. The technique is quite powerful when the device structure under concern is mainly composed of identical cells and the number of cells N is large. This is because the time consumption is almost proportional to logN, while the required memory is almost independent of N. Now HCT-based 2D FEM is widely used in SAW device development. The author's group applied HCT to attack various wave excitation and scattering problems including those believed to be impossible. Examples are SAW scattering at irregularity inserted in an infinitely long grating and that at IDT finger tips. The traveling wave excitation source proposed by the author's group fits well with HCT and can be adapted efficiently in the analysis. In addition, combination of HCT with high-end GPU makes 3D FEM simulation possible for practical SAW device structures. Now we can apply periodic 2D, full 2D, periodic 3D and full 3D FEM simulations to SAW resonators. Comparison of results from these simulations enables evaluation of different loss contributions separately, and field analyses may reveal remaining loss mechanisms hidden in the structures. Once the degradation mechanism is understood, we can search possible countermeasures using the fast parameter-scan function of HCT-based FEM.

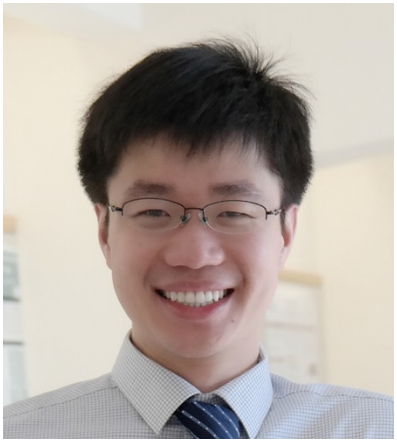
Dr. Ionut Radu

Soitec

HETEROGENEOUS MATERIAL INTEGRATION: FROM ADVANCED SUBSTRATES TO ACOUSTIC RESONATORS

The innovation of advanced substrates reflects today's new paradigm for semiconductor technologies: key figures of merit for most advanced device technologies depend on the starting substrate material. Thin film technologies are currently being used for advanced MEMS such as acoustic filters and ultrasonic devices. Combined with single-crystalline quality of the materials, such engineered substrates enable higher device performance and better manufacturing yield. This paper reports on recent advances in material innovation and substrate technologies enabling high performance acoustic and ultrasound resonators. One example is the SAW resonators using guided acoustic modes of Piezoelectric-On-Insulator (POI) substrate combining single-crystal LiTaO3 thin film, an intermediate SiO2 layer and Silicon handle substrate. The SAW resonators fabricated using POI substrate lead to significant performance improvements compared to the conventional bulk substrates, such as very low TCF, higher coupling factor, lowest RF losses and maximum quality factor (Bode-Q). The Smart CutTM technology provides a versatile manufacturing platform for POI advanced substrates and can be adapted to different piezoelectric materials (LiTaO3, LiNbO3, etc), various crystal orientations and film thicknesses. Therefore, it enables new solutions for acoustic filter designers to overcome some of the 5G technological challenges and further explore new device

concepts. This work is based on contributions of many colleagues from Soitec, frec|n|sys and collaboration projects with CEA-LETI under the Substrate Innovation Center.



Dr. Junjie Yao

Duke University

BREAKING LIMITS IN PHOTOACOUSTIC IMAGING: DEEPER, FASTER, SMALLER AND MORE COLORFUL

By acoustically detecting the optical absorption contrast in biological tissues, photoacoustic imaging (PAI) has proven increasingly powerful for multi-scale anatomical, functional, and molecular imaging. In PAI, a short-pulsed laser beam illuminates the biological tissue to generate a small but rapid temperature rise, which leads to emission of ultrasonic waves due to thermoelastic expansion. The wideband ultrasonic waves are detected to form a high-resolution tomographic image that maps the original optical absorption in the tissue. My talk will focus on several major new fronts of PAI that have collectively enabled fast, miniaturized, deep, and high-sensitivity biomedical applications in functional neuronal imaging, drug testing, early cancer detection, and interventional therapy. First, PAI has broken the penetration limit and achieved super-deep (~10 cm) imaging by using advanced internal light delivery, extending its applications ready into internal organ imaging on large animal models. Second, by innovating novel scanning technologies, PAI has been accelerated by more than 1000 times in imaging speed with a large field of view and high spatial resolution, allowing for the monitoring of highly dynamic biological processes. Third, by adapting novel fabrication technologies in optics and acoustics, miniaturized PAI has achieved handheld, wearable and head-mounted imaging with high spatial–temporal resolutions and high throughput. Lastly, taking advantage of switchable or tunable near-infrared photoacoustic-specific probes, PAI has improved its sensitivity and specificity by more than 100 times, enabling highly sensitive detection of malignant cancer, tissue hypoxia, and neuronal activities.

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Opening

11:30 am - 11:45 am
2021 Biomedical Engineering Award

11:45 am - 12:45 pm
Plenary Talk: Ultrasound's Future Within the Medical Imaging Spectrum
Katherine Ferrera

12:45 pm - 1:45 pm
Awards (UFFC & Ultrasonics Awards)

THURS, SEPTEMBER 16, 2021

11:45 am - 12:30 pm
Closing Session & Student Awards

IEEE IUS 2021 Short Courses

*Must be registered for short course in addition to conference

*Eastern Time

SAT, SEPTEMBER 11, 2021

9:00 am - 1:00 pm

Finite Element Modelling of Acoustic Resonators (LIVE)
Yook-Kong Yong

Laser-Generated Surface Acoustic Waves: A Tool for Physicists, Material Scientists, And Engineers (LIVE)
Alexei Maznev

Medical Ultrasound Transducers (LIVE)
Scott Smith, David Mills

MEMS Technology for Acoustic Wave Devices (LIVE)
Songbin Gong, Shuji Tanaka

Ultrafast Ultrasound Imaging: Basic Principles and Applications (LIVE)
Mickael Tanter

SUN, SEPTEMBER 12, 2021

6:00 am - 9:00 am

Artificial Intelligence in Ultrasound Imaging (LIVE)
Yonina Eldar, Ruud JG van Sloun

7:00 am - 11:00 am

Piezoelectric Fundamentals: Materials and Transducers (LIVE)
Susan Trolier-McKinstry, Sandy Cochran

9:00 am - 10:00 am

Essentials Of Ultrasound Imaging: An Introduction (Q&A)
Thomas Szabo, Peter Kaczkowski

Fundamentals Of Physical Acoustic Waves (Q&A)
Ji Wang

Super-Resolution Ultrasound (Q&A)
Olivier Couture, Vincent Hingot

10:00 am - 11:00 am

Acoustic Tweezing (Q&A)
Charles Courtney

Machine Learning and Signal Analysis for Ultrasonic Imaging, Nondestructive Testing and Communication Applications (Q&A)
Erdal Oruklu, Jafar Saniie

Motion Estimation Algorithms in Ultrasound Imaging: Principles and Hands-On (Q&A)
Damien Garcia

Multi-Physical Fields Coupled Model of SAW Resonators by Finite Element Method (Q&A)
Tao Han

Ultrasound Signal Processing with GPUs — Introduction to Parallel Programming (Q&A)
Marcin Lewandowski, Billy Yiu, Piotr Jarosik, Mateusz Walczak, Piotr Karwat, Ziemowit Klimonda, Julia Lewandowska

IEEE IUS 2021 Patron Webinars

***Eastern Time**

SUN, SEPTEMBER 12, 2021

4:00 pm - 5:00 pm
Patron Webinar: VINNO Technology

MON, SEPTEMBER 13, 2021

7:15 am - 7:30 am
Patron Webinar: Ecare

7:30 am - 7:45 am
Patron Webinar: Us4us

12:15 pm - 1:15 pm
Patron Webinar: Verasonics: An Overview of The HIFUPlex Elite USgFUS Platforms for Small and Large Subjects

1:15 pm - 2:15 pm
Patron Webinar: FUJIFILM: Vevo F2 And VADA: Bridging the Gap Between Acoustics Theory and Preclinical Imaging

2:15 pm - 2:30 pm
Patron Webinar: Doppler: Novascan Phased Array Detector with TFM And Its Applicition

4:00 pm - 5:00 pm
Patron Webinar: VINNO Technology 2

TUE, SEPTEMBER 14, 2021

5:45 am - 6:15 am
Patron Webinar: Acoustic Life Science

1:30 pm - 2:30 pm
Patron Webinar: Verasonics: Ultrafast Volume Imaging and The Vantage System

4:00 pm - 5:00 pm
Patron Webinar: VINNO Technology 3

WED, SEPTEMBER 15, 2021

5:30 am - 8:00 am
Patron Webinar: Mindray: Technology Presentation of Mindray Ultrasound: Advanced Ultrasound Imaging Techniques and Their Clinical Applications

7:30 am - 7:45 am
Patron Webinar: Scia Systems

10:00 am - 10:15 am
Patron Webinar: Focused Ultrasound Foundation

1:30 pm - 2:30 pm
Patron Webinar: Verasonics: SoniVue NDE Research Software

1:30 pm - 2:30 pm
Patron Webinar: Sonic Concepts: Innovative Ultrasound Solutions for The World's Most Complex Problems

THURS, SEPTEMBER 16, 2021

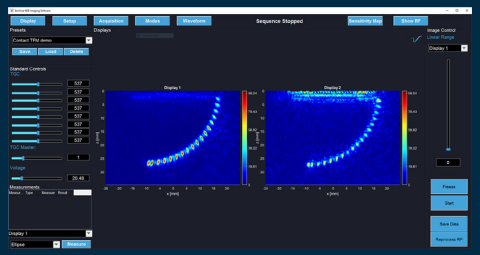
5:45 am - 6:15 am
Patron Webinar: Acoustic Life Science

Verasonics®

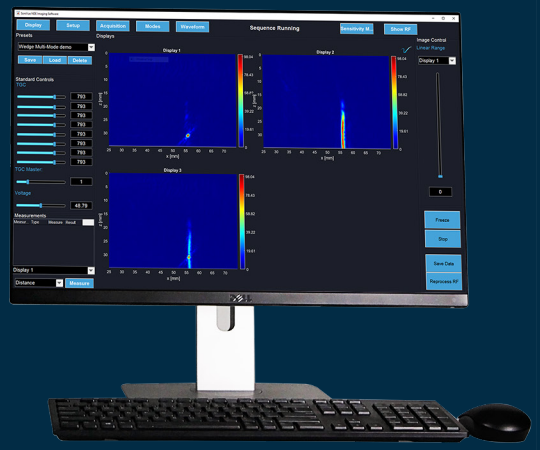
The leader in Research Ultrasound™

SoniVue™ NDE research software – a tool for advanced, high-speed and custom array imaging.

- Real-time, high-speed multi-mode TFM imaging.
  - All mode conversion permutations of direct, half-skip and full-skip TFM.
  - Create multiple image displays with any combinations of modes selectable for each display.
  - One and two-array configurations supported for direct or stand-off medium (e.g., wedges or immersion) coupling.
- Supports FMC, HMC and Hadamard encoded acquisition.
- Real-time RF signal and spectrum viewer.
- Sensitivity mapping tool. Generates spatial sensitivity maps of selected modes for point-like or planar reflector defect types.
- Custom imaging for rapid prototyping of new applications and the easy delivery of research and development outcomes.
- Preset saving/loading
- Data reprocessing
- Array and material databases



Custom processed imaging in SoniVue NDE: Native direct TFM and custom processing DORT



Multi-mode wedge imaging of a fatigue crack. Direct + half-skip TFM

To Learn More, Visit us at: www.Verasonics.com

E-mail: info@Verasonics.com

IEEE IUS 2021 Panels

Industry Leadership Panel

Tuesday, September 14 at 12:00 AM (China Standard Time) / Monday, September 13 at 12:00 PM (Eastern Time)

What are the differences working in different sized companies, startup or S&P 500? What is like to work as a manager or an individual contributor? What are the important characters to be industry leaders? What are their personal stories to success? What are they looking for when they hire a new employee? We invited three distinguished industry leaders to share their knowledge and experience.

Moderator: Dr. Jessica Liu Strohmann

Speakers: Dr. Calvin Wang, Dr. Kristen Brosnan, Dr. Jaime Zahorian

From University Lab to Industry Mass Production

Wednesday, September 15 at 1:30 AM (China Standard Time) / Tuesday, September 14 at 1:30 PM (Eastern Time)

Do you plan your career in industry? Do you know the skill shift from university lab to industry mass production? What are the keys to the success of mass production for different size companies? You are invited to join us in this interactive and inspiring panel discussion. We have four distinguished industry leaders to share their experience.

Moderator: Ernest Ting-Ta Yen

Speakers: David A. Feld, Daeho Kim, Paul Pickering

IEEE IUS 2021 Student Events

Student Social

Students attending IEEE IUS 2021 are invited to participate in the STUDENT SOCIAL! Meet other students in a casual setting and network with future colleagues. There will be two opportunities for you to join!

Social 1: Tuesday, Sept. 14 at 2:15 AM (China Standard Time) / Monday, Sept. 13 at 2:15 PM (Eastern Time)

Social 2: Wednesday, Sept. 15 at 4:45 PM (China Standard Time) / 4:45 AM (Eastern Time)

Student-Professional Networking

Students attending IEEE IUS 2021 are invited to participate in the STUDENT-PROFESSIONAL NETWORKING event—connect with leaders in ultrasonics from academia and industry!

Wednesday, Sept. 15 at 3:30 AM (China Standard Time) / Tuesday, Sept. 14 at 3:30 PM (Eastern Time)

Student Pitch Competition

Students attending the IEEE IUS 2021 have the opportunity to participate in the STUDENT PITCH COMPETITION! Deliver a live 60-second pitch on your research, supplemented by a single slide, and win a cash prize!

Thursday, Sept. 16 at 3:15 AM (China Standard Time) / Wednesday, Sept. 15 at 3:15 PM (Eastern Time)

Meet the UFFC Student Reps

Students attending the IEEE IUS 2021 are invited to MEET YOUR STUDENT REPRESENTATIVES! Ask them anything you want to know about the society or their personal experience and let us surprise you with our special guests!

Thursday, Sept. 16 at 10:00 PM (China Standard Time) / Thursday, Sept. 16 at 10:00 AM (Eastern Time)

IEEE IUS 2021 Student Paper Competition Finalists

Group 1

Non-Invasive Real-Time Quantification of Myocardial Anisotropic Elastic Properties in the Human Heart
Olivier Pedreira

Differentiation of Acute Stroke with Noninvasive Volumetric Ultrasound Localization Microscopy in the Rat Brain
Arthur Chavignon

Development of an Integrated Photoacoustic-Guided Laser Ablation Intracardiac Theranostic System
Maryam Basij

Randomly Sparse Reception with Channel-Domain Signal Recovery for High-Volume-Rate Ultrasound Imaging
Dan Ran

Deconstruction and Reconstruction of Image-Degrading Effects in the Human Abdomen: Phase Aberration, Refraction, Multiple Reverberation, and Trailing Reverberation
Danai Eleni Soulioti

In Vivo Assessment of Diabetic Kidney Disease Using Ultrasound Localization Microscopy
Jingke Zhang

Group 2

Electroactive Diffraction Gratings for the Generation of Acoustic Vortex Beams
Rubén Darío Muelas Hurtado Muelas Hurtado

Imaging and Detection of Botrytis Cinerea with Gigahertz Ultrasonic Imager
Yutong Liu

High-Throughput and Rapid Cell Lysis Based on Stable Cavitating Bubble Array
Xiufang Liu

Group 3

Large-Scale Rotational Object Manipulation of Weak-Focused Acoustic Vortex
Qingyu Ma

c-Axis-Tilted ScAlN Film on Silicon Substrate for Surface Acoustic Wave Device
Takumi Tominaga

Three-Dimensional Phononic Crystal with Ultra-Wide Bandgap at Megahertz Frequencies
Julio Andrés Iglesias Martínez

Group 4

Finite Element Simulations for Predicting Nonlinear Responses of Layered SAW Systems
Thomas Forster

An Acoustic Resonator with Electromechanical Coupling of 16% and Low TCF at 5.4 GHz
Ahmed Hassanien

Mechanisms of Third-Order Harmonic in TC-SAW Resonators Using a Nonlinear FEM Model
Peng Guan

Group 5

Miniaturization of Micro-Ultrasound Transducers for Endoscopic Imaging
Carlos Felipe Roa

A Thin, High Penetration Depth Phased Array Transducer with a Metamaterial Acoustic Backing for Cardiac Imaging with X-Ray Computed Tomography Compatibility
Stephan Strassle Rojas

Design and Fabrication of 1D CMUT Arrays for Dual-Mode Acoustic Angiography Applications – Preliminary Results
Muhammetgeldi Annayev

VINNO Technology (Suzhou) Co., Ltd. was established in Suzhou Industrial Park in 2010. The total investment in research and development is more than RMB 500 million presently. VINNO is a manufacturer, which is specialized in Color Doppler Ultrasound System. In the ten years since its establishment, the company has developed more than 90 color ultrasound products. VINNO has nearly 300 global R & D personnel, and has more than 298 patented technologies.

In the past seven years since the products were launched, they has been exported to more than 100 countries and regions around the world such as Europe, America, and Southeast Asia, and entered more than 500 provincial hospitals, becoming the fastest -growing ultrasound brand in the world.

facebook (VINNO Ultrasound) LinkedIn (VINNO Technology)

IEEE IUS 2021 Mentorship Social Mixer

Thursday, September 16 at 1:30 AM (China Standard Time) / Wednesday, September 15 at 1:30 PM (Eastern Time)
Where: Gather Town (https://www.gather.town/)
What: We are getting together to celebrate our achievements in UFFC mentorship program
Related link: https://ieee-uffc.org/mentorship-networking/

Agenda:

Program overview (5 min)
Program announcement (5 min)
Participates “spotlight” video (20 mins)
Social mixer (30 mins)

IEEE IUS 2021 Women in Engineering (She Leads@IUS)

September 13, 2021 from 3:15 – 4:15 PM Eastern / September 14, 2021 from 3:15 – 4:15 AM China Time

After more than a year full of unexpected challenges, She Leads@IUS will bring you a virtual event to meet with woman leaders in ultrasonics from academia and industry at different stages of their careers. Note that everyone can be a leader within their spheres of influence. You will hear stories from our panelists about how they overcome unexpected challenges. You will get involved in the conversations to ask questions and share your stories. You will have networking opportunities with our panelists and attendees. Let's gather in a virtual setting to set a course toward revival from all the unexpected challenges.

Ten cash prizes ($25 for each prize) will be awarded at the end of the event for attendees who answer prize-related questions. The Women in Engineering event can be booked via the conference registration process.

Schedule

3:15-3:20 – Introduction
3:20-3:40 – Panelists talk about their experience through the pandemic and share lessons learned
3:40-3:45 – Follow-up questions for the panelists
3:45-3:55 – Volunteers introduce their name, affiliation, and one topic they are interested in discussing
3:55-4:05: – Breakout room discussions
4:05-4:15: – Reconvene and volunteers share what they learned through the discussion.

Panelists:
Kathy Nightingale, Ph.D.
Theo Pilkington Professor of Biomedical Engineering Duke University, United States

Meaghan O'Reilly, Ph.D.
Senior Scientist, Physical Sciences, Sunnybrook Research Institute, Canada Associate Professor, Medical
Biophysics, University of Toronto, Canada

Sophie Morse, PhD
Research Fellow Imperial College London, United Kingdom

Serish Tanya Hussain
PhD candidate PGR - Next Generation Nuclear University of Leeds, United Kingdom

Jessica Liu Strohmann
Tech Lead Qualcomm Multimedia R&D, United States

Organizers:
Hong Chen, Ph.D.
Associate Professor Washington University in St. Louis, United States

Muyinatu A. Lediju Bell, Ph.D
John C. Malone Assistant Professor & PULSE Lab Director Johns Hopkins University, United States

IEEE IUS 2021 Networking & Breaks

Join Gather.Town for the networking and break sessions! (*Eastern Time)

SUN, SEPTEMBER 12, 2021
11:00 am - 11:15 am
Break/Exhibit Hall/Networking 1

1:45 pm - 2:00 pm
Break/Exhibit Hall/Networking 2

MON, SEPTEMBER 13, 2021
7:45 am - 8:00 am
Break/Exhibit Hall/Networking 3

10:00 am - 10:30 am
Break/Exhibit Hall/Networking 4

12:00 pm - 12:15 pm
Break/Exhibit Hall/Networking 5

TUE, SEPTEMBER 14, 2021
7:45 am - 8:00 am
Break/Exhibit Hall/Networking 6

9:30 am - 10:00 am
Break/Exhibit Hall/Networking 7

11:30 am - 11:45 am
Break/Exhibit Hall/Networking 8

1:15 pm - 1:30 pm
Break/Exhibit Hall/Networking 9

WED, SEPTEMBER 15, 2021
7:45 am - 8:00 am
Break/Exhibit Hall/Networking 10

10:00 am - 10:30 am
Break/Exhibit Hall/Networking 11

12:00 pm - 12:15 pm
Break/Exhibit Hall/Networking 12

1:15 pm - 1:30 pm
Break/Exhibit Hall/Networking 13

THU, SEPTEMBER 16, 2021
7:45 am - 8:00 am
Break/Exhibit Hall/Networking 14

10:00 am - 10:30 am
Break/Exhibit Hall/Networking 15

IEEE IUS 2021 Technical Program

***Note: Session Chairs may be subject to late changes that are not reflected in this program. Please see virtual platform for latest Chairs.**

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-06: ABD: BAW Devices & ASD: SAW Devices (PM)
Session Chair(s): Paul Bradley (Broadcom), Hagen Schmidt (Leibniz Institute for Solid State and Materials Research Dresden)

2:00 PM
4905: High Temperatures BVD Model for AlN-Based Solidly Mounted Resonators
Eduardo Lugo-Hernández{3}, Teona Mirea{1}, José Manuel Carmona Cejas{1}, Marta Clement{2}, Jimena Olivares{2}, Juan Carlos Collado-Goméz{3}, Jordi Mateu{3}
{1}CEMDATIC-ETSI Telecomunicación,Universidad Politécnica de Madrid, Spain; {2}CEMDATIC-ETSI Telecomunicación,Universidad Politécnica de MadridCEMDATIC-ETSI Telecomunicación,Unive, Spain; {3}Universitat Politècnica de Catalunya, Spain

2:10 PM
4959: Comparative Study of Fully-Dielectric Acoustic Reflectors in Solidly Mounted Resonators
José Manuel Carmona Cejas, Teona Mirea, Marta Clement, Jimena Olivares
GMME-CEMDATIC-ETSI de Telecomunicación. Universidad Politécnica de Madrid, Spain

2:20 PM
4982: AlN-Based HBAR Ultrasonic Sensor for Fluid Detection in Microchannels with Multi-Frequency Operation Capability Over the GHz Range
Jesus Yanez, Eyglis Ledesma, Arantxa Uranga, Nuria Barniol
Universitat Autonoma de Barcelona, Spain

2:30 PM
4026: Asymmetry of Acoustic Wave Propagation in Layered Structures
Natalya Naumenko
National University of Science and Technology 'MISIS', Russia

2:40 PM
4452: Effects of the SiO2 Layer on the Performance of a LNOI Acoustic Wave Resonator
Jordi Verdú, Patricia Silveira, Eloi Guerrero, Lluis Acosta, Pedro de Paco
Universitat Autonoma de Barcelona, Spain

2:50 PM
4508: Method to Measure Reflection Coefficient Under CW High-Power Signals in SAW Resonators
Marta González-Rodríguez{3}, Carlos Collado{3}, Jordi Mateu{3}, José María González-Arbesú{2}, Sebastian Huebner{1}, Robert Aigner{1}
{1}Qorvo, United States; {2}Universitat Politècnica de Catalunya (UPC, Spain; {3}Universitat Politècnica de Catalunya (UPC), Spain

3:00 PM
4517: Impact of Thermal Stress on Attachment and Stability of High Temperature Strain Sensors
David Leff, Mauricio Pereira Da Cunha
University of Maine, United States

3:10 PM
4569: Surface Acoustic Wave Enhanced Diffusion in Wavelength-Scale Microchannels
Danli Peng{2}, Wei Tong{2}, David J. Collins{2}, Michael R. Ibbotson{1}, Steven Prawer{2}, Melanie Stamp{2}
{1}National Vision Research Institute, Australian College of Optometry, Carlton, Victoria, Australia, Australia; {2}Univerisity of Melbourne, Australia

3:20 PM
5214: Stabilized Pt Interdigitated Electrodes for High-Temperature SAW Sensors
Arthur De Sousa Lopes Moreira{2}, Ausrine Bartasyte{1}, Djaffar Belharet{1}, Laurent Robert{1}, Valérie Soumann{1}, Samuel Margueron{1}, Andreas Broenner{3}
{1}Femto-St Institute, France; {2}Femto-St Institute, WIKA Alexander Wiegand SE & Co. KG, France; {3}WIKA Alexander Wiegand SE & Co. KG, Germany

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-07: MCA: Nanobubble & Nanodroplet High Resolution Contrast Imaging & Imaging Modes (PM)
Session Chair(s): Parag Chitnis (George Mason University)

2:00 PM
4299: Evaluation of Prostate Cancer Detection Using Contrast Enhanced Ultrasound Imaging with PSMA-Targeted Nanobubbles in a Large Animal Orthotopic Tumor Model
Eric Abenojar{1}, Jing Wang{1}, Wang Yu{1}, Al de Leon{1}, Xinning Wang{1}, Ramamurthy Gopalakrishnan{1}, Sidhartha Tavri{1}, Andy Milkowski{2}, James Basilion{1}, Agata Exner{1}
{1}Case Western Reserve University, United States; {2}Siemens Healthcare, United States

2:10 PM
4528: Increasing Specificity of Drug Delivery to Orthotopic Liver Tumors Using Drug-Loaded Nanobubbles
Pinunta Nittayacharn{1}, Eric Abenojar{1}, Emily Budziszewski{1}, Michael Kolios{2}, Agata Exner{1}
{1}Case Western Reserve University, United States; {2}Ryerson University, Canada

2:20 PM
4770: The Effect of Whole Blood on Nanobubble-Generated Speckle Decorrelation
Michaela Cooley{1}, Dana Wegierak{1}, Michael Kolios{2}, Agata Exner{1}
{1}Case Western Reserve University, United States; {2}Ryerson University, Canada

2:30 PM
4790: Quantitative Imaging of PSMA-Targeted Nanobubbles by Improved Intravascular Modeling
Chuan Chen{2}, Reshani Perera{1}, Michael Kolios{3}, Agata Exner{1}, Massimo Mischi{2}, Simona Turco{2}
{1}Case Western Reserve University, United States; {2}Eindhoven University of Technology, Netherlands; {3}Ryerson University, Canada

2:40 PM
5029: Flow-Independent Microbubble Isolation by Rapid Recondensation of Phase-Change Nanodrops After Acoustic Droplet Vaporization
Mark Burgess{1}, Mitra Aliabouzar{2}, Christian Aguilar{2}, Mario Fabiilli{2}, Jeffrey Ketterling{1}
{1}Riverside Research, United States; {2}University of Michigan, United States

2:50 PM
5427: In Vivo Imaging and Activation of Perfluorohexane Nanodroplets with High-Frequency Ultrasound
Trevor Mitcham, Dmitry Nevozhay, Yunyun Chen, Adam Kulp, Stephen Lai, Konstantin Sokolov, Richard Bouchard
University of Texas MD Anderson Cancer Center, United States

3:00 PM
4046: Software-Based Processing for Contrast-Enhanced Ultrasound Imaging Using Pulse-Inversion Spectral Convolution
Mawia Khairalseed, Ipek Oezdemir, Kenneth Hoyt
University of Texas at Dallas, United States

3:10 PM
4817: Investigation of the Phase of the Fundamental Component of Nonlinear Echoes in Amplitude Modulation
Sara Keller, Ting Yu Lai, Michalakis Averkiou
University of Washington, United States

3:20 PM
4852: In Vivo Pharmacokinetics of Microbubbles: A Direct Blood Characterization Study
Jose Navarro-Becerra, Kang-Ho Song, Mark Borden
University of Colorado Boulder, United States

3:30 PM
4870: Contrast Enhanced Ultrasound with Optimized Aperture Patterns
Ting-Yu Lai, Michalakis Averkiou
University of Washington, United States

3:40 PM
5409: Simulation of Microbubble Displacement and Normalized Singular Spectrum Area Measurements of Microbubble Signals in a Vessel Phantom
Yi Huang, Elizabeth Herbst, John Hossack
University of Virginia, United States

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-08: MEL: New Methods in Elastography (PM)
Session Chair(s): Miguel Bernal (Verasonics, Inc.)

2:00 PM
4114: Improving Wave Transmission in Heterogeneous Materials by Using Multi-Source Acoustic Radiation Force-Induced Optical Coherence Elastography
Hsiao-Chuan Liu{2}, Piotr Kijanka{1}, Hyoung-Ki Lee{2}, Matthew W. Urban{2}
{1}AGH University of Science and Technology, Poland; {2}Mayo Clinic, United States

2:10 PM
4286: A New Plane Wave Compounding Scheme to Reduce the Error in Phase Shift Estimation for Shear Wave Motion Detection
Hyungkyi Lee, James F. Greenleaf, Matthew W. Urban
Mayo clinic, United States

2:20 PM
4915: Investigating ARFI Geometry Effects on Viscoelastic Shearwave Reconstructions
Siladitya Khan, Soumya Goswami, Fan Feng, Stephen McAleavey
University of Rochester, United States

2:30 PM
4921: Non-Diffractive Acoustic Radiation Force Push Sequences for Shear Wave Viscoelastography
Siladitya Khan, Soumya Goswami, Fan Feng, Stephen McAleavey
University of Rochester, United States

2:40 PM
4975: Improving the Multilevel Algorithm for Electrode Displacement Elastography
Robert Pohlman, Tomy Varghese
University of Wisconsin School of Medicine and Public Health, United States

2:50 PM
5007: Combining Physics-Based Modeling and Deep Learning for Ultrasound Elastography
Narges Mohammadi, Marvin Doyley, Mujdat Cetin
University of Rochester, United States

3:00 PM
5041: Shear Wave Speed Ratio for Evaluation of Nonlinearity of Soft Tissues
Soumya Goswami, Siladitya Khan, Fan Feng, Stephen McAleavey
Univesity of Rochester, United States

3:10 PM
5043: Viscoelastic Effect on Nonlinear Shear Modulus: A Simulation Study
Soumya Goswami, Siladitya Khan, Fan Feng, Stephen McAleavey
University of Rochester, United States

3:20 PM
5246: A Comparison Study of Bessel SWEI and Supersonic Shear Imaging: Energy and Contrast Evaluations
Fan Feng, Soumya Goswami, Siladitya Khan, Stephen McAleavey
University of Rochester, United States

3:30 PM
5442: Assessing the Impact of ARF Excitation Beam Width and Tracking Beam Concurrency on DoPIo Imaging Performance in a Calibrated Phantom
Keita Yokoyama, Keerthi Anand, Caterina Gallippi
UNC/NCSU Joint Dpt of Biomedical Engineering, United States

3:40 PM
5452: Shear Wave Speed Estimation for Crawling Wave Sonoelastography Using the Short-Time Fourier Transform
Sebastian Merino, Benjamin Castaneda, Stefano Romero
Pontificia Universidad Catolica del Peru, Peru

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-09: MBE: Microbubbles, LIPUS & Stimulation I (PM)
Session Chair(s): Rifat Ahmed (Duke University)

2:00 PM
4125: Modelling of In Vivo LIPUS Stimulation of Murine Intestinal Wall
Gabriele Baldi{2}, Andrea Cafarelli{2}, Raffaele Bisogno{1}, Stefania Vetrano{1}, Leonardo Ricotti{2}
{1}Humanitas, Italy; {2}Scuola Superiore Sant'Anna, Italy

2:10 PM
4244: Characterization of Second Membrane Perforation by Ultrasound-Driven Single Microbubble
Jianmin Shi{2}, Tao Han{2}, Alfred.C.H Yu{1}, Peng Qin{2}
{1}Schlegel Research Institute for Aging, University of Waterloo, Canada; {2}Shanghai Jiao Tong University, China

2:20 PM
4317: A Feasibility Study of Ultrasound-Assisted Endovascular Laser Thrombolysis
Rohit Singh, Janggun Jo, Xinmai Yang
University of Kansas, United States

2:30 PM
4730: Real-Time Tracking the Long-Term Cell Fate Trend of Different Degree of Sonoporated Cells
Jianmin Shi{3}, Tao Han{3}, Alfred.C.H Yu{2}, Peng Qin{1}
{1}Peng Qin, Associate Professor, Shanghai Jiao Tong University, China, China; {2}Schlegel Research Institute for Aging, University of Waterloo, Canada; {3}Shanghai Jiao Tong University, China

2:40 PM
4731: Spatiotemporal Dynamics of Actin Cytoskeleton in the Sonoporated HUVECs
Caixia Jia{3}, Tao Han{3}, Alfred.C.H Yu{2}, Peng Qin{1}
{1}Peng Qin, Associate Professor, Shanghai Jiao Tong University, China, China; {2}Schlegel Research Institute for Aging, University of Waterloo, Canada; {3}Shanghai Jiao Tong University, China

2:50 PM
5106: Bioeffects of Low-Intensity Continuous Ultrasound (LICUS) on Wound Healing in Corneal Stromal Cells In Vitro
Yilong Zhang, Guan Wang, Kanheng Zhou, Chunhui Li, Zhihong Huang
University of Dundee, United Kingdom

3:00 PM
4986: Transcranial Cavitation Dose Monitoring via Acoustic Cavitation Emissions
Scott Haskell, Jonathan Sukovich, Timothy Hall, Zhen Xu
University of Michigan, United States

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-10: MIM: Functional US & Brain Imaging (PM)
Session Chair(s): Marvin Doyley (University of Rochester)

2:00 PM
4229: Skull Microstructure and Mode Conversion in Transcranial Ultrasound Imaging
Bowen Jing{1}, Matteo Mazzotti{2}, Massimo Ruzzene{2}, Brooks Lindsey{1}
{1}Georgia Institute of Technology, United States; {2}University of Colorado Boulder, United States

2:10 PM
4474: Experimental Demonstration of 3D Transcranial Passive Acoustic Mapping with the Heterogeneous Angular Spectrum Approach
Pradosh Pritam Dash{2}, Scott Schoen Jr{1}, Costas Arvanitis{1}

{1}Georgia Institute of Technology and Emory University, Atlanta, GA, USA, United States; {2}Georgia Institute of Technology, Atlanta, GA, USA, United States

2:20 PM
4482: Impact of Cardiopulmonary Bypass Surgery on Myocardial Perfusion Assessed by Ultrafast Power Doppler: A Human Proof-of-Concept Study
Minh Nguyen, Naiyuan Zhang, Luc Mertens, David Barron, Jérôme Baranger, Olivier Villemain
Hospital for Sick Children, University of Toronto, Canada

2:30 PM
4984: Functional Ultrasound Imaging Reveals Retinotopy and Optogenetic Expression in Ferrets
Wentao Hu{1}, Farran Briggs{2}, Marvin Doyley{1}
{1}University of Rochester, United States; {2}University of Rochester School of Medicine, United States

2:40 PM
5479: Neuronavigation with Skull Segmentation and Acoustic Modeling for Guiding Transcranial Acoustoelectric Brain Imaging
Margaret Allard, Chet Preston, Chaio Huang, Nan-Kuei Chen, Russell Witte
University of Arizona, United States

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-11: MIM: Super-Resolution Imaging I (PM)
Session Chair(s): Pengfei Song (University of Illinois)

2:00 PM
4195: Curvelet Transform-Based Sparsity Promoting (CTSP) Algorithm for Fast Ultrasound Localization Microscopy
Qi You{2}, Joshua D. Trzasko{1}, Matthew Lowerison{2}, Shigao Chen{1}, Pengfei Song{2}
{1}Mayo Clinic, United States; {2}University of Illinois at Urbana-Champaign, United States

2:10 PM
4220: 3-D Super-Resolution Ultrasound Imaging for Monitoring Early Changes in Breast Cancer After Treatment with a Vascular-Disrupting Agent
Ipek Oezdemir, Junjie Li, Jane Song, Kenneth Hoyt
University of Texas at Dallas, United States

2:20 PM
4979: Dual-Modal Photoacoustic/Fast-Super-Resolution-Ultrasound Imaging Accelerated by Sparsity Constraint Optimization
Shensheng Zhao, Bing-Ze Lin, Jonathan Hartanto, Ritin Joseph, Yang Zhao, Yun-Sheng Chen
University of Illinois Urbana-Champaign, United States

2:30 PM
5405: 3D Transcranial Ultrasound Localization Microscopy In Vitro Human Skull with a Sparse 1024-Channel 1.25 MHz Array
Jacob McCall{1}, Francisco Santibanez{3}, Paul Dayton{2}, Gianmarco Pinton{3}
{1}North Carolina State University, UNC Chapel Hill, United States; {2}University of North Carolina at Chapel Hill and North Carolina State University, United States; {3}University of North Carolina Chapel Hill and North Carolina State University, United

2:40 PM
5423: Human Skull Transcranial Super-Harmonic Super-Resolution Ultrasound Imaging
Francisco Santibanez{1}, Jinwook Kim{1}, Gianmarco Pinton{1}, Paul Dayton{2}
{1}University of North Carolina at Chapel Hill, United States; {2}University of North Carolina at Chapel Hill and North Carolina State University, United States

2:50 PM
5424: Point Spread Function Volume Dictates Optimal Microbubble Concentration and Acquisition Time in Ultrasound Localization Microscopy
Hatim Belgharbi{1}, Jonathan Porée{1}, Rafat Damseh{1}, Vincent Perrot{1}, Léo Milecki{1}, Patrick Delafontaine-Martel{1}, Frédéric Lesage{2}, Jean Provost{2}
{1}Polytechnique Montreal, Canada; {2}Polytechnique Montreal, Montreal Heart Institute, Canada

3:00 PM
5455: Tumor Microvascular Imaging with Acoustic Angiography and Super-Resolution Ultrasound Localization Microscopy
Ryan Deruiter{1}, Francisco Santibanez{1}, Thomas Kierski{1}, Gianmarco Pinton{1}, Paul Dayton{2}
{1}Joint Dept. of BME, UNC/NCSU, United States; {2}University of North Carolina at Chapel Hill and North Carolina State University, United States

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Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-12: MPA: Photoacoustic Imaging I (PM)
Session Chair(s): Xueding Wang (University of Michigan), Roger Zemp (University of Alberta)

2:00 PM
4186: Resolving the Anatomy of Aqueous Veins and Perilimbal Sclera Using Multispectral Photoacoustic Imaging
Guan Xu{2}, Linyu Ni{2}, Wei Zhang{3}, John Riesterer{3}, Wonsuk Kim{3}, Yannis Paulus{2}, Xueding Wang{2}, Sayoko Moroi{1}, Alan Argento{3}
{1}Ohio State University Medical Center, United States; {2}University of Michigan - Ann Arbor, United States; {3}University of Michigan - Dearborn, United States

2:10 PM
4287: In Vivo Tracking of Transplanted Stem Cells Using Multimodality Photoacoustic Microscopy, Optical Coherence Tomography, and Fluorescence Imaging
Van Phuc Nguyen{5}, Wen Fan{2}, Tianye Zhu{2}, Wei Qian{3}, Yanxiu Li{5}, Wei Zhang{5}, Bing Liu{4}, Jessica Henry{5}, Songtao Yuan{1}, Xueding Wang{5}, Yannis Paulus{5}
{1}Department of Ophthalmology, The First Affiliated Hospital of Nanjing Medical University, 210029, Ch, United States; {2}First Affiliated Hospital of Nanjing Medical University, China; {3}IMRA America Inc, Ann Arbor, MI 48105, USA, United States; {4}Ngu

2:20 PM
4313: A Brief Analysis of Cavitation Induced Shear and Circumferential Stresses on Blood Vessel Wall During Photo-Mediated Ultrasound Therapy
Rohit Singh, Xinmai Yang
University of Kansas, United States

2:30 PM
4655: Triblock-Peptide-Modified Gold Nanoparticles for In Vivo Tracking of Stem Cell Viability via Molecular Photoacoustic Imaging
Jinhwan Kim, Anamik Jhunjhunwala, Stanislav Emelianov
Georgia Institute of Technology, United States

2:40 PM
4812: An Iterative Spectral Unmixing Method for Spectroscopic Photoacoustic Imaging
Yixuan Wu, Jeeun Kang, Wojciech Lesniak, Martin Pomper, Emad Boctor
Johns Hopkins University, United States

2:50 PM
4840: A Quantitative Guideline for Transcranial Photoacoustic Imaging Based on a Safe and Cost-/Area-Efficient Light Emitting Diode
Jeeun Kang, Raymond Koehler, Peter Gehlbach, Ernest Graham, Emad Boctor
Johns Hopkins University, United States

3:00 PM
4976: Coupled Sub-Aperture and Spatiotemporal Singular Value Decomposition Processing for Cardiac Photoacoustic Imaging In Vivo
Rashid Al Mukaddim, Ashley Weichmann, Carol Mitchell, Tomy Varghese
University of Wisconsin-Madison, United States

3:10 PM
5395: Photoacoustic Reconstruction Method for 3-D Localization of Point Source
Hamid Moradi{1}, Septimiu Salcudean{2}, Emad Boctor{1}
{1}Johns Hopkins University, United States; {2}University of British Columbia, Canada

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-13: MTH: Bioeffects (PM)
Session Chair(s): Emad Ebbini (University of Minnesota)

2:00 PM
4463: A Novel Ultrasound-Triggered Approach to Poloxamer Gelation for Chronic Venous Disease
Davide Costantino Critello{1}, Thomas Matula{2}, Antonino S. Fiorillo{1}
{1}University Magna Graecia of Catanzaro, Italy; {2}University of Washington, United States

2:10 PM
4650: Acoustic Mechanisms for Disrupting Bacterial Aggregates in Synovial Fluid
Neil Zhao{2}, Rachel Evans{2}, Priscilla Machado{2}, Maria Stanczak{2}, John Eisenbrey{2}, Thomas Schaer{1}, Noreen Hickok{2}, Flemming Forsberg{2}
{1}Penn Vet University of Pennsylvania, United States; {2}Thomas Jefferson University, United States

2:20 PM
4767: Micro-Patterning of Acoustic Droplet Vaporization in Acoustically-Responsive Scaffolds Using 3D-Printing Techniques
Mitra Aliabouzar, Oliver Kripfgans, Renny Franceschi, Andrew Putnam, Brendon Baker, Brian Fowlkes, Mario Fabiilli
University of Michigan, United States

2:30 PM
5144: Mixed Focused Ultrasound (FUS) / Fluorescence Imaging Platform for Characterization of the Spatial-Temporal Dynamics of Fus-Evoked Calcium Fluxes in an In-Vitro Human Cell Model
Tom Aubier{2}, Ivan Suarez Castellanos{2}, Magali Perier{2}, Alexandre Carpentier{1}, William Apoutou N'Djin{2}
{1}AP-HP, Pitié-Salpêtrière Hospital, France; {2}LabTAU, INSERM, Centre Léon Bérard, Université Lyon 1, Univ Lyon, France

2:40 PM
5303: Acoustic Response of Perfluorocarbon Droplets in Injectable in Situ Forming PLGA Implant Formulations
Emily Budziszewski, Sierra Cotton, Selva Jeganathan, Agata Exner
Case Western Reserve University, United States

2:50 PM
5325: Spectral Ultrasound Analysis of the Stimulatory Effect of Therapeutic Ultrasound on the Beating Activity of Cultured Cardiomyocytes
Andrew Chen, Aleksandar Jeremic, Vesna Zderic
George Washington University, United States

3:00 PM
5484: Investigating Vascular Effects in a Dorsal Window Chamber Tumour Model with Two-Photon Microscopy and Cavitation Monitoring During Vascular Disruption Therapy
Xiaoxiao Zhao, Carly Pellow, David Goertz
University of Toronto, Canada

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-14: MTH: Drug Delivery (PM)
Session Chair(s): Costas Arvanitis (Georgia Institute of Technology)

2:00 PM
4281: Ultrasound-Triggered Vancomycin Release from Novel Polymeric Spinal Prophylactic Device
Lauren Delaney{2}, Selin Isguven{2}, Quezia Lacerda{2}, Priscilla Machado{2}, Noreen Hickok{2}, Steven Kurtz{1}, Flemming Forsberg{2}
{1}Drexel University, United States; {2}Thomas Jefferson University, United States

2:10 PM
4385: The Serum and CSF Metabolomes After Acoustically-Mediated Blood-Brain Barrier Opening: A Metabolic Investigation
Antoine Presset{1}, Sylvie Bodart{1}, Antoine Lefevre{2}, Anais Millet{1}, Edward Oujagir{1}, Ayache Bouakaz{1}, Patrick Emond{2}, Jean-Michel Escoffre{1}, Lydie Nadal-Desbarats{2}
{1}UMR 1253, iBrain, Université de Tours, Inserm, France; {2}UMR 1253, iBrain, Université de Tours, Inserm, Université de Tours, France

2:20 PM
4691: Towards Subject-Specific Therapy Planning for Non-Invasive Blood Brain Barrier Opening in Mice by Focused Ultrasound
Carl Gross{1}, Torsten Hopp{1}, Saskia Grudzenski-Theis{3}, Stefan Heger{2}, Marc Fatar{3}, Nicole Ruiter{1}
{1}Karlsruhe Institute of Technology, Germany; {2}Mannheim University of Applied Sciences, Germany; {3}University of Heidelberg, Germany

2:30 PM
4950: Therapeutic Ultrasound-Enhanced Transcorneal Drug Delivery for Fungal Keratitis
Claire Allison{1}, Blake Cellum{1}, Bianca Karpinecz{1}, Fadi Nasrallah{2}, Vesna Zderic{1}
{1}George Washington University Department of Biomedical Engineering, United States; {2}Retina Consultants, United States

2:40 PM
4963: Manipulation of the Decrease in Barrier Function of a Cellular Monolayer Using a High-Power Miniature Ultrasonic Transducer
Mihnea Vlad Turcanu{3}, Alexandru Moldovan{3}, Maya Thanou{1}, Inke Näthke{2}, Sandy Cochran{3}
{1}King's College London, United Kingdom; {2}University of Dundee, United Kingdom; {3}University of Glasgow, United Kingdom

2:50 PM
5439: Delivery of Cas9-Encoding Nanoparticles to the Brain with Focused and Theranostic Ultrasound
Robin Ji, Yeh-Hsing Lao, Naoto Yoshniaga, Sarah Cai, Nancy Kwon, Kam Leong, Elisa Konofagou
Columbia University, United States

3:00 PM
5459: Modeling Fluid Transport Associated with Microbubble Induced Deformations of Poroelastic Boundaries: Implications for Drug Delivery
Kevin Kiezun, David Goertz
University of Toronto, Canada

3:10 PM
4708: Quantifying Standing Waves Within the Skull for Ultrasound-Mediated Opening of the Blood-Brain Barrier with a Large Aperture Transducer
Eleanor Martin{3}, Andrew Hurrell{2}, James Choi{1}, Bradley Treeby{3}
{1}Imperial College London, United Kingdom; {2}Precision Acoustics, United Kingdom; {3}University College London, United Kingdom

3:20 PM
4748: Efficient and Homogeneous FUS-Mediated BBB Opening at the Whole Brainstem
Yan Gong, Chih-Yen Chien, Dezhuang Ye, Yimei Yue, Hong Chen
Washington University in St. Louis, United States

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-15: MEL: Vascular Elastography (PM)
Session Chair(s): Mostafa Fatemi (Mayo Clinic)

2:00 PM
4492: Efficient Simulation of Full-Wave Response of Arteries Under Acoustic Radiation Force
Tuhin Roy{2}, Matthew W. Urban{1}, James F. Greenleaf{1}, Murthy N. Guddati{2}
{1}Mayo Clinic, United States; {2}North Carolina State University, United States

2:10 PM
4514: Machine Learning Based Association Between Early Carotid Artery Plaque Presence, Vascular Strain Imaging Features and Traditional Cardiovascular Risk Factors in HIV Infected Individuals
Marie-Helene Roy-Cardinal, Madeleine Durand, Carl Chartrand-Lefebvre, Gilles Soulez, Cécile Tremblay, Guy Cloutier
University of Montreal Hospital, Canada

2:20 PM
4516: 4D Optical Coherence Elastography and Verification of Arterial Shear Wave Elastography with Viscoelastic Spectroscopy in an Ex Vivo Porcine Aorta
Charles Capron{1}, Hsiao-Chuan Liu{1}, Hyoung-Ki Lee{1}, Tuhin Roy{2}, Murthy N. Guddati{2}, Matthew W. Urban{1}
{1}Mayo Clinic, United States; {2}North Carolina State University, United States

2:30 PM
4825: Automatic Classification of Human Carotid Plaque Features, In Vivo, Using Multiple Forms of ARFI Data
Gabriela Torres, Melissa Caughey, Keerthi Anand, Jonathon Homeister, Mark Farber, Caterina Gallippi
University of North Carolina at Chapel Hill, United States

2:40 PM
5070: Multiangle PW Compounding Supports ARFI Variance of Acceleration (VoA) Carotid Plaque Imaging for Integration with Vector Doppler
Keerthi Anand, Caterina Gallippi
University of North Carolina, Chapel Hill and North Carolina State University, United States

2:50 PM
5401: Multi-Parametric Monitoring of Atherosclerotic Plaque Development in WMS-FH-Swine
Paul Kemper, Grigorios Karageorgos, Nirvedh Meshram, Pierre Nauleau, Rachel Weber, Elisa Konofagou
Columbia University, United States

3:00 PM
5426: 4-D Pulse Wave Imaging Validated on Stenotic PVA Phantoms and Carotid Arteries of Atherosclerotic Human Subjects
Nirvedh Meshram, Grigorios Karageorgos, Changhee Lee, Julien Grondin, Rachel Weber, Elisa Konofagou
Columbia University, United States

Sunday, September 12: 2:00 PM - 4:00 PM (Eastern Time)
A1P-16: TMI: Medical Imaging & Therapeutic Transducers (PM)
Session Chair(s): Charles Emery (Ulthera)

2:00 PM
4344: Flexible Ultrasound Transducer Array Concept Scalable to Large Areas: First 128 Element 7 MHz Linear Array
Paul van Neer, Arno Volker, Laurens Peters, Roy Verbeek, Thijs Schrama, Egon Merks-Swolfs, Benoit Quesson, Gerwin Gelinck
TNO Netherlands Organisation for Applied Scientific Research, Netherlands

2:10 PM
4406: Optimizing the Materials of a FUS Transducer Sized for Robotic Delivery
Jack Stevenson, Sandy Cochran, Margaret Lucas
University Of Glasgow, United Kingdom

2:20 PM
4753: Optimization of the Backing Material of a Low Frequency PVDF Detector for Ion Beam Monitoring During Small Animal Proton Irradiation
Julie Lascaud{3}, Rafal Kowalewski{3}, Benjamin Wollant{3}, Henri Carmigniani{4}, Katrin Schnürle{3}, Pratik Dash{4}, Hans-Peter Wieser{3}, Jonathan Bortfeldt{3}, Ronaldo Kalunga{4}, Rémi Rouffaud{2}, Anaïs Gérard{1}, Marie Vidal{1}, Joël Hérault{1}, Domi
{1}Centre Antoine Lacassagne, France; {2}GREMAN UMR 7347 Université de Tours, France; {3}Ludwig-Maximilians Universität München, Germany; {4}Ludwig-Maximilians-Universität München, Germany

2:30 PM
5184: Method of Fabrication for a Densely Packed Therapeutic Ultrasound Array
Greyson Stocker, Jonathan Lundt, Sang Won Choi, Tyler Gerhardson, Jonathan Sukovich, Timothy Hall, Zhen Xu
University of Michigan, United States

2:40 PM
5195: Development and Characterization of a Sparse Ellipsoidal 256 Element Array for Volumetric Ultrasound Imaging
Marc Fournelle{1}, Christian Degel{1}, Anette Jakob{1}, Sjoerd Nooijens{2}, Steffen Weber{1}, Jan D'Hooge{2}, Steffen Tretbar{1}
{1}Fraunhofer IBMT, Germany; {2}KU Leuven, Netherlands

2:50 PM
5264: A 6.0 MHz Fresnel Lens Based Histotripsy Transducer
Jeffrey Woodacre, Matthew Mallay, Jeremy Brown
Dalhousie University, Canada

3:00 PM
5307: High-Power Transducer Array System for the Treatment of Deep Vein Thrombosis
Maryam Dadgar, Kullervo Hynynen
University of Toronto, Canada

3:10 PM
5362: A 10 mm Aperture 8-Element Annular Histotripsy Array
Matthew Mallay, Jeffrey Woodacre, Thomas Landry, Jeremy Brown
Dalhousie University, Canada

3:20 PM
5441: Electrostrictive Row Column Arrays with Apodization and Shielding
Mohammad Rahim Sobhani, Mahyar Ghavami, Afshin Kashani Ilkhechi, Roger Zemp
University of Alberta, Canada

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-06: ABD: BAW Devices & AMR: AM MEMS Resonators (AM)
Session Chair(s): Masanori Ueda (TAIYO YUDEN), Jyrki Kaitila (NA)

5:45 AM
4215: Sc0.15Al0.85N-Based 4 GHz Coupled Bulk Acoustic Resonators (CBAR) and Filters for the Single-Chip Duplexer Solution
Chen Liu, Yao Zhu, Nan Wang, Bangtao Chen
Institute of Microelectrics, ASTAR, Singapore

5:55 AM
4301: Study of 3-GHz-Band Thin-Film Bulk Acoustic Resonator Oscillators for Microfabricated Atomic Clocks
Motoaki Hara{1}, Yuichiro Yano{1}, Shinsuke Hara{1}, Akifumi Kasamatsu{1}, Hiroyuki Ito{2}, Tetsuya Ido{1}
{1}National Institute of Information and Communications Technology, Japan; {2}Tokyo Institute of Technology, Japan

6:05 AM
4442: Transverse Mode Suppression of Thickness Shear Bulk Acoustic Resonators on Lithium Niobate
Ting Wu{2}, Yu-Po Wong{1}, Yi-Wen He{2}, Chuan Peng{2}, Jing-Fu Bao{2}, Ken-Ya Hashimoto{3}
{1}Chiba University, Japan; {2}University of Electronic Science and Technology of China, China; {3}University of Electronic Science and Technology of China/Chiba University, Japan

6:15 AM
5181: A Way to Increase Q of FBARs Using Supporting Columns
Yuanhang Qu, Yang Zou, Chao Gao, Zhiwei Wen, Wenjuan Liu, Yao Cai, Chengliang Sun
Institute of Technological Sciences, Wuhan University, China

6:25 AM
4309: Lithium Niobate Film Based Acoustic Wave Resonator with Arc Shaped Electrodes
Jieyu Liu, Xin Tong, Jie Zhou, Yan Liu, Wenjuan Liu, Yao Cai, Chengliang Sun
WuHan University, China

6:35 AM
4562: Reduced-TCF, High Frequency, Piezoelectric Contour-Mode Resonators with Silicon-on-Nothing
Sagnik Ghosh{2}, Duan Jian Goh{2}, Yul Koh{2}, Jaibir Sharma{2}, Srinivas Merugu{2}, Amit Lal{1}, Eldwin Jiaqiang Ng{2}
{1}Cornell University, United States; {2}Institute of Microelectronics, A-STAR (Agency for Science, Technology and Research), Singapore

6:45 AM
4927: 6 GHz Lithium Niobate MEMS Resonator with Square Spiral Electrodes
Ying Xie, Jie Zhou, Yan Liu, Lei Wang, Zhongye Wu, Yao Cai, Chengliang Sun
Wuhan University, China

6:55 AM
5128: Design and Analysis of Phononic Crystal Reflector for Surface Acoustic Wave Resonator
Kangfu Liu, Yuxi Wang, Tao Wu
ShanghaiTech University, China

7:05 AM
5289: Reflective Grating Array Based Delay Lines in Thin Film Lithium Niobate on Insulator
Siddhartha Ghosh{2}, Siva Yegnanarayanan{1}, Matthew Ricci{1}
{1}MIT Lincoln Laboratory, United States; {2}Northeastern University, United States

7:15 AM
5499: Design and Analysis of High kt² Shear Horizontal Wave Resonators Using LiNbO3 Thin Film
Yushuai Liu, Kangfu Liu, Tao Wu
ShanghaiTech University, China

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-07: MCA: Imaging Modes, Nanodroplet & Therapeutic Applications (AM)
Session Chair(s): Mike Averkiou (University of Washington)

5:45 AM
4148: Noninvasive Fractional Flow Reserve Estimation Based on the Subharmonic Response of SonoVue™
Xiaoyang Qiao{3}, Yu Wen{3}, Ruiyan Zhang{2}, Yujin Zong{3}, Ayache Bouakaz{1}, Mingxi Wan{3}
{1}Université de Tours, France; {2}University of Electronic Science and Technology of China, China; {3}Xi'an Jiaotong University, China

5:55 AM
4509: Rapid Microbubble Size Estimation by Acoustical Camera Exploiting Phase and Amplitude Modulation
Sander Spiekhout{2}, Jason Voorneveld{2}, Benjamin van Elburg{4}, Tim Segers{4}, Michel Versluis{4}, Guillaume Renaud{1}, Martin Verweij{1}, Nico de Jong{2}, Johan G. Bosch{3}
{1}Delft university of technology, Netherlands; {2}Erasmus MC, Netherlands; {3}Erasmus University Medical Center, Netherlands; {4}University of Twente, Netherlands

6:05 AM
4588: SonoVue Microbubbles as Ultrasound Pressure Sensors in a Dynamic Flow Phantom
Cameron Dockerill{2}, Alessandro Faraci{2}, Kirsten Christensen-Jeffries{2}, Jordi Alastruey{2}, Ronak Rajani{1}, Pablo Lamata{2}, Amanda Nio{2}
{1}Guy's and St Thomas' NHS Foundation Trust, United Kingdom; {2}King's College London, United Kingdom

6:15 AM
5294: Doppler Motion Compensation in High-Frame Rate Contrast Enhanced Ultrasound Imaging
João Ribeiro, Matthieu Toulemonde, Kai Riemer, Meng-Xing Tang
Imperial College London, United Kingdom; Imperial College London, Portugal

6:25 AM
4263: Predicting Bubble Nucleation in Acoustic Nanodroplet Vaporization with Modified Classical Nucleation Theory
Dui Qin, Shuang Lei, Qingqin Zou, Wei Wang, Zhangyong Li
Chongqing University of Posts and Telecommunications, China; Chongqing University of Posts and Telecommunications, Chile

6:35 AM
4419: Antagomir-155 Attenuates Acute Cardiac Rejection Using Ultrasound Targeted Microbubbles Destruction
Luyang Yi, Yihan Chen, Qiaofeng Jin, Yuman Li, Yali Yang, Jing Wang, Qing Lv, Li Zhang, Mingxing Xie
Union Hospital, Huazhong University of Science and Technology, China

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Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-08: MBB: Adaptive Beamforming (AM)
Session Chair(s): Hideyuki Hasegawa (University of Toyama)

5:45 AM
4082: Transtemporal Ultrasound Holograms for Thalamic Therapy
Diana Andrés, Noé Jiménez, Francisco Camarena
Universitat Politècnica de València, Spain

5:55 AM
4245: The Effect of Line Density on the Spatial Resolution of Minimum Variance Beamforming and an Efficient Method to Increase Line Density
Jing Liu{2}, Chongchong Guo{2}, Bo Yang{2}, Weibao Qiu{1}
{1}Paul C. Lauterbur Research Center for Biomedical Imaging, Shenzhen Institutes of Advanced Technology, China; {2}Shenzhen Mindray Bio-Medical Electronics Co., Ltd, China

6:05 AM
4929: Improvement of Microbubbles Localization Using Adaptive Beamforming in Super-Resolution Ultrasound Imaging
Reza Tasbaz, Babak Mohammadzadeh Asl
Tarbiat Modares University, Iran

6:15 AM
4993: Adaptive Ultrasound Beamforming Combining Multiplicative Beamforming with Strong Reflectors Separation
Beary Fluss, Zvi Friedman, Moshe Porat
Technion, Israel

6:25 AM
5045: Super-Resolution Ultrasound Imaging with Low Number of Frames Enhanced by Adaptive Beamforming
Reza Tasbaz, Babak Mohammadzadeh Asl
Tarbiat Modares University, Iran

6:35 AM
5048: A Novel Adaptively-Weighted Non-Linear Beamformer for Conventional Focused Beam Ultrasound Imaging Systems: Initial Results
Anudeep Vayyeti, Arun Thittai
IIT Madras, India

6:45 AM
5142: Ultrafast Adaptive Coherence Beamforming Using a Fast but Simple Quad Phase Estimator
Holger Hewener, Steffen Tretbar
Fraunhofer Institute for Biomedical Engineering, Germany

6:55 AM
5227: Ultrasound Matrix Imaging: An Iterative Phase Reversal Process for Aberration Correction
Arthur Le Ber{1}, William Lambert{2}, Flavien Bureau{1}, Arnaud Tourin{1}, Mathias Fink{1}, Alexandre Aubry{1}
{1}Institut Langevin, ESPCI Paris, Université PSL, CNRS, France; {2}Supersonic Imagine, France

7:05 AM
5403: Aberration Correction in Peripheral Edemas Using Paraxial Backpropagation
Hans-Martin Schwab, Richard Lopata
Eindhoven University of Technology, Netherlands

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-09: MBE: Microbubbles, LIPUS & Stimulation II (AM)
Session Chair(s): Diya Wang (Xi'an Jiaotong University)

5:45 AM
4081: Noninvasive and Selective Activation of Neuronal Activity by Piezoelectric MoS2 Nanosheets with Focused Ultrasound
Ching-Hsiang Fan{1}, Chih-Kuang Yeh{2}
{1}National Cheng Kung University, Taiwan; {2}National Tsing Hua University, Taiwan

5:55 AM
4254: Impact of Microbubble Cavitation on the Migration, Viability and Cell Cycle Distribution of Melanoma Cells
Qi Zhang, Dongxin Yang, Ziyan Yuan, Renjie Song, Guangyao Xu, Xiasheng Guo, Juan Tu, Dong Zhang
Nanjing University, China

6:05 AM
4322: Ultrasound Physical Therapy Potentiates Anti-PD-L1 Treatment for Immunologically Cold Tumors via an All-in-One and All-in-Control Strategy
Pengying Wu, Zhen Ya, Shifang Guo, Mingting Zhu, Yan Li, Mingxi Wan
Xi'an Jiaotong University, China

6:15 AM
4330: Nanobubbles Actuated Ultrasound Deep Brain Stimulation
Xuandi Hou, Zhihai Qiu, Shashwait Kala, Quanxiang Xian, Jianing Jing, Jiejun Zhu, Ting Zhu, Kin Fung Wong, Lei Sun
Hong Kong Polytechnic University, China

6:25 AM
4358: Focused Ultrasound Assisted Gene and Sonodynamic Synergistic Therapy for Effectively Inhibiting Glioma by "All-in-One" Nanoplatform
Yan Li{2}, Mingting Zhu{2}, Pengying Wu{2}, Yujin Zong{2}, Ayache Bouakaz{1}, Mingxi Wan{2}
{1}Université de Tours, France; {2}Xi'an Jiaotong University, China

6:35 AM
4580: Enhanced Insulin Secretion by Ultrasound Stimulation via Activation of CFTR in Pancreatic Islet β Cells
Jinghui Guo, Yong Wu, Zhihai Qiu, Xinyi Zhao, Shashwati Kala, Lei Sun
Hong Kong Polytechnic University, Hong Kong

6:45 AM
4632: Low Intensity Pulsed Ultrasound Improves Cognitive Ability in Hind Limb Unloading Mice
Yi Zhong, Wanzhao Wang, Sufang Kang, Lijun Sun
Shaanxi Normal University, China

6:55 AM
4638: LIPUS Improves Intestinal Function in Rats with Exercise-Induced Fatigue
Liping Wu, Yaling Zhou, Yanan Yu, Liang Tang
Shaanxi Normal University, China

7:05 AM
5089: Molecular Mechanism of Ultrasound Neuron Stimulation
Jiejun Zhu, Zhihai Qiu, Jinghui Guo, Shashwati Kala, Quanxiang Xian, Xuandi Hou, Ting Zhu, Lei Sun
Hong Kong Polytechnic University, India; Hong Kong Polytechnic University, China

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Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-10: MIM: Novel Image Analysis (AM)
Session Chair(s): Kang Kim (University of Pittsburgh)

5:45 AM
4040: Impact of Frequency, Bandwidth, Focus, and Angle of Incidence on Lung Ultrasound Vertical Artifacts' Intensity, In-Vitro Study
Federico Mento, Libertario Demi
University of Trento, Italy

5:55 AM
4061: Ultrasonic Monitoring of Microwave Induced Liver Ablation Using Weighted Shannon Entropy
Xiejing Li, Xin Jia, Mengke Wang, Mingxi Wan, Siyuan Zhang
Xi'an Jiaotong University, China

6:05 AM
4133: Validation of Novel Biomarkers to Assess Cardiac Diastolic Function Extracted Using a High Frame Rate Speckle Tracking Algorithm
Konstantina Papangelopoulou{1}, Marta Orlowska{1}, Stéphanie Bézy{1}, Aniela Petrescu{1}, Annegret Werner{1}, Alessandro Ramalli{2}, Jens-Uwe Voigt{1}, Jan D'Hooge{1}
{1}Katholieke Universiteit Leuven, Belgium; {2}University of Florence, Italy

6:15 AM
4332: Ultrafast Ultrasound Imaging for Micro-Nanomotors: A Phantom Study
Shaoyuan Yan, Jinrun Liu, Xingyi Guo, Dean Ta, Yongfeng Mei, Gaoshan Huang, Alexander A. Solovev, Kailiang Xu
Fudan University, China

6:25 AM
4365: Speckle Tracking During Stress Echocardiography Using High Frame Rate Imaging
Marta Orlowska{2}, Alessandro Ramalli{3}, Stéphanie Bézy{1}, Jens-Uwe Voigt{1}, Jan D'Hooge{2}
{1}Katholieke Universiteit Leuven, Belgium; {2}KU Leuven, Belgium; {3}University of Florence, Italy

6:35 AM
4561: Indicating Lung Maturity of Preterm Births on Lus Images Using the GLCM Statistical Properties --- a Pilot Study

Duo Xu{2}, Hongye Zeng{2}, Jiangqin Liu{1}, Shanshan Wang{1}, Rui Zheng{2}
{1}Shanghai First Maternity and Infant Hospital, Tongji University School of Medicine, China; {2}ShanghaiTech University, China

6:45 AM
4918: Spatial Analysis of Preclinical Dynamic Contrast-Enhanced Ultrasound (DCE-US) Images for Assessment of Tumour Response to Radiotherapy
Dana Tahboub, Carol Box, Simon Robinson, Jeff Bamber, Emma Harris
Institute of Cancer Research, United Kingdom

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-11: MBF: Blood Flow Imaging I (AM)
Session Chair(s): Alessandro Ramalli (University of Florence)

5:45 AM
4095: Intravascular Pressure Gradient Estimation Using Synthetic Aperture Ultrasound
Lars Emil Haslund, Shamal Surain Kurukuladithya, Malmindi Ariyasinghe, Matthias Bo Stuart, Marie Sand Traberg, Jørgen Arendt Jensen
Center for Fast Ultrasound Imaging, Denmark

5:55 AM
4200: The Effect of Spatial Velocity Gradients on Block Matching Accuracy
Jason Voorneveld{1}, Antonius van der Steen{1}, Johan G. Bosch{2}
{1}Erasmus MC, Netherlands; {2}Erasmus University Medical Center, Netherlands

6:05 AM
4294: Row-Column Tensor Velocity Estimation on CFD Simulated Carotid Bifurcation Flow
Lasse Thurmann Jørgensen, Matthias Bo Stuart, Marie Sand Traberg, Jørgen Arendt Jensen
Center for Fast Ultrasound Imaging, DTU Health Technology, Denmark

6:15 AM
4630: Comparison of Contrast-Enhanced Ultrasound Parameters for Classification of Anti-Angiogenic Tumor Treatment Response
Mahsa Bataghva, Danielle Johnston, Nicholas Power, Aaron Ward, Silvia Penuela, James Lacefield
Western University, Canada

6:25 AM
5122: Performance Evaluation of Compound Speckle Tracking Based Velocity Estimation Using Cascaded Dual-Polarity Waves
Joosje de Bakker, Stein Fekkes, Chris de Korte, Anne Saris
Radboud University Medical Center, Netherlands

6:35 AM
4437: Automatic Classification of Arterial and Venous Flow in Ultrasound Super-Resolution Images of Rat Kidneys
Iman Taghavi{3}, Sofie Bech Andersen{4}, Carlos Armando Villagómez Hoyos{1}, Fredrik Gran{1}, Charlotte Mehlin Sørensen{4}, Michael Bachmann Nielsen{2}, Matthias Bo Stuart{3}, Jørgen Arendt Jensen{3}
{1}BK Medical, Denmark; {2}Rigshospitalet, Denmark; {3}Technical University of Denmark (DTU), Denmark; {4}University of Copenhagen, Denmark

6:45 AM
4848: Localization of High-Concentration Microbubbles for Ultrasound Localization Microscopy by Self-Supervised Deep Learning
Yongshuai Li{2}, Lijie Huang{2}, Jingke Zhang{2}, Chengwu Huang{1}, Shigao Chen{1}, Jianwen Luo{2}
{1}Mayo Clinic College of Medicine and Science, United States; {2}Tsinghua University, China

6:55 AM
4999: Relationship Between Blood Flow and Vascular Structure at Hippocampal Level Is Revealed by Correlating Ultrafast Ultrasound Doppler and Confocal Microscopy
Maximiliano Anzíbar{2}, Mariana Martínez{3}, Lucía Vázquez{3}, Miguel Calero{1}, Mickael Tanter{4}, Carlos Negreira{2}, Nicolás Rubido{2}, Alejandra Kun{3}, Javier Brum{2}
{1}Chronic Disease Programme (UFIEC), Instituto de Salud Carlos III, CIBERNED, Spain; {2}Instituto de Física, Facultad de Ciencias, Universidad de la República, Uruguay; {3}Lab Biología Celular del Sistema Nervioso Periférico, IIBCE-Facultad de Ciencias-U

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-12: MPA: Photoacoustic Imaging II (AM)
Session Chair(s): Mohammad Mehrmohammadi (Wayne State University), Muyinatu Bell (Johns Hopkins University)

5:45 AM
4027: Ultrathin Fibre-Optic Probe for Simultaneous Photoacoustic and Fluorescence Endoscopy
Tianrui Zhao, Sebastien Ourselin, Tom Vercauteren, Wenfeng Xia
King's College London, United Kingdom

5:55 AM
5092: Axial Resolution Improvement of Optical Resolution Photoacoustic Microscopy with Frequency Domain Delay Multiply and Sum Signal Synthesis Method
Sing-Shuo Su{3}, Che-Chou Shen{2}, Kwok-Ho Lam{1}, Meng-Lin Li{3}
{1}Hong Kong Polytechnic University, Hong Kong; {2}National Taiwan University of Science and Technology, Taiwan; {3}National Tsing Hua University, Taiwan

6:05 AM
5140: Finite Transducer Size Compensation in Two-Dimensional Photoacoustic Computed Tomography
Soheil Hakakzadeh{3}, Moein Mozaffarzadeh{1}, Seyed Masood Mostafavi{3}, Mohammadreza Amjadian{3}, Zahra Kavehvash{3}, Martin Verweij{1}, Nico de Jong{2}
{1}Delft University of Technology, Netherlands; {2}Delft University of Technology and Erasmus MC, Netherlands; {3}Sharif University of Technology, Iran
6:15 AM
5334: A Multi-Aperture Encoding Scheme for Increased SNR in Photoacoustic Imaging
Amir Gholampour, Hans-Martin Schwab, Marc van Sambeek, Min Wu, Richard Lopata
Eindhoven University of Technology, Netherlands

6:25 AM
5415: Towards 3D Photoacoustic Volume Imaging in Patients: An Explorative Study
Roy van Hees, Min Wu, Frans van de Vosse, Richard Lopata, Marcel Rutten
University of Technology Eindhoven, Netherlands

6:35 AM
4414: Myocardial Infracted Border Definition with Dual-Wavelength Photoacoustic Analysis
Shiying Wu{2}, Kangmu Ma{1}, Mengjiao Zhang{2}, Weiya Xie{2}, Qian Cheng{2}
{1}Ruijin Hospital, China; {2}Tongji University, China

6:45 AM
4415: Multi-Wavelength Photoacoustic Time-Frequency Spectral Analysis for Bone Assessment
Weiya Xie{4}, Ting Feng{2}, Dong Yu{4}, Dean Ta{1}, Liming Cheng{3}, Qian Cheng{4}
{1}Fudan University, China; {2}Nanjing University of Science and Technology, China; {3}Tongji Hospital, China; {4}Tongji University, China

6:55 AM
4416: Multi-Wavelength Photoacoustic Spectral Identification of Non-Melanoma Skin Cancers
Mengjiao Zhang{2}, Chu Zhou{1}, Shiying Wu{2}, Xiuli Wang{1}, Qian Cheng{2}
{1}Shanghai Skin Disease Hospital, China; {2}Tongji University, China

7:05 AM
5110: Bone Assessment Using Photoacoustic Temporal Profile Analysis
Ting Feng{3}, Yejing Xie{2}, Weiya Xie{4}, Dong Yu{4}, Yihan Zhu{2}, Chengcheng Liu{1}, Dean Ta{1}, Qian Cheng{5}
{1}Fudan University, China; {2}Nanjing University of Science and Technology, China; {3}Nanjing University of Science and Technology,Tongji University, China; {4}Tongji University, China; {5}Tongji University,Tongji University School of Medicine, China

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-13: MTH: Bioeffects & Plane Waves & Contrast Agents (AM)
Session Chair(s): Weibao Qiu (Shenzhen Institute of Advanced Technology)

5:45 AM
4117: Low-Intensity Pulse Ultrasound Enhances the Differentiation of Mouse Motor Neuron Cells
Thi-Thuyet Truong, Wen-Tai Chiu, Chih-Chung Huang
National Cheng Kung University, Taiwan

5:55 AM
4420: Preparation and Efficacy Evaluation of Ultrasound-Responsive Biomimetic Superhydrophobic Drug-Loaded Mesoporous Silica
Dandan Chen, Qinfeng Jin, Yihan Chen, Tianshu Liu, Jing Wang, Mingxing Xie
Huazhong University of Science Technology, China

6:05 AM
4674: Ultrasound-Induced Microbubble Cavitation for the Treatment of Heavily Calcified Lesions
Chieh-Yu Tsai{1}, Chun-Yen Lai{1}, Zong-Han Hsieh{1}, Jen-Kuang Lee{2}, Chih-Kuang Yeh{1}
{1}Biomedical Engineering and Environmental Sciences, National Tsing Hua University, Taiwan; {2}Cardiology, Department of Internal Medicine, National Taiwan University Hospital, Taiwan

6:15 AM
4689: Ultrasound-Mediated Phase-Shift Nanodroplets Destruction and Removal of Root Canal Biofilm
Jie Dang{2}, Mengqian Zhu{3}, Ruoqing Zhong{3}, Feihong Dong{2}, Wenyu Guo{2}, Yinglong Li{1}, Jue Zhang{2}, Jie Pan{3}
{1}Beijing ChaoYang Hospital, China; {2}Peking University, China; {3}Peking University School and Hospital of Stomatology, China

6:25 AM
4116: Non-Contact Ultrasound Modulates Ca2+-Dependent Transcription Factors and Cell Migration
Hsiao-Fan Cheng, Yi-Shyun Lai, Wen-Tai Chiu, Chih-Chung Huang
National Cheng Kung University, Taiwan

6:35 AM
4362: Singular Value Decomposition Filtering for High Frame Rate Speckle Tracking Echocardiography
Marta Orlowska{2}, Alessandro Ramalli{3}, Stéphanie Bézy{1}, Jens-Uwe Voigt{1}, Jan D'Hooge{2}
{1}Katholieke Universiteit Leuven, Belgium; {2}KU Leuven, Belgium; {3}University of Florence, Italy

6:45 AM
4665: Deep Learning Based Angular Compounding for Accelerated Plane Wave Ultrasound Imaging
Hannah Strohm{1}, Sven Rothlübbers{1}, Jürgen Jenne{1}, Matthias Günther{2}
{1}Fraunhofer Institute for Digital Medicine MEVIS, Germany; {2}Fraunhofer Institute for Digital Medicine MEVIS, University of Bremen, mediri GmbH, Germany

6:55 AM
4726: 4D Ultrafast Blood Flow Imaging Comparison: Vector Doppler, Transverse Oscillation and Speckle Tracking
Raphaël Dumas{1}, Kai Riemer{2}, Matthieu Toulemonde{2}, Marcelo Lerendegui{2}, Peter D. Weinberg{2}, Meng-Xing Tang{2}, François Varray{1}
{1}Creatis, France; {2}Imperial College London, United Kingdom

7:05 AM
4936: Robust PCA-Based Clutter Filtering Method for Super-Resolution Ultrasound Localization Microscopy
Kailiang Xu{2}, Xingyi Guo{2}, Yihui Sui{1}, Vincent Hingot{3}, Olivier Couture{3}, Dean Ta{2}, Weiqi Wang{2}
{1}Academy for Engineering and Technology, Fudan University, China; {2}Center for Biomedical Engineering, School of Information Science and Technology, Fudan University, China; {3}Sorbonne Université, CNRS, INSERM, Laboratoire d'Imagerie Biomedicale, Fran

7:15 AM
5052: Compressed Sensing Framework for Limited-Element Compounded Diverging Waves: Initial Results
Anand Ramkumar, Arun Thittai
IIT Madras, India

7:25 AM
5173: Structural Fidelity Enhanced Plane Wave Compounding Using a Model-Based Deep Neural Network
Nishith Chennakeshava{1}, Ben Luijten{1}, Yonina C. Eldar{2}, Massimo Mischi{1}, Ruud van Sloun{1}
{1}Eindhoven University of Technology, Netherlands; {2}Weizmann Institute of Science, Israel

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Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-14: MTN: Theranostic Imaging & Mapping (AM)
Session Chair(s): Julianna Simon (Pennsylvania State University)

5:45 AM
4096: Passive Cavitation Mapping with Fast Computation and Reduced Artifacts Utilizing Sparse Matrix Beamforming and Apodization Correlation
Shukuan Lu, Yan Zhao, Lei Zhang, Diya Wang, Mingxi Wan
Xi'an Jiaotong University, China

5:55 AM
4193: Mutual Convolution of Dual Modes to Enhance Passive Acoustic Mapping for High Duty-Cycle HIFU Exposures Monitoring
Chunqi Li, Harry R. Clegg, Thomas M. Carpenter, Luzhen Nie, David M. J. Cowell, Steven Freear, James R. McLaughlan
School of Electronic and Electrical Engineering, University of Leeds, United Kingdom

6:05 AM
4486: Visualization of Thermal Ablation Using Pulsed Magneto-Motive Ultrasound Imaging with an Implanting Magnetic Particle
Tiemei Chen, Zhaoke Pi, Ge Ding, Mian Chen, Xiangwei Lin, Haoming Lin, Xin Chen, Siping Chen
Shenzhen university, China

6:15 AM
4592: Proof of Concept for Detection of Guidewire Tip Emitting Ultrasound by Learning from Grating Lobe
Tomohiko Tanaka, Hirozumi Takeshima
FUJIFILM Healthcare Corporation, Japan

6:25 AM
4676: Strategy in Passively Reconstructing and Correcting Transcranial Focal Beam via Dual-Mode Ultrasound Phased Array System
Hsiang-Ching Lin{2}, Chih-Kuang Yeh{2}, Hao-Li Liu{1}
{1}National Taiwan University, Taiwan; {2}National Tsing Hua University, Taiwan

6:35 AM
5240: Ultrasound Skull Imaging for Guiding Noninvasive Ultrasound Brain Therapy in Rodent
Guofeng Li{1}, Zhiqiang Zhang{2}, Rong Liu{2}, Huailing Zhang{1}, Hairong Zheng{2}, Weibao Qiu{2}
{1}Guangdong Medical University, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

6:45 AM
5477: Thermo-Mechanical Monitoring of Therapeutic Focused Ultrasound with Coaxial Ultrasound Imaging Configuration
Mengxuan Wang{2}, Yijia Liu{2}, Miaomiao Zhang{1}, Qiong He{3}, Nisi Zhang{2}, Jianwen Luo{3}, Zhifei Dai{2}
{1}Capital Normal University, China; {2}Peking University, China; {3}Tsinghua University, China

6:55 AM
4275: Ultrasound Imaging-Guided Cavitation Enhanced Photothermal Therapy with High Efficient Multifunctional Nanodroplets
Dui Qin{2}, Lei Zhang{2}, Junjie Chen{2}, Hongrui Zhu{2}, Zhezhu Nan{2}, Daocheng Wu{2}, Ayache Bouakaz{1}, Mingxi Wan{2}, Yi Feng{2}
{1}Université de Tours, INSERM, iBrain, France; {2}Xi'an Jiaotong University, China

7:05 AM
4926: Super-Resolution Passive Cavitation Mapping with Diagnostic Ultrasound Arrays: A Preliminary Study
Shukuan Lu, Yan Zhao, Mingxi Wan
Xi'an Jiaotong University, China

7:15 AM
4762: Characterizing Liver Carcinoma Ablation with Nanosecond Pulsed Electric Field Using Ultrasound and Contrast Enhanced Ultrasound
Jingqi Liu, Tian'An Jiang
First Affiliated Hospital, College of Medicine, Zhejiang University, China

7:25 AM
5061: In Vivo Transcranial Ultrasound Focus Localization Based on Under Sampled MR-ARFI
Yangzi Qiao{2}, Yanbin Li{1}, Qingpu Leng{2}, Hui Zhou{2}, Xiaojing Long{2}, Jo Lee{2}, Yadong Chen{1}, Xin Liu{2}, Hairong Zheng{2}, Chao Zou{2}
{1}College of Medicine and Biological Information Engineering, Northeastern University, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

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Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-15: MEL: Cardiovascular Elastography I (AM)
Session Chair(s): Hendrik Hansen (Radboud University Medical Center)

5:45 AM
4253: Phase Velocity Estimation with Singular Value Decomposition and Phase Shift Tracking for Robust Pulse Wave Analysis
Dan Ran, Wei-Ning Lee
University of Hong Kong, China

5:55 AM
4289: Improving Cardiac Strain Imaging by Compounding Multi-Probe Axial Displacements Based on Unit Axial Vectors
Peilu Liu, Jan-Willem Muller, Hans-Martin Schwab, Richard Lopata
Eindhoven University of Technology, Netherlands

6:05 AM
4375: Transmural Shear Wave Speed Gradient Distinguishes Changes in Myocardial Properties from Changes in Hemodynamic Loading
Annette Caenen{1}, Patrick Segers{1}, Jan D'Hooge{2}
{1}Ghent University, Belgium; {2}KULeuven, Belgium

6:15 AM
4456: A Weighted Line-Focused Beam with Coded Imaging for In Vivo Strain-Stiffness Relationships of Human Carotid Arteries
Yahua Wang, Yang Zhang, Wei-Ning Lee
University of Hong Kong, Hong Kong

6:25 AM
4596: The Variation of Natural Myocardial Mechanical Wave Velocities Due to 3D Propagation
Mohammad Mohajery{2}, Morten Smedsrud Wigen{1}, Solveig Fadnes{2}, David Pasdeloup{2}, Erik Smistad{2}, Torvald Espeland{2}, Sebastien Salles{2}, Lasse Løvstakken{1}
{1}Norwegian University of Science and Technology, Norway; {2}NTNU, Norway

6:35 AM
5219: Importance of Compensation of Delay Time in Pressure Measurement for Accuracy Verification System in Ultrasonic Elasticity Measurement of Artery Wall
Saki Suzuki, Shohei Mori, Mototaka Arakawa, Hiroshi Kanai
Tohoku University, Japan

6:45 AM
5239: Noninvasive In Vivo Left-Ventricular Pressure Estimation by Ultrasound: Preliminary Results
Yue Xu, Yahua Wang, Wei-Ning Lee
University of Hong Kong, China

6:55 AM
5317: In Silico Analysis of Different Methodologies for Estimating Cardiac Shear Wave Speed
Ekaterina Seliverstova{1}, Annette Caenen{2}, Sjoerd Nooijens{1}, Jan D'Hooge{1}
{1}KU Leuven, Belgium; {2}KU Leuven / Ghent University, Belgium

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Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-16: MSD: Ultrasound Devices for Enhanced Therapy & Novel Imaging System (AM)
Session Chair(s): Jin Ho Chang (Daegu Gyeongbuk Institute of Science & Technology), John Hossack (University of Virginia)

5:45 AM
4250: Attempt Toward Medication Adherence Using Acoustically Stimulated Electromagnetic Method
Nobuto Kaitoh, Kenji Ikushima
Tokyo University of Agriculture and Technology, Japan

5:55 AM
4501: -6 dB Focus-Steering Region of a Fully-Electronically Planar HIFU Phased Array: A Preliminary Experimental Evaluation
Xiangda Wang{2}, Jia Guo{2}, Ping Li{2}, Yan Yang{3}, Shiguo Teng{2}, Weijun Lin{1}, Jianlin Li{2}
{1}Institute of Acoustics, Chinese Academy of Sciences, China; {2}Ruyuan Yao Autonomous Dongyangguang Industrial Development Co., Ltd, China; {3}YouJiang Medical University for Nationalities, China

6:05 AM
5373: A Study Using Magnetomotive Ultrasound Imaging Systems to Localize and Guide Magnetic Hyperthermia Treatment Synchronously
Zhaoke Pi, Tiemei Chen, Mian Chen, Siping Chen, Xin Chen
Shenzhen University, China

6:15 AM
4243: Implementing Minimum Variance Beamforming on a GPU-Based Commercial Scanner for Tendon Imaging
Jing Liu{3}, Zebing Wang{3}, Weicheng Chen{3}, Chongchong Guo{3}, Bo Yang{2}, Weibao Qiu{1}
{1}Paul C. Lauterbur Research Center for Biomedical Imaging, Shenzhen Institutes of Advanced Technology, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China; {3}Shenzhen Mindray Bio-Medical Electronics Co., Ltd, China

6:25 AM
4436: A Multimodal Point-of-Care Ultrasound Scanner for Radial Artery Assessment: System Concept
Marcin Lewandowski, Damian Cacko, Piotr Jarosik, Piotr Karwat, Ziemowit Klimonda, Mateusz Walczak, Beata Witek
us4us Ltd., Poland

6:35 AM
4454: Integration of Ultrasound Research System with AI Workstation NVIDIA Clara AGX
Marcin Lewandowski{3}, Piotr Jarosik{3}, Mateusz Walczak{3}, Sean Huver{1}, Bernd Weber{2}, Mathias Blake{2}, Ian Stewart{2}
{1}Nvidia Corporation, United States; {2}Nvidia Corportation, United States; {3}us4us Ltd., Poland

6:45 AM
4461: Intravascular Ultrasound (IVUS) Imaging Using a Distal Rotary Ultrasonic Micromotor
Boquan Wang, Yuchen Wang, Zhiyi Wen, Teng Cao, Liyuan He, Xiaoniu Li, Dawei Wu
Nanjing University Of Aeronautics And Astronautics, China

6:55 AM
4590: Development of a Point-of-Care Ultrasound Driver for Applications with Low Power and Reduced Area Requirements
Bartas Abaravicius{2}, Alexandru Moldovan{2}, Sandy Cochran{2}, Srinjoy Mitra{1}
{1}University of Edinburgh, United Kingdom; {2}University of Glasgow, United Kingdom

7:05 AM
4868: Towards an Open, Flexible, Wearable Ultrasound Probe for Musculoskeletal Monitoring
Sergei Vostrikov{1}, Andrea Cossettini{1}, Christian Vogt{1}, Christoph Leitner{3}, Michele Magno{1}, Luca Benini{2}
{1}ETH Zurich, Switzerland; {2}ETH Zurich, University of Bologna, Switzerland; {3}Graz University of Technology, Austria

7:15 AM
4909: Single Sensor Interventional All-Optical Ultrasound Imaging: Beam Characteristics and Bandwidth Performance
Robert Stafford-Williams, Manish K. Tiwari, Adrien Emmanuel Desjardins, Erwin Jozef Alles
University College London, United Kingdom

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-17: TMI: Medical Imaging/Therapy Transducers & Electronics (AM)
Session Chair(s): Koko Lam (The Hong Kong Polytechnic University)

5:45 AM
4173: Phased Array Based on Novel PZN-PT Single Crystals
Chunxiao Zou, Shilin Hou, Yi Li, Zhengrui Liu, Hu Tang, Siping Chen, Jue Peng
Shenzhen University, China

5:55 AM
4260: Multimode Excitation by a Double-Parabolic-Reflectors Ultrasonic Transducer (DPLUS) with Hard Type Piezoelectric Materials
Kang Chen{4}, Takasuke Irie{1}, Takashi Iijima{3}, Takashi Kasashima{2}, Kota Yokoyama{2}, Susumu Miyake{4}, Takeshi Morita{4}
{1}Microsonic Co., Ltd., Japan; {2}NGK Spark Plug Co., Ltd., Japan; {3}Tokyo University of Science, Japan; {4}University of Tokyo, Japan

6:05 AM
4266: Quasi-Monopolar Ultrasound Pulse by Stack-Layer Dual-Frequency Ultrasound Transducer
Yiqi Cai, Shuqi Song, Lijun Xu, Jianguo Ma
Beihang University, China

6:15 AM
4355: A Novel Low-Power Ultra-Compact Ultrasonic Communication System for Neural Spike Events Recording
Qichao Ma, Yinxiao Feng, Kaisheng Ma
Tsinghua University, China

6:25 AM
4449: The Impact of the Transmission Pulse Shape in Ultrasound Harmonic Imaging
Meiyi Zhou, Peiran Chen, Massimo Mischi, Eugenio Cantatore, Pieter Harpe
Eindhoven University of Technology, Netherlands

6:35 AM
4483: An Open-Source, Low-Cost, Ultrasound Tomography Research System
Morgan Roberts, Eleanor Martin, Michael Brown, Ben Cox, Bradley Treeby
University College London, United Kingdom

6:45 AM
4559: Fundamental Characteristics of Tube-Type Double-Parabolic-Reflectors Ultrasonic Transducer (Tube-Type DPLUS)
Kyohei Yamada{3}, Kang Chen{3}, Takasuke Irie{1}, Takashi Iijima{2}, Susumu Miyake{3}, Takeshi Morita{3}
{1}Microsonic Co., Ltd., Japan; {2}Tokyo University of Science, Japan; {3}University of Tokyo, Japan

6:55 AM
4574: A Novel Small f-Number Ultrasound Transducer with a Double-Focus Structure
Xiao Zhang, Zhoumo Zeng, Hui Zhang, Zhuochen Wang
TianJin University, China

7:05 AM
4587: An Integrate Ultrasound System for Intravascular Acoustic Radiation Force Impulse Imaging
Can Yu, Lei Ye, Junjie Wang, Xin Xiao, Jian Li, Hui Zhang, Zhuochen Wang
Tianjin University, China

7:15 AM
5025: A Focused Annular Ultrasound Transducer Design Based on a Planar Lens
Wei Li, Xiao Zhang, Zhoumo Zeng, Zhuochen Wang
Tianjin University, China

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-18: NSH: Structural Health Monitoring & NSP: Signal Processing (AM)
Session Chair(s): Paul Wilcox (University of Bristol), Yufeng Lu (Bradley University)

5:45 AM
4211: Ultrasonic Ranging Using Frequency Selective Attenuation
Riccardo Carotenuto, Demetrio Iero, Fortunato Pezzimenti, Francesco Giuseppe Della Corte, Massimo Merenda
Università Mediterranea di Reggio Calabria, Italy

5:55 AM
4413: A High-Speed Full-Matrix Capture System for the Assessment of Wind Turbine Tower Sections Welds: Feasibility Study
Marcin Lewandowski, Jakub Rozbicki, Mateusz Walczak, Beata Witek
us4us Ltd., Poland

6:05 AM
4418: Direct Identification of Elasticity from Attenuated Spectrum in Resonant Ultrasound Spectroscopy
Fei Shen, Fan Fan, Rui Wang, Yue Wang, Qiong Wu, Haijun Niu
Beihang University, China

6:15 AM
4460: Bayesian-Based Resonance Ultrasound Spectroscopy with Particle Swarm Optimization
Fei Shen, Fan Fan, Rui Wang, Yue Wang, Qiong Wu, Pascal Laugier, Haijun Niu
Beihang University, China

6:25 AM
4505: Sensor Liftoff Effect Correction for Ultrasonic Pulse-Echo Imaging
Thilo Brill{2}, Melissa Merhej{1}, Hiroshi Hori{2}, Jean-Luc Le Calvez{2}, Daniel Quesada{2}, Chiara Bonomi{2}, Exequiel Padin{2}, Mathieu Tarrius{2}, Sofiane Ellouz{2}, Alexis Carreira{2}
{1}Air Liquide, France; {2}Schlumberger, France

6:35 AM
4521: Differential Time of Arrival Estimation by Processing the Highest Magnitude Spectral Components of Impact's Generated Ultrasonic Guided Waves
Lorenzo Capineri, Andrea Bulletti
Università degli Studi di Firenze, Italy

6:45 AM
4685: Vacuum Leak Location on a High Stiffener Structure Based on a 64-Element Ultrasonic Sensor Array
Xiaobo Rui, Lixin Xu, Yu Zhang, Lei Qi, Ningbo Shi
Tianjin University, China

6:55 AM
4713: A Fast and Low-Cost "Mouse" for Analyzing the Bonding State of Wall Coverings
Giosue Caliano
University Roma Tre, Italy

7:05 AM
4917: Research on Guided Wave Signal Processing Method for Wing Icing Quantitative Detection Based on Wavelet Packet Decomposition-Singular Value
Minghua Zhao, Shiyuan Zhou, Quanpeng Yu, Xiaodan Hu, Xiaoying Sun
School of Mechanics and Vehicles, Beijing Institute of Technology, China

7:15 AM
5489: Plane Wave Imaging of Concrete Using Phased Array Ultrasonic Technique - a Numerical Study
Suhaib Reyaz, Surendra Beniwal
Indian Institute of Technology, Jammu, India

7:25 AM
5511: Bolted Joint Torque Monitoring Using Nonlinear Ultrasonic Lamb Wave Mixing
Juan Carlos Pineda Allen, Ching Tai Ng
University of Adelaide, Australia

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-19: MIS: Heart, Lung, Thyroid, & Tongue (AM)
Session Chair(s): Jonathan Mamou (Riverside Research), Libertario Demi (University of Trento)

5:45 AM
4100: Analysis of Infant Tongue Movement During Breastfeeding in Ultrasound Videos
Yannyk Bourquin, Ludovica Micaroni, Lucja Segaar, Lili-Marjan Boelens-Brockhuis
Philips Research, Netherlands

5:55 AM
4333: A Cascaded CNN Model for Automated Lung Ultrasound Scoring of COVID-19 Pneumonia
Wenyu Xing{2}, Jiangang Chen{1}, Xin Liu{2}, Dean Ta{2}
{1}East China Normal University, China; {2}Fudan University, China

6:05 AM
4340: Assessment of Pleural Diseases Using Sub-Sampled Ultrasound Channel Data
Israel Aharony{1}, Alon Mamistvalov{2}, Leonid Chervinsky{1}, Noga Shabshin{1}, Yonina C. Eldar{2}
{1}Haemek Medical Center, Israel; {2}Weizmann Institute of Science, Israel

6:15 AM
4396: The Application of Tongue Motion Ultrasound in Speech Synthesis Using Deep Learning
Fengji Li, Chenxiao Huang, Shaochuan Zhang, Haijun Niu
Beihang University, China

6:25 AM
4409: Real-Time Image Guiding in Echocardiography Using Deep Learning
David Pasdeloup{2}, Sindre Hellum Olaisen{2}, Andreas Østvik{2}, Espen Holte{2}, Bjørnar Grenne{2}, Sigbjørn Sæbo{2}, Erik Smistad{2}, Håvard Dalen{2}, Lasse Løvstakken{1}
{1}Norwegian University of Science and Technology, Norway; {2}NTNU, Norway

6:35 AM
4471: Lowering the Computational Load of High Frame Rate 2-D Vector Flow Imaging
Stefano Rossi, Piero Tortoli, Alessandro Ramalli
University of Florence, Italy

6:45 AM
4727: Double-Stage Least-Squares Regularisation for 3D Velocity Estimation: A Simulation Study
Raphaël Dumas{1}, Sébastien Salles{2}, François Varray{1}
{1}Creatis, France; {2}Laboratoire d'Imagerie Biomédicale, France

6:55 AM
4924: An Adaptive Estimation of Ultrasound Transit Time-Based Local PWV in Carotid Artery Using Particle Swarm Optimization Algorithm
Li Deng{2}, Yufeng Zhang{2}, Zhiyao Li{1}, Keyan Wu{2}
{1}Third Affiliated Hospital of Kunming Medical University, China; {2}Yunnan University, China

7:05 AM
5016: Data Augmentation of Thyroid Ultrasound Images Using Generative Adversarial Network
Junzhao Liang, Junying Chen
South China University of Technology, China

7:15 AM
5050: Disease Adaptation in Carotid Ultrasound Images of Atherosclerosis Using CycleGAN
Hazrat Ali, Ulf Näslund, Christer Grönlund
Umea University, Sweden

7:25 AM
5086: Thyroid Lymph Node Metastasis Prediction Based on Ultrasound Image Using Missing Value Imputation and Transfer Learning Network
Wenxin Jiang{2}, Xiaotong Chen{2}, Ning Lv{2}, Miao Yao{2}, Yanyan Yu{3}, Weibao Qiu{2}, Jianming Li{1}
{1}Beijing Friendship Hospital, China; {2}Shenzhen Institutes of Advanced Technology, China; {3}Shenzhen University, China

7:35 AM
5098: Large Field-of-View Ultrafast 3D Ultrasound Imaging of Abdominal Aorta Mimicking Phantoms
Larissa Jansen, Peilu Liu, Sarah van Meel, Hans-Martin Schwab, Richard Lopata
Eindhoven University of Technology, Netherlands

Monday, September 13: 5:45 AM - 7:45 AM (Eastern Time)
B1P-20: ASD: SAW Devices II (AM)
Session Chair(s): Jan Kuypers (MEMS2market), Natalya Naumenko (National University of Science and Technology)

5:45 AM
4210: Shear Horizontal Surface Acoustic Waves Assisted Gold Nanoparticles for a Highly Tunable Localized Surface Plasmon Resonance Spectrum
Teguh Firmansyah{2}, Gunawan Wibisono{2}, Eko Rahardjo{2}, Jun Kondoh{1}
{1}Shizuoka University, Japan; {2}Universitas Indonesia, Indonesia

5:55 AM
4327: Modeling of End Radiation and Leakage in I.H.P. SAW Resonators on Lithium Tantalate with Low Cut Angle
Zhaohui Wu{2}, Keyuan Gong{2}, Yu-Po Wong{1}, Jingfu Bao{2}, Ken-Ya Hashimoto{1}
{1}Chiba University, Japan; {2}University of Electronic Science and Technology of China, China

6:05 AM
4615: High Performance Coupled BAW/SAW Resonator Using ScAlN/AlN Thin Films Hetero Acoustic Layered Structure
Huiling Liu{1}, Qiao Zhen Zhang{1}, Xiang Yong Zhao{1}, Sulei Fu{3}, Wei-Biao Wang{2}
{1}Shanghai Normal University, China; {2}Shoulder Electronics Limited, China; {3}Tsinghua University, China

6:15 AM
5022: 2-8 GHz Range High Harmonic SAW Resonator with Grooved Electrodes in LiNbO3
Michio Kadota, Toshiya Kojima, Shuji Tanaka
Tohoku university, Japan

6:25 AM
5057: Mechanisms of Third-Order Harmonic in TC-SAW Resonators Using a Nonlinear FEM Model
Peng Guan, Ruchuan Shi, Yang Yang, Peng Qin, Tao Han
Shanghai Jiao Tong University, China

6:35 AM
4145: Nonlinear Generation of Subharmonic Signals by Small Particles on RF SAW Resonators
Kazuki Yamamori{1}, Tatsuya Omori{1}, Ken-Ya Hashimoto{2}
{1}Graduate School of Engineering, Chiba University, Japan; {2}School of Electronic Science and Engineering, University of Electronic Science and Technology of Chi, Japan

6:45 AM
4163: Modeling and Suppression Method of the SiO2 Guided Mode on TC-SAW by the Cancelling Circuit
Rei Goto{2}, Gongbin Tang{1}, Tetsuya Tsurunari{2}, Hiroyuki Nakamura{2}
{1}Shandong University, China; {2}Skyworks Solutions, Inc., Japan

6:55 AM
4172: Enhanced Sensitivity of Surface Acoustic Wave (SAW) Current Sensor Based on TbDyFe Thin Film
Yuan Sun{1}, Wen Wang{1}, Lina Cheng{2}, Yana Jia{2}, Yong Liang{2}, Yufeng Zhang{2}
{1}Institute of Acoustics, Chinese Academy of Sciences 2 University of Chinese Academy of Sciences, China; {2}Institute of Acoustics, Chinese Academy of Sciences, Beijing, China, China

7:05 AM
5047: Effects of Silicon Dioxide Cladding Layers on Langasite Based Resonators
Qingchuan Shan{2}, Yang Yang{2}, Qilun Zhang{2}, Wenchang Hao{1}, Wei Luo{1}, Tao Han{2}
{1}Beijing Research Institute of Telemetry, China; {2}Shanghai Jiao Tong University, China

7:15 AM
5079: High Frequency, Low Loss and Low TCF Acoustic Devices on LiTaO3-on-SiC Substrate
Liping Zhang{2}, Shibin Zhang{2}, Hongyan Zhou{2}, Jinbo Wu{2}, Pengcheng Zheng{2}, Hongtao Xu{1}, Zhenghua An{1}, Tiangui You{2}, Xin Ou{2}
{1}Fudan University, China; {2}Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

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Monday, September 13: 8:00 AM - 10:00 AM (Eastern Time)
B2L-01: Brain Special Session
Session Chair(s): Costas Arvanitis (Georgia Institute of Technology)

8:00 AM
5523: MRI-Guided, Acoustic Emissions-Informed, Microbubble-Enhanced Ultrasound for Controlled Blood-Brain Barrier Opening
Pavlos Anastasiadis{2}, Dheeraj Gandhi{2}, Yutong Guo{1}, Abdul-Kareem Ahmed{2}, Soren Bentzen{2}, Costas Arvanitis{1}, Graeme Woodworth{2}
{1}Georgia Institute of Technology, United States; {2}University of Maryland, United States

8:30 AM
4980: Transcranial Histotripsy for Brain Applications
Zhen Xu{1}, Aditya Pandey{2}
{1}Biomedical Engineering, University of Michigan, United States; {2}Department of Neurosurgery, University of Michigan, United States

9:00 AM
4683: Sonobiopsy for Noninvasive and Spatiotemporally Controlled Brain Tumor Liquid Biopsies
Hong Chen
Washington University in St. Louis, United States

9:30 AM
5521: Magnetic Resonance Imaging-Guided Ultrasound Brain Stimulation in Non-Human Primates
Hairong Zheng
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

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Monday, September 13: 8:00 AM - 10:00 AM (Eastern Time)
B2L-02: PPN: Phononics
Session Chair(s): Vincent Laude (Institut FEMTO-ST)

8:00 AM
5519: Controlling Elastic Wave with Solid Pentamode Metamaterials
Gengkai Hu
Beijing institute of Technology, China

8:30 AM
4738: Quasi-Normal Modes of Resonant Phononic Structures
Vincent Laude{1}, Yan-Feng Wang{2}
{1}FEMTO-ST / CNRS / University Burgundy Franche-Comté, France; {2}Tianjin University, China

8:45 AM
4700: Three-Dimensional Phononic Crystal with Ultra-Wide Bandgap at Megahertz Frequencies
Julio Andrés Iglesias Martínez, Johnny Moughames, Gwenn Ulliac, Muamer Kadic, Vincent Laude
FEMTO-ST, France

9:00 AM
5407: Acousto-Optic Modulation in TiO2 Crystal Using GHz Fresnel-Type Focusing Ultrasonic Transducer
Adarsh Ravi, Ved Gund, Amit Lal
Cornell University, United States

9:15 AM
4071: Study on Topological Transport Effect of Two-Dimensional Core-Shell Cylindrical Phononic Crystals
Wei Luo, Wen Can Chen, Ling Lang Yu, Fa Chen, De Gang Zhao, Pan Li
Huazhong University of Science and Technology, China

9:30 AM
4473: Phononic Crystal Induced Torque and Particle Rotation
Laixin Huang, Fei Li, Jingjing Wang, Wei Zhou, Long Meng, Feiyan Cai, Hairong Zheng
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

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Monday, September 13: 8:00 AM - 10:00 AM (Eastern Time)
B2L-03: MCA: Contrast Imaging
Session Chair(s): Paul Dayton (University of North Carolina/NCSU), Mike Averkiou (University of Washington)

8:00 AM
5171: Microbubble-Mediated Drug Delivery Revealed at Microsecond and Micrometer Resolution
Klazina Kooiman
Erasmus MC University Medical Center Rotterdam, Netherlands

8:30 AM
4089: Ultrafast Amplitude Modulation for Molecular and Hemodynamic Ultrasound Imaging
Claire Rabut, Di Wu, Bill Ling, Zhiyang Jin, Dina Malounda, Mikhail Shapiro
California Institute of Technology, United States

8:45 AM
4196: Differentiation of Acute Stroke with Noninvasive Volumetric Ultrasound Localization Microscopy in the Rat Brain
Arthur Chavignon{2}, Vincent Hingot{2}, Cyrille Orset{1}, Denis Vivien{3}, Olivier Couture{2}
{1}Normandie Univ, UNICAEN, INSERM U1237, EFS, PhIND, Cyceron, Institut BB at C, France; {2}Sorbonne Université, CNRS, INSERM, Laboratoire d'Imagerie Biomedicale, France; {3}UNICAEN,INSERM U1237,EFS,PhIND,Cyceron,BB at C,Caen-Normandie University Hospital

9:00 AM
4264: The Use of Lymphosonography for the Identification of Sentinel Lymph Nodes in Breast Cancer Patients
Priscilla Machado, Ji-Bin Liu, Laurence Needleman, Melissa Lazar, Alliric Willis, Adam Berger, Flemming Forsberg
Thomas Jefferson University, United States

9:15 AM
4788: Localization of Nanodroplet Vaporization for Range Verification and Dosimetry in Proton Therapy
Gonzalo Collado-Lara{1}, Sophie Heymans{4}, Marta Rovituso{2}, Yosra Toumia{5}, Hendrik Vos{1}, Jan D'Hooge{4}, Nico de Jong{1}, Koen Van Den Abeele{4}, Verya Daeichin{3}
{1}Erasmus MC, Netherlands; {2}Holland PTC, Netherlands; {3}Kaminari Medical, Netherlands; {4}KU Leuven, Belgium; {5}Tor Vergata University of Rome, Italy

9:30 AM
4284: Online Monitoring of Radiotherapy Using Ultrasound Imaging of Radiation-Induced Nanodroplet Vaporization
Sophie Heymans{3}, Bram Carlier{2}, Sjoerd Nooijens{2}, Gonzalo Collado-Lara{1}, Laurence Delombaerde{2}, Yosra Toumia{4}, Nico de Jong{1}, Jan D'Hooge{2}, Koen Van Den Abeele{3}
{1}Erasmus Medical Center, Netherlands; {2}KU Leuven, Belgium; {3}KU Leuven campus Kulak, Belgium; {4}University of Rome Tor Vergata, Italy

9:45 AM
4981: 3D Dynamic Ultrasound Localization Microscopy In Vivo Validation in Normal and Pathological Animal Models
Chloé Bourquin{3}, Vincent Perrot{3}, Jonathan Porée{3}, Hatim Belgharbi{3}, Nelson Cortés{4}, Géraldine Miquel{2}, Samuel Bélanger{1}, Hugo Ladret{4}, Lamyae Ikan{5}, Christian Casanova{4}, Eric Thorin{2}, Frédéric Lesage{3}, Jean Provost{3}
{1}Labeo Technologies Inc., Canada; {2}Montréal Heart Institute, Canada; {3}Polytechnique Montréal, Canada; {4}School of Optometry, University of Montreal, Canada; {5}University of Montreal, Canada

Monday, September 13: 8:00 AM - 10:00 AM (Eastern Time)
B2L-04: NAF: Acoustic Microfluidics & NFM: Flow Measurement
Session Chair(s): James Friend (UCSD), Matthias Rutsch (Technische Universität Darmstadt)

8:00 AM
4846: High-Throughput and Rapid Cell Lysis Based on Stable Cavitating Bubble Array
Xiufang Liu{3}, Lisheng Xu{1}, Umar Farooq{2}, Ning Rong{2}, Long Meng{2}, Lili Niu{2}, Hairong Zheng{2}
{1}Northeastern University, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China; {3}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences Northeastern University, China

8:15 AM
4795: Investigation of Localized Flexural Lamb Wave for Acoustofluidic Actuation and Particle Control
Philippe Vachon{1}, Srinivas Merugu{1}, Jaibir Sharma{1}, Amit Lal{1}, Eldwin Jiaqiang Ng{2}, Chengkuo Lee{3}
{1}Institute of Microelectronics, Singapore; {2}Institute of Microelectronics, A-STAR (Agency for Science, Technology and Research), Singapore; {3}National University of Singapore, Singapore

8:30 AM
4007: Wirelessly Powered Programmable Swimming Robot Driven by Microscale Lamb Wave Resonators
Yue Feng, Xingchen Li, Ruize Wang, Zhaoxun Wang, Weiwei Cui, Wei Pang
Tianjin University, China

8:45 AM
4827: Ultrasound Tracking of the Acoustically Actuated 3D Swimming Micro Drone
Qiyang Chen, Fang-Wei Liu, Sung Kwon Cho, Kang Kim
University of Pittsburgh, United States

9:00 AM
4737: Ray-Tracing Simulation of Sound Drift Effect for Multi-Path Ultrasonic High-Velocity Gas Flow Metering
Claas Hartmann, Christoph Haugwitz, Gianni Allevato, Matthias Rutsch, Jan Hinrichs, Johannes Brötz, Dieter Bothe, Peter Pelz, Mario Kupnik
Technische Universität Darmstadt, Germany

9:15 AM
4684: The Acoustic Model of Bubble-Liquid Two-Phase Flow and its Application in Flow Measurement
Xiaobo Rui, Bingpu Wang, Yu Zhang, Zhu Feng
Tianjin University, China

9:30 AM
4594: Automatic Beam Alignment in a Clamp-On Ultrasonic Flow Meter Based on Array Transducers
Jack Massaad{1}, Paul van Neer{3}, Douwe van Willigen{1}, Nico de Jong{2}, Michiel A. P. Pertijs{1}, Martin Verweij{1}
{1}Delft University of Technology, Netherlands; {2}Delft University of Technology and Erasmus MC, Netherlands; {3}TNO, Netherlands

9:45 AM
5166: Ultrasound Image Velocimetry with Adaptive Beamforming for Modal Measurements in Liquid Metal Convection
David Weik{2}, Richard Nauber{2}, Lars Büttner{2}, Drik Räbiger{1}, Sanjay Singh{1}, Tobias Vogt{1}, Sven Eckert{1}, Jürgen Czarske{2}
{1}Helmholtz-Zentrum Dresden-Rossendorf, Germany; {2}Technische Universität Dresden, Germany

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Monday, September 13: 8:00 AM - 10:00 AM (Eastern Time)
B2L-05: PAT: Acoustic Tweezers & Particle Manipulation I
Session Chair(s): Teng Ma (Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China)

8:00 AM
5513: Effects of Acoustic Radiation Force on Airborne Particles and Droplets for Portable Applications
Mircea Constantin, Sevan Harput
London South Bank University, United Kingdom

8:15 AM
5155: 3D Particle Assembly Using Multiple Acoustic Holograms
Kai Melde{2}, Heiner Kremer{2}, Christian Degel{1}, Daniel Schmitt{1}, Bernhard Schölkopf{2}, Peer Fischer{2}
{1}Fraunhofer Institute for Biomedical Engineering, Germany; {2}Max Planck Institute for Intelligent Systems, Germany

8:30 AM
4886: 3D Acoustic Manipulation of Living Cells and Organisms Based on 2D Array
Ye Yang, Teng Ma, Qi Zhang, Jiqing Huang, Qi Hu, Yongchuan Li, Congzhi Wang, Hairong Zheng
Shenzhen Institutes of Advanced Technology, China

8:45 AM
4011: Response of Giant Unilamellar Vesicles Under Acoustic Radiation Force
Xuejing Wang{2}, Xiaojun Han{1}, Liangfei Tian{2}
{1}Harbin Institute of Technology, China; {2}Zhejiang University, China

9:00 AM
4154: GHz Bulk Acoustic-Wave Resonator Array Actuated Minimized Collector for High-Efficient E. coli Enrichment
Xingli Xu{1}, Xingchen Li{1}, Weiwei Cui{1}, Shupeng Ning{1}, Mark Reed{2}
{1}Tianjin University, China; {2}Yale University, United States

9:15 AM
5285: Automated Particle and Cell Phenotyping Using Object Recognition and Tracking Based on Machine Learning Algorithms
Gergely B. Hantos{2}, Gergely Simon{1}, Matěj Hejda{3}, Anne L. Bernassau{2}, Marc P. Y. Desmulliez{2}
{1}Edinburgh Instruments, United Kingdom; {2}Heriot-Watt University, United Kingdom; {3}Strathclyde University, United Kingdom

9:30 AM
4894: Noninvasive Acoustic Tweezers for Manipulating and Assembling Human Organoids
Zeping Gao{2}, Teng Ma{2}, Qi Zhang{2}, Qi Hu{2}, Ye Yang{2}, Xiao Zhang{1}, Yufei Sui{1}, Hairong Zheng{2}
{1}Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

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Monday, September 13: 10:30 AM - 12:00 PM (Eastern Time)
B3L-01: MTH: Ultrasound Therapy
Session Chair(s): Zhen Xu (University of Michigan)

10:30 AM
5009: Partial Histotripsy Ablation of Orthotopic Liver Tumor Generates Immune Response and Improves Survival in an In Vivo Metastatic Rodent Tumor Model
Tejaswi Worlikar{1}, Man Zhang{1}, Anutosh Ganguly{1}, Timothy Hall{1}, Lili Zhao{1}, Jiaqi Shi{1}, Fred Lee{2}, Mishal Mendiratta-Lala{1}, Clifford Cho{1}, Zhen Xu{1}
{1}University of Michigan, United States; {2}University of Wisconsin, United States

10:45 AM
4347: Photo-Mediated Ultrasound Therapy for the Treatment of Retinal Neovascularization in Rabbit Eyes
Yu Qin, Yixin Yu, Julia Fu, Yannis Paulus, Xueding Wang, Xinmai Yang
University of Michigan, United States

11:00 AM
4098: 3D High-Resolution and Fast Passive Ultrasound Imaging with Timing Synchronization and Low-Complexity Adaptive Beamforming for Cavitation Detection Under Short HIFU Pulses
Shukuan Lu, Yan Zhao, Lei Zhang, Mingxi Wan
Xi'an Jiaotong University, China

11:15 AM
4314: Preventing Ischemia-Reperfusion Injury via Cell Metabolism Modulation Induced by Ultrasound-Triggered Oxygen-Microbubble Treatment
Yi-Ju Ho, Hui-Ching Hsu, Chih-Kuang Yeh
National Tsing Hua University, Taiwan

11:30 AM
5366: Pressure-Dependent Effect of Droplet Composition on Cavitation-Enhanced Sonothrombolysis in Retracted Clots
Kathlyne Jayne Bautista{3}, Jinwook Kim{3}, Xiaoning Jiang{1}, Zhen Xu{2}, Paul Dayton{3}
{1}North Carolina State University, United States; {2}University of Michigan, Ann Arbor, United States; {3}University of North Carolina at Chapel Hill and North Carolina State University, United States

11:45 AM
4503: Modeling of Intensity-Modulated Focused Ultrasound in Pediatric Brain Tumors Using Acoustic Holograms
Sergio Jiménez-Gambín{6}, Antonios Pouliopoulos{2}, Zachary K. Englander{3}, Noé Jiménez{6}, Francisco Camarena{6}, Elisa Konofagou{1}, Stergios Zacharoulis{4}, Cheng-Chia Wu{5}
{1}Biomedical Engineering and Department of Radiology, Columbia University, United States; {2}Columbia University, United States; {3}Department of Neurological Surgery, Columbia University Irving Medical Center, New York, USA, United States; {4}Department

Monday, September 13: 10:30 AM - 12:00 PM (Eastern Time)
B3L-02: MIS: Image Enhancement
Session Chair(s): Jeremy Dahl (Stanford University), Kai Thomenius (Massachusetts Institute of Technology)

10:30 AM
4703: How Will Echocardiography Benefit from Deep Learning?
Olivier Bernard
CREATIS - University of Lyon, France

11:00 AM
5143: Frequency-Dependent F-Number Maximizes the Contrast and the Spatial Resolution in Fast Pulse-Echo Ultrasound Imaging
Martin Schiffner, Georg Schmitz
Ruhr-Universität Bochum, Germany

11:15 AM
4901: Directional Cross-Correlation for Improved Aberration Phase Estimation in Pulse-Echo Speed-of-Sound Imaging
Samuel Beuret{2}, Baptiste Hériard-Dubreuil{1}, Simon Canales{2}, Jean-Philippe Thiran{2}
{1}E-Scopics, France; {2}École polytechnique fédérale de Lausanne, Switzerland

11:30 AM
5267: Key Considerations for Using the Generalized Contrast-to-Noise Ratio
Dongwoon Hyun{1}, Gene Kim{1}, Nick Bottenus{2}, Jeremy Dahl{1}
{1}Stanford University, United States; {2}University of Colorado Boulder, United States

11:45 AM
5100: Deconstruction and Reconstruction of Image-Degrading Effects in the Human Abdomen: Phase Aberration, Refraction, Multiple Reverberation, and Trailing Reverberation
Danai Eleni Soulioti, Fransisco Santibanez, Gianmarco Pinton
University of North Carolina at Chapel Hill and North Carolina State University, United States

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Monday, September 13: 10:30 AM - 12:00 PM (Eastern Time)
B3L-03: MSD: 3D & Advanced Imaging Systems
Session Chair(s): Piero Tortoli (University of Florence), Steven Freear (University of Leeds)

10:30 AM
4425: Real-Time Ultrasound Open Platform with an Extendable Number of Channels
Daniele Mazierli, Alessandro Ramalli, Enrico Boni, Francesco Guidi, Piero Tortoli
University of Florence, Italy

10:45 AM
4444: A Comparrison of Self-Heat Generation in Capacitive Micromachined Ultrasonic Transducers and Piezoelectric Transducers for Coded Excitation
Borislav Gueorguiev Tomov{1}, Lars Ørsøe{1}, Matthias Bo Stuart{1}, Søren Diederichsen{1}, Erik Vilain Thomsen{2}, Jørgen Arendt Jensen{1}
{1}Technical University of Denmark, Denmark; {2}Technical University of Denmark - Health Technology, Denmark

11:00 AM
4552: The Design and Development of a 2.5 MHz PZT Sparse Array for Cardiac Imaging
Luxi Wei{2}, Enrico Boni{3}, Alessandro Ramalli{3}, Emile Noothout{1}, Antonius van der Steen{2}, Piero Tortoli{3}, Martin Verweij{1}, Nico de Jong{1}, Rik Vos{2}
{1}Delft University of Technology, Netherlands; {2}Erasmus MC University Medical Center, Netherlands; {3}University of Florence, Italy

11:15 AM
5011: A 6144-Element Fully Electronically Steerable MR-Guided Focused Ultrasound Phased Array
Ryan Jones{2}, Yuexi Huang{2}, Benjamin Lucht{1}, Samuel Gunaseelan{2}, Tyler Portelli{1}, Pegah Aslani{2}, Elizabeth David{2}, Kullervo Hynynen{2}
{1}Arrayus Technologies Inc., Canada; {2}Sunnybrook Research Institute, Canada

11:30 AM
5266: Fast Bias-Switching Electronics for Ultrafast Volumetric Imaging with Bias-Encoded Row-Column 2D Arrays
Afshin Kashani Ilkhechi{2}, Mohammad Rahim Sobhani{2}, Chris Ceroici{2}, Katherine Latham{1}, Jeremy Brown{1}, Roger Zemp{2}
{1}Dalhousie University, Canada; {2}University of Alberta, Canada

11:45 AM
5354: Aliasing Resistant Vector Doppler at the Bedside Using GPU Processing and Deep Learning
Hassan Nahas{3}, Billy Yiu{1}, Adrian J. Y. Chee{3}, Takuro Ishii{2}, Alfred.C.H Yu{1}
{1}Schlegel Research Institute for Aging, University of Waterloo, Canada; {2}Tohoku University, Japan; {3}University of Waterloo, Canada

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Monday, September 13: 10:30 AM - 12:00 PM (Eastern Time)
B3L-04: TMI: Polymers & Multomodal Probes
Session Chair(s): Yongrae Roh (Kyungpook National University), Jessica Liu Strohmann (Qualcomm)

10:30 AM
4295: Soft Transducer Materials – Polymer-Based Electrets for Sensors and Actuators
Reimund Gerhard
University of Potsdam, Germany

11:00 AM
4769: Ultrasonic Biometric Authentication System Under Foldable Display
Jessica Liu Strohmann, Yipeng Lu, Hrishikesh Panchawagh, Camilo Perez Saaibi, Ali Lopez, Kostadin Djordjev
Qualcomm, United States

11:15 AM
4576: Analysis of a Dual-Transducer Acoustic Stack Model for Combined Photoacoustic and Ultrasound Intravascular Imaging
Antonio López-Marín{1}, Verya Daeichin{2}, Antonius van der Steen{1}, Gijs van Soest{1}
{1}Erasmus MC, Netherlands; {2}Kaminari Medical B.V., Netherlands

11:30 AM
4906: A Miniature Tri-Modality Endoscopic Probe for Pancreatic Cancer with Optical Coherence Tomography, Ultrasonography and Fluorescence Imaging
Ruiming Kong{2}, Teng Ma{2}, Qi Zhang{2}, Lei Gao{1}, Yutinig Song{2}, Zhuoquan Chen{2}, Hairong Zheng{2}
{1}Shanghai Institute of Technology, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

11:45 AM
4697: A Thin, High Penetration Depth Phased Array Transducer with a Metamaterial Acoustic Backing for Cardiac Imaging with X-Ray Computed Tomography Compatibility
Stephan Strassle Rojas{1}, Srini Tridandapani{2}, Brooks Lindsey{1}
{1}Georgia institute of technology, United States; {2}University of Alabama at Birmingham, United States

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Monday, September 13: 10:30 AM - 12:00 PM (Eastern Time)
B3L-05: APM: Plate Wave & MEMS Resonators I
Session Chair(s): Songbin Gong (University of Illinois at Urbana Champaign), Tuomas Pensala (VTT Technical Research Centre of Finland)

10:30 AM
5003: Heterogeneous Material Integration: From Advanced Substrates to Acoustic Resonators
Ionut Radu
SOITEC, France

11:00 AM
5037: SH1 Mode Plate Wave Resonator on LiTaO3 Thin Plate with Phase Velocity Over 13,000 m/s
Ferriady Setiawan, Michio Kadota, Shuji Tanaka
Tohoku University, Japan; Tohoku University, Indonesia

11:15 AM
4807: An Acoustic Resonator with Electromechanical Coupling of 16% and Low TCF at 5.4 GHz
Ahmed Hassanien, Songbin Gong
University of Illinois at Urbana-Champaign, United States

11:30 AM
5015: XBAR Physics and 5G Filter Design
John Koulakis, Julius Koskela, Wei Yang, Luke Myers, Greg Dyer, Bryant Garcia, Filip Iliev, Ventsislav Yantchev, Sean McHugh, Patrick Turner, Neal Fenzi
Resonant Inc., United States

11:45 AM
5063: An A1 Mode Resonator at 12 GHz Using 160nm Lithium Niobate Suspended Thin Film
Steffen Link{1}, Rouchen Lu{2}, Yansong Yang{1}, Ahmed E. Hassanien{1}, Songbin Gong{1}
{1}University of Illinois at Urbana-Champaign, United States; {2}Univesrity of Texas at Austin, United States

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-06: AFD: Filter Design (PM)
Session Chair(s): Maximilian Pitschi (Qualcomm), Shogo Inoue (Qorvo)

12:15 PM
4376: Breaking the Ladder: Synthesis of Acoustic Wave Ladder Filters with Series Resonators Placing Transmission Zeros Below the Passband
Eloi Guerrero, Jordi Verdú, Pedro de Paco
Universitat Autònoma de Barcelona, Spain

12:25 PM
4381: Considerations for Dual-Band Responses with Parallel-Connected Acoustic Wave Ladder Filters
Eloi Guerrero, Jordi Verdú, Pedro de Paco
Universitat Autònoma de Barcelona, Spain

12:35 PM
4584: Synthesis Methodology of AW Filters for RF Applications Based on Matrix Rotations to Overcome Round-Off Errors
Lluis Acosta, Eloi Guerrero, Patricia Silveira, Jordi Verdú, Pedro de Paco
Universitat Autònoma de Barcelona, Spain

12:45 PM
4957: Synthesis Procedure for Ladder Acoustic Wave Filters Starting in Series Resonator
Rafael Perea-Robles, Jordi Mateu, Carlos Collado
Universitat Politècnica de Catalunya (UPC), Spain

12:55 PM
5115: Dual-Band Dual-Output Codesigned Power Amplifier in Acoustic Wave Technology
Patricia Silveira, Jordi Verdú, Pedro de Paco
Universitat Autònoma de Barcelona, Spain

1:05 PM
5193: Transversal Filter Topology Using a Shunt Arrangement of the Resonators
Jordi Mateu{2}, Rafael Perea-Robles{2}, Carlos Collado{2}, Robert Aigner{1}
{1}Qorvo, United States; {2}UPC, Spain

1:15 PM
5201: Out of Band Improved Performance Into a Measured 5G N77 Band Transversal Filter
Carlos Collado{2}, Jordi Mateu{2}, Rafael Perea-Robles{2}, Yazid Yusud{1}, Alfred Gimenez{1}, Robert Aigner{1}
{1}Qorvo, United States; {2}Universitat Politecnica de Catalunya (UPC), Spain

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-07: MTN: Theranostic Methods (PM)
Session Chair(s): Charles Caskey (Vanderbilt University)

12:15 PM
4904: Automatic Non-Rigid Registration of Preoperative MRI and Intra-Operative US for US-Guided Neurosurgery – A Preliminary Study
Soumya Ghose{2}, Jhimli Mitra{2}, David Mills{2}, Desmond Yeo{2}, Thomas Foo{2}, Alex Golby{1}, Sarah Frisken{1}
{1}Brigham and Women's Hospital, Boston, MA, United States; {2}GE Global Research, Niskayuna, NY, United States

12:25 PM
5286: Tissue Temperature Effects on Cavitation During Focused Ultrasound
Erica McCune, Stephen Lee, Elisa Konofagou
Columbia University, United States

12:35 PM
5302: Control of Radiofrequency Ablation in Ex Vivo Human Liver Tissue Using 3D Echo Decorrelation Imaging Feedback
Elmira Ghahramani Z., Peter Grimm, Bahar Saremi, Jiang Wang, Syed Ahmad, Shimul Shah, Cutler Quillin, Sameer Patel, Marepalli Rao, Douglas Mast
University of Cincinnati, United States

12:45 PM
5422: Hands-Free Ultrasound Lumbar Puncture Guidance Using Redundant Insonification Angles
Keshuai Xu{1}, Baichuan Jiang{1}, Abhay Moghekar{2}, Peter Kazanzides{1}, Emad Boctor{1}
{1}Johns Hopkins University, United States; {2}Johns Hopkins University School of Medicine, United States

12:55 PM
5438: Accuracy of Position and Pose Estimates of Ultrasound Probe Relative to Bony Anatomy
Luke Maclean, Antony J Hodgson
University of British Columbia, Canada

1:05 PM
5233: FUS-net: A U-Net Based Fus Interference RF Filtering Network
Stephen Lee, Elisa Konofagou
Columbia University, United States

1:15 PM
5236: Optically Tracked Steering and Correction of Transcranial Focused Ultrasound
Marshal Phipps{1}, Thomas Manuel{1}, Huiwen Luo{1}, Pai-Feng Yang{2}, Allen Newton{2}, Li Min Chen{2}, William Grissom{1}, Charles Caskey{2}
{1}Vanderbilt University, United States; {2}Vanderbilt University Medical Center, United States

1:25 PM
5451: Machine Learning Assisted Filtering of Harmonic Motion Imaging Guided High Intensity Focused Ultrasound Surgery (HMIgFUS) in an Ex Vivo Human Fibroadenoma Breast Tissue and In Vivo Breast Cancer Mouse
Xiaoyue Li{2}, Stephen Lee{2}, Md Murad Hossain{2}, Niloufar Saharkhiz{2}, Hermes Kamimura{2}, Saurabh Singh{1}, Indranil Basu{1}, Chandan Guha{1}, Elisa Konofagou{2}
{1}Albert Einstein College of Medicine, United States; {2}Columbia University, United States

1:35 PM
4597: Mapping Ultrasound-Triggered Drug Delivery from Perfluorocarbon Nanodroplets in the Brain
Harriet Lea-Banks, Kullervo Hynynen
Sunnybrook Research Institute, Canada

1:45 PM
4920: Acoustic Signature: A Therapeutic Ultrasound Guidance Technique with Sub-Millimeter Accuracy
Thomas Manuel{1}, Aparna Singh{1}, Jiro Kusunose{2}, Charles Caskey{1}
{1}Vanderbilt University, United States; {2}Vanderbilt University Medical Center, United States

1:55 PM
5400: Coherence-Factor-Based Passive Acoustic Mapping for Real-Time Transcranial Cavitation Monitoring with Improved Axial Resolution
Sua Bae, Keyu Liu, Antonios Pouliopoulos, Elisa Konofagou
Columbia University, United States

2:05 PM
5425: Passive Acoustic Mapping Bandwidth Reduction Using a Hardware Wavelet-Compressor
Chris Adams, Ryan Jones, Yi-Shiuan Chen, Woey Li, Kullervo Hynynen
Sunnybrook Research Institute, Canada

Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-08: MBB: Adaptive Imaging Methods (PM)
Session Chair(s): Hanna Bendjador (Stanford University)

12:15 PM
4230: A Translatable Approach to Spatial Coherence Imaging Using Acoustic Reciprocity
Jasmine Shu, Dongwoon Hyun, You Li, Jeremy Dahl
Stanford University, United States

12:25 PM
4527: Improving Signal-to-Noise Ratio Through Generalized Multi-Pulse Transmit Encoding
Nick Bottenus
University of Colorado Boulder, United States

12:35 PM
4656: Frequency Domain Beamforming of Ultrasound Signals from Multistatic Acquisitions with Range-Doppler Algorithm
Marko Jakovljevic{3}, Roger Michaelides{2}, Ettore Biondi{1}, Dongwoon Hyun{3}, Howard Zebker{3}, Jeremy Dahl{3}
{1}California Institute of Technology, United States; {2}Colorado School of Mines, United States; {3}Stanford University, United States

12:45 PM
5020: Boundary Array Transducer Combined with Coherence Estimation of Channel Data
Jesse Yen{2}, Yang Lou{1}
{1}Seno Medical, United States; {2}University of Southern California, United States

12:55 PM
5222: Detection and Suppression of Partially Correlated Reverberation Clutter Using Matrix Arrays
Rifat Ahmed{1}, Nick Bottenus{2}, James Long{1}, Gregg Trahey{1}
{1}Duke University, United States; {2}University of Colorado Boulder, United States

1:05 PM
5330: Plane Wave Beamforming Approaches with Dual-Frequency Arrays for High Frame Rate Micro-Ultrasound Imaging
Jing Yang{4}, Emmanuel Chérin{2}, Jianhua Yin{2}, Lauren Wirtzfeld{1}, Paul Dayton{3}, Stuart Foster{4}, Christine Démoré{4}
{1}Fujifilm VisualSonics, Canada; {2}Sunnybrook Research Institute, Canada; {3}University of North Carolina at Chapel Hill and North Carolina State University, United States; {4}University of Toronto, Canada

1:15 PM
5360: Real-Time Reverberation Reduction of Ultrasound Channel Data Using a 3D Convolutional Neural Network
Leandra Brickson, Dongwoon Hyun, Jeremy Dahl
Stanford University, United States

1:25 PM
5363: Performing Aperture Domain Model Image REconstruction (ADMIRE) Using a Deep Neural Network Sparse Encoder
Christopher Khan{2}, Ruud van Sloun{1}, Brett Byram{2}
{1}Eindhoven University of Technology, Netherlands; {2}Vanderbilt University, United States

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-09: MIS: Imaging & Image Enhancement & Decluttering II (PM)
Session Chair(s): Dainel Rohrbach (Verasonics)

12:15 PM
4019: Improving Contrast of Fundamental Ultrasound Imaging Using a Deep Neural Network
Ali Sadeghi, Iason Zacharias Apostolakis, Can Meral, Francois Vignon, Jun Seob Shin, Jean-Luc Robert
Philips Research North America, United States

12:25 PM
4135: An Information-Theoretic Spatial Resolution Metric for Qualitative Images
Dongwoon Hyun
Stanford University, United States

12:35 PM
4974: On Model Space Sampling for Admire for Image Quality and Computational Efficiency
Siegfried Schlunk, Brett Byram
Vanderbilt University, United States

12:45 PM
5040: Plane-Wave Fourier-Domain Beamforming with CNN-Assisted Resolution Enhancement
Shravanthi Musti, Daler Rakhmatov
University of Victoria, Canada

12:55 PM
5404: Improving Tumor Detection in Acoustic Angiography Images with Deep Convolutional Neural Networks and Class Activation Mapping
Thomas Kierski{1}, Isabel Newsome{1}, Paul Dayton{2}
{1}University of North Carolina - Chapel Hill, United States; {2}University of North Carolina at Chapel Hill and North Carolina State University, United States

1:05 PM
4111: Despeckling Ultrasound Images Using Quantum Many-Body Physics
Sayantan Dutta{1}, Adrian Basarab{1}, Bertrand Georgeot{2}, Denis Kouamé{1}
{1}Institut de Recherche en Informatique de Toulouse, UMR CNRS 5505, Université de Toulouse, France; {2}Laboratoire de Physique Théorique, Université de Toulouse, CNRS, UPS, France

1:15 PM
4972: Data-Driven Quadratic Kernel Synthesis for Nonlinear Ultrasound Imaging
Abhishek Sahoo{2}, Emad Ebbini{1}
{1}University of Minnesota, United States; {2}University of Minnesota Twin Cities, United States

1:25 PM
5027: Ultrasound Domain Adaptation Using Frequency Domain Analysis
Mostafa Sharifzadeh, Ali K.Z. Tehrani, Habib Benali, Hassan Rivaz
Concordia University, Canada

1:35 PM
5308: Advanced Deep Learning Network with Harris Corner Based Background Motion Modeling for Motion Tracking of Targets in Ultrasound Images
Mohammad Wasih{2}, Mohamed Almekkawy{1}
{1}Pennsylvania State University, United States; {2}Pennsylvania State University, University Park, Pennsylvania, USA, United States

1:45 PM
5326: Enhanced 4D Spatio-Temporal Resolution Using Multi-Perspective Ultrasound Demonstrated in Abdominal Aortic Aneurysms
Marloes Sjoerdsma{2}, Sabine Verstraeten{2}, Esther Maas{1}, Marc van Sambeek{1}, Frans van de Vosse{2}, Richard Lopata{2}
{1}Catharina Hospital Eindhoven, Netherlands; {2}Eindhoven University of Technology, Netherlands

1:55 PM
5413: A Substitution of Convolutional Layers by FFT Layers – A Low Computational Cost Version
Umar Farooq Mohammad, Mohamed Almekkawy
Pennsylvania State University, United States

2:05 PM
5509: A Beamformer-Independent Method to Predict Photoacoustic Visual Servoing System Failure from a Single Image Frame
Eduardo Gonzalez, Muyinatu Bell
Johns Hopkins University, United States

Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-10: MIM: Super-Resolution Imaging IV (PM)
Session Chair(s): Jean Provost (Polytechnique Montreal)

12:15 PM
4303: Functional Ultrasound Imaging of the Brain Using Deep Learning and Sparse Data
Tommaso Di Ianni, Raag Airan
Stanford University, United States

12:25 PM
4763: Deep Learning-Based Segmentation for Ultrasound Liver Tumors
Qinhan Gao{2}, Mohamed Almekkawy{1}
{1}Pennsylvania State University, United States; {2}PSU, United States

12:35 PM
5010: Explainable AI and Susceptibility to Adversarial Attacks: A Case Study in the Classification of Breast Ultrasound Images
Hamza Rasaee, Hassan Rivaz
Concordia University, Canada

12:45 PM
5316: Motion Tracking of Carotid Artery in Ultrasound Images Using Lucas Kanade Method with Advanced Siamese Neural Networks
Mohammad Wasih{2}, Mohamed Almekkawy{1}
{1}Pennsylvania State University, United States; {2}Pennsylvania State University, University Park, Pennsylvania, USA, United States

12:55 PM
5393: Anatomical Feature-Based Lung Ultrasound Image Assessment Using Deep Convolutional Neural Network
Surya Murugavel Ravishankar{2}, Ryosuke Tsumura{2}, John Hardin{1}, Beatrice Hoffmann{1}, Ziming Zhang{2}, Haichong Zhang{2}
{1}Beth Israel Deaconess Medical Center, United States; {2}Worcester Polytechnic Institute, United States

1:05 PM
5440: Assessment of Interoberserver Reliability of Deep Learning Models in Ultrasound Breast Ultrasound Segmentation
Jeremy Webb, Shaheeda Adusei, Duane Meixner, Yinong Wang, Robert Fazzio, Mostafa Fatemi, Azra Alizad
Mayo Clinic College of Medicine and Science, United States

1:15 PM
5447: Automatic Deep Learning Semantic Segmentation of Ultrasound Thyroid Cineclips Using Recurrent Fully Convolutional Networks
Jeremy Webb{1}, Duane Meixner{1}, Shaheeda Adusei{1}, Eric Polley{2}, Mostafa Fatemi{1}, Azra Alizad{1}
{1}Mayo Clinic College of Medicine and Science, United States; {2}University of Chicago, United States

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-11: MBF: Blood Flow Imaging II (PM)
Session Chair(s): Jérôme Baranger (SickKids Hospital)

12:15 PM
4699: Blood Flow Recovery from Subsampled Data in Photoacoustic Microscopy
Sushanth Sathyanarayana{2}, Zhuoying Wang{3}, Bo Ning{1}, Naidi Sun{3}, Song Hu{3}, John Hossack{2}
{1}Children's National Hospital, Washington D.C, United States; {2}University of Virginia, United States; {3}Washington University in St. Louis, United States

12:25 PM
5154: Rank-Assisted Deep Residual Reconstruction Network for Non-Contrast Ultrasound Imaging of Blood Microvessels
Sam Ehrenstein, Eric Abenojar, Reshani Perera, Agata Exner, Mahdi Bayat
CWRU, United States

12:35 PM
5383: Development of a Contrast-Enhanced Ultrasound Biomarker for Spinal Cord Injury Severity
Jonah Harmon, Zin Khaing, Lindsay Cates, Jeffrey Hyde, Christoph Hofstetter, Matthew Bruce
University of Washington, United States

12:45 PM
5056: Super-Resolution Imaging of Renal Microvascular in Chronic Kidney Disease by Ultrasound Localization Microscopy
Chengwu Huang{1}, Xiaodan Zhang{3}, Wei Zhang{3}, Ping Gong{1}, U Wai Lok{1}, Shanshan Tang{1}, Xuqi He{3}, Xirui Zhang{2}, Lei Zhu{2}, Maodong Sang{2}, Rongqin Zheng{3}, Shigao Chen{1}
{1}Mayo Clinic, United States; {2}Shenzhen Mindray Bio-Medical Electronics Co. Ltd., China; {3}Third Affiliated Hospital of Sun Yat-Sen University, China

12:55 PM
4819: In Vivo Ultrasound Localization Microscopy of Orthotopic Mouse Tumors Using Phase-Changing Nanodrops
Matthew Lowerison{2}, Awaneesh Upadhyay{1}, Timothy Fan{2}, Mark Borden{1}, Pengfei Song{2}
{1}University of Colorado at Boulder, United States; {2}University of Illinois at Urbana-Champaign, United States

1:05 PM
4512: Blood Flow Velocity and Wall Shear Stress Estimation in Forward-Viewing Intravascular Ultrasound Imaging: Comparison of Doppler and Particle Image Velocimetry (PIV) Approaches
Saeyoung Kim{2}, Bowen Jing{1}, Brooks Lindsey{1}
{1}Biomedical Engineering, Georgia Institute of Technology and Emory University, United States; {2}Mechanical Engineering, BioEngineering Graduate Program, Georgia Institute of Technology, United States

1:15 PM
5318: In Vitro and Clinical Demonstration of Relative Velocity Measurements with the Flopatch™: A Wearable Doppler Ultrasound Patch
Chelsea Munding{1}, Christopher Acconcia{1}, Mai Elfarnawany{1}, Joseph Eibl{1}, Pietro Verrecchia{1}, Patrick Leonard{1}, Aaron Boyes{3}, Zhen Yang{1}, Rony Atoui{2}, Christine Démoré{4}
{1}Flosonics Medical, Canada; {2}Health Sciences North, Canada; {3}Sunnybrook Research Institute, Canada; {4}University of Toronto, Canada

1:25 PM
5350: Ai-Based High-Quality Color Doppler: Application to Phantom and In Vivo Datasets
Iason Zacharias Apostolakis{2}, Zahid Hasan{2}, Francois Vignon{2}, Faik Can Meral{2}, Junseob Shin{2}, Jean-Luc Robert{2}, Thanasis Loupas{1}
{1}Philips, United States; {2}Philips Research North America, United States

1:35 PM
5379: Tomographic Doppler Ultrasound: Multi-Aperture Functional Imaging in an Octagonal Geometry
Anthony S. Podkowa, Josquin Foiret, Katherine Ferrara
Stanford University, United States

Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-12: MPA: Photoacoustic Imaging III (PM)
Session Chair(s): Kelsey Kubelick (Georgia Tech and Emory University)

12:15 PM
4546: Photoacoustic Imaging of Squirrel Monkey Cortical and Subcortical Brain Regions During Peripheral Electrical Stimulation
Kai-Wei Chang{4}, Yunhao Zhu{1}, Heather Hudson{3}, Scott Barbay{3}, David Guggenmos{3}, Randolph Nudo{3}, Xinmai Yang{2}, Xueding Wang{4}
{1}Nanjing University, China; {2}University of Kansas, United States; {3}University of Kansas Medical Center, United States; {4}University of Michigan, United States

12:25 PM
4838: Comparative Evaluation of Blood Brain Barrier Disruption (BBBD) Techniques Using Transcranial Photoacoustic Imaging In Vivo
Jeeun Kang, Ernest Graham, Raymond Koehler, Emad Boctor
Johns Hopkins University, United States

12:35 PM
5292: Photoacoustic Imaging Simulations of Kidney Fibrosis
Taehoon Bok{1}, Eno Hysi{2}, Darren Yuen{2}, Michael Kolios{1}
{1}Ryerson University, Canada; {2}St. Michael's Hospital, Canada

12:45 PM
5312: Photoacoustic Necrotic Region Mapping for RF Ablation Guidance
Shang Gao{3}, Hiroshi Ashikaga{1}, Tommaso Mansi{2}, Henry Halperin{1}, Haichong Zhang{3}
{1}Johns Hopkins University, United States; {2}Siemens Healthineers, United States; {3}Worcester Polytechnic Institute, United States

12:55 PM
5419: Comparison of Compressional and Elastic Photoacoustic Simulations for Planning, Imaging, and Guidance of Neurosurgeries
Michelle Graham{1}, Reese Dunne{2}, Muyinatu Bell{1}
{1}Johns Hopkins University, United States; {2}Mississippi State University, United States

1:05 PM
5469: Real-Time Trimodal Ultrasound, Photoacoustic, and Thermoacoustic Imaging for Biomedical Applications
Eric Reichel, Ehab Tamimi, Russell Witte
University of Arizona, United States

1:15 PM
5470: Transcranial Multiparametric Photoacoustic Imaging of Tactile Stimulation in Swine Brain In Vivo
Jeeun Kang, Xiuyun Liu, Ernest Graham, Raymond Koehler, Emad Boctor
Johns Hopkins University, United States

1:25 PM
4045: Photoacoustic Imaging the Relative Size of Optical Absorbing Aggregates
Lokesh Basavarajappa{1}, Kenneth Hoyt{2}
{1}University of Texas at Da, United States; {2}University of Texas at Dallas, United States

1:35 PM
4764: Comparative Evaluation of CNN-Based Workflows for Automated Photoacoustic Detection of Hypoxic-Ischemic Encephalopathy
Baichuan Jiang{2}, Jeeun Kang{1}, Ernest Graham{1}, Emad Boctor{2}
{1}Johns Hopkins Medical Institute, United States; {2}Johns Hopkins University, United States

1:45 PM
4766: Automated Photoacoustic Monitoring of Superior Sagittal Sinus with Landmark Detection
Baichuan Jiang{2}, Jeeun Kang{1}, Ernest Graham{1}, Emad Boctor{1}
{1}Johns Hopkins Medical Institute, United States; {2}Johns Hopkins University, United States

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-13: MTH: Hyperthermia, Histotripsy & Immunomodulation II (PM)
Session Chair(s): William Apoutou NDjin (INSERM)

12:15 PM
4083: Acoustic Holograms to Enhance Hyperthermia Treatment Volumes
Diana Andrés{1}, Jonathan Vappou{2}, Noé Jiménez{1}, Francisco Camarena{1}
{1}Universitat Politècnica de València, Spain; {2}Université de Strasbourg, France

12:25 PM
4513: Real-Time Non-Invasive Control of Tissue Temperature Using High-Frequency Ultrasonic Backscattered Energy
Elyas Shaswary{1}, Hisham Assi{1}, Celina Yang{1}, Carl Kumaradas{1}, Michael Kolios{2}, Gholam Peyman{3}, Jahan Tavakkoli{2}
{1}Ryerson University, Canada; {2}Ryerson University and St. Michael's Hospital, Canada; {3}University of Arizona and Cancer Rx Inc., United States

12:35 PM
5249: Immune Modulation of Thermal and Mechanical HIFU in a Murine Model of Breast Cancer
Brett Fite{1}, James Wang{1}, Aris Kare{1}, Michael Chavez{1}, Nisi Zhang{1}, Elise Robinson{1}, Azadeh Kheirolomoom{1}, Matthew Silvestrini{2}, Ryan Davis{2}, Clifford Tepper{2}, Alexander Borowsky{2}, Katherine Ferrara{1}
{1}Stanford University, United States; {2}University of California Davis, United States

12:45 PM
5324: Hyperthermia Generation and Control with a Ring-Based Ultrasound Tomography System
Alexander Pattyn{2}, Karl Kratkiewicz{2}, Naser Alijabbari{2}, Neb Duric{2}, Paul Carson{1}, Mohammad Mehrmohammadi{2}
{1}University of Michigan, United States; {2}Wayne State University, United States

12:55 PM
5358: Closed-Loop Trans-Skull Ultrasound Hyperthermia with Thermosensitive Drugs Leads to Improved Survival in Gliomas
Chulyong Kim{2}, Yutong Guo{1}, Krishna Ramajayam{3}, Dieter Haemmerich{3}, Costas Arvanitis{1}
{1}Georgia Institute of Technology, United States; {2}Goergia Institute of Technology, United States; {3}Medical University of South Carolina, United States

1:05 PM
5456: HIFU and Agonist CD40 Enhance Immune Response in Breast and Pancreatic Cancer Models
James Wang, Brett Fite, Aris Kare, Bo Wu, Marina Rae, Spencer Tumbale, Katherine Ferrara
Stanford University, United States

1:15 PM
4968: Histotripsy Parameter Study on Murine Brain
Sang Won Choi, Sarah Duclos, Sandra Camelo-Piragua, Timothy Hall, Jonathan Sukovich, Aditya Pandey, Zhen Xu
University of Michigan, United States

1:25 PM
4978: Aberration Correction for Transcranial Histotripsy
Ning Lu, Timothy Hall, Jonathan Sukovich, Zhen Xu
University of Michigan, United States

1:35 PM
5507: In-Vivo High-Resolution Imaging + Histotripsy in Rat Brains Using a Combined Endoscopic Device
Thomas Landry{1}, Matthew Mallay{1}, Nicholas Campbell{1}, Eli Vlaisavljevich{2}, Jeremy Brown{1}
{1}Dalhousie University, Canada; {2}Virginia Polytechnic Institute and State University, United States

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-14: MTH: Brain & Neuromodulation II (PM)
Session Chair(s): Qifa Zhou (University of Southern California)

12:15 PM
4352: Transcranial Ultrasound Stimulation Improves Cognitive Functions in Alzheimer's Disease Mice
Na Pang{1}, Lili Niu{2}, Lisheng Xu{1}, Long Meng{2}, Hairong Zheng{2}
{1}College of Medicine and Biological Information Engineering, Northeastern University, China; {2}Paul C. Lauterbur Research Center for Biomedical Imaging, Shenzhen Institutes of Advanced Technology, China

12:25 PM
5034: Transcranial Focused Ultrasound Neuromodulation on Visual Cortex with Optic Nerve Damage
Gengxi Lu, Xuejun Qian, Runze Li, Biju Thomas, Mark Humayun, Qifa Zhou
University of Southern California, United States

12:35 PM
5204: Optical Tracking Informed Acoustic Simulations for Transcranial Applications
Michelle Sigona{1}, Thomas Manuel{1}, Marshal Phipps{1}, Huiwen Luo{1}, Jiro Kusunose{2}, Pai-Feng Yang{2}, Li Men Chen{2}, William Grissom{1}, Charles Caskey{1}
{1}Vanderbilt University, United States; {2}Vanderbilt University Medical Center, United States

12:45 PM
5256: Ultrasound Neurostimulation in Ex Vivo Sea Slug Brains
Tomas Jordan{1}, James Newcomb{2}, Michael Hoppa{1}, Geoffrey Luke{1}
{1}Dartmouth College, United States; {2}New England College, United States

12:55 PM
5392: Estimation of Human Skull Attenuation in Ultrasound-Mediated Blood-Brain Barrier Opening Performed at 0.25 MHz Using Numerical Simulations
Omid Yousefian, Antonios Pouliopoulos, Hermes Kamimura, Elisa Konofagou
Columbia University, United States

1:05 PM
5508: Influence of Acoustic Parameters on Motor Response After Ultrasound Neurostimulation: An EMG Investigation
Tarik Iazourene{2}, Hanaa Malloul{2}, Rasha Noureddine{1}, Edward Oujagir{2}, Jean-Michel Escoffre{2}, Ayache Bouakaz{2}
{1}Lebanese University, Hadath, Lebanon; {2}UMR 1253, iBrain, Université de Tours, Inserm, France

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Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-15: MEL: Cardiovascular Elastography II (PM)
Session Chair(s): Murad Hossain (Columbia University)

12:15 PM
4493: Viscoelasticity Inversion for Arterial Shear Wave Elastography
Tuhin Roy{2}, Matthew W. Urban{1}, James F. Greenleaf{1}, Murthy N. Guddati{2}
{1}Mayo Clinic, United States; {2}North Carolina State University, United States

12:25 PM
4611: 3D Measurements of Shear Wave Propagation Through a Tube for Shear Wave Elastography in Arteries
Hyungkyi Lee{2}, Hsiao-Chuan Liu{2}, Nicholas R. Hugenberg{1}, Hadiya Harrigan{1}, Wilkins Aquino{1}, James F. Greenleaf{2}, Matthew W. Urban{2}
{1}Duke University, United States; {2}Mayo clinic, United States

12:35 PM
4971: In Vivo Apical Infarct Localization Using Adaptive Bayesian Cardiac Strain Imaging
Rashid Al Mukaddim, Ashley Weichmann, Rachel Taylor, Timothy Hacker, Thomas Pier, Melissa Graham, Carol Mitchell, Tomy Varghese
University of Wisconsin-Madison, United States

12:45 PM
5251: Myocardium Stiffness Assessment Using Catheter-Based Transient Elastography
Samuel Morais{1}, Andrei Karpiouk{1}, Jingfei Liu{1}, Stanislav Emelianov{2}
{1}Georgia Institute of Technology, United States; {2}Georgia Institute of Technology and Emory University School of Medicine, United States

12:55 PM
5284: Myocardial Elastography with ECG-Gating and Coherent Compounding for Early Diagnosis of Coronary Artery Disease
Julien Grondin, Vincent Sayseng, Changhee Lee, Rachel Weber, Sabahat Bokhari, Andrew Einstein, Elisa Konofagou
Columbia University, United States

1:05 PM
5346: Atherosclerotic Plaque Characterization in Humans with ARFI Variance of Acceleration: Blinded Reader Study
Gabriela Torres, Melissa Caughey, Keerthi Anand, Benjamin Huang, Ellie Lee, Carlos Zamora, Sheng-Che Huang, Elizabeth Merricks, Jonathon Homeister, Mark Farber, Caterina Gallippi
University of North Carolina at Chapel Hill, United States

Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-16: MSD: Medical Device (PM)
Session Chair(s): Sevan Harput (London), Enrico Boni (University of Florence)

12:15 PM
5416: Real-Time Dual-Mode Ultra-Fast High-Frequency Beamformer
Nicholas Campbell, Chris Samson, Jeremy Brown
Dalhousie, Canada

12:25 PM
4032: 3-D Voxel-Level Tissue Classification of Ultrasound Scattering Using a Sparse Matrix Array Transducer
Haowei Tai, Lokesh Basavarajappa, Mawia Khairalseed, Kenneth Hoyt
University of Texas at Dallas, United States

12:35 PM
5306: Patient-Specific Stereotactic Frame for Repeated Transcranial Ultrasound Therapy
Jiro Kusunose{2}, William Rodriguez{1}, Huiwen Luo{1}, William Grissom{1}, Benoit Dawant{1}, Charles Caskey{2}
{1}Vanderbilt University, United States; {2}Vanderbilt University Medical Center, United States

12:45 PM
5368: Compact Sonoporation Device to Perform Sonoporation Experiments on Adherent Cells
Mohammad Jahromi{1}, Ganga Poudel{1}, Steven Jones{2}, Laura Curiel{2}
{1}Universith of Calgary, Canada; {2}University of Calgary, Canada

12:55 PM
5386: Design and Evaluation of a Pre-Clinical Sparse Hemispherical Array for Acoustic Monitoring and Control of Microbubble-Mediated Ultrasound Brain Therapy
Yi Lin{2}, Ryan Jones{1}, Kullervo Hynynen{2}
{1}Sunnybrook Research Institute, Canada; {2}University of Toronto, Canada

1:05 PM
5435: Lamb Wave-Based Ultrasound Neuro-Stimulation Devices
Jeong Nyeon Kim, Martin Prieto, Kamyar Firouzi, Merritt Maduke, Butrus Thomas Khuri-Yakub
Stanford University, United States

Monday, September 13: 12:15 PM - 2:15 PM (Eastern Time)
B4P-17: NSP: Signal Processing Deep Learning (PM)
Session Chair(s): Erdal Oruklu (Illinois Institute of Technology)

12:15 PM
5125: Tumor Photoacoustic Image Reconstruction Method Based on Deep Learning
Ming-Jian Sun{1}, Wei-Xiang Li{1}, Zi-Chao Liu{1}, Guang-Xing Liu{2}
{1}Harbin Institute of Technology, Weihai, China; {2}Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China

12:25 PM
4370: Reinforcement Learning and Hardware in the Loop for Localized Vibrotactile Feedback in Haptic Surfaces
Camilo Hernandez-Mejia{1}, Marc Favier{2}, Xiaotao Ren{1}, Paolo Germano{1}, Yves Perriard{1}
{1}LAI - EPFL, Switzerland; {2}Sorbonne Université Paris, France

12:35 PM
4913: A Real-Time Machine Learning Approach to Grain Orientation Mapping of Anisotropic Media for Improved Ultrasonic Non-Destructive Evaluation
Jonathan Singh{3}, Katherine Tant{3}, Anthony Mulholland{1}, Andrew Curtis{2}
{1}University of Bristol, United Kingdom; {2}University of Edinburgh, United Kingdom; {3}University of Strathclyde, United Kingdom

12:45 PM
5220: Deep Learning for Multi-View Ultrasound Image Fusion
Georgios Pilikos{2}, Lars Horchens{1}, Tristan van Leeuwen{2}, Felix Lucka{2}
{1}Applus E&I Technology Centre, Netherlands; {2}Centrum Wiskunde & Informatica, Netherlands

12:55 PM
4833: Localization of Ultrasonic Flaws Using Grid Based Deep Learning
Kushal Virupakshappa, Erdal Oruklu
Illinois Institute of Technology, United States

1:05 PM
4835: Aggregation of Neural Networks for Ultrasonic Flaw Classification
Michael Marino, Kushal Virupakshappa, Erdal Oruklu
Illinois Institute of Technology, United States

1:15 PM
5216: Intelligent Ultrasonic NDE System for Material Texture Recognition Using Data-Efficient Neural Networks
Xin Zhang, Xinrui Yu, Jafar Saniie
Illinois Institute of Technology, United States

1:25 PM
5341: Modeling of the Forward Wave Propagation Using Physics-Informed Neural Networks
Shaikhah Alkhadhr, Xilun Liu, Mohamed Almekkawy
Pennsylvania State University, United States

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-06: MTC: Tissue Characterization I (AM)
Session Chair(s): Mathieu Pernot (ESPCI Paris)

5:45 AM
4118: 40 MHz High Spatiotemporal Resolution Cardiac Strain Imaging for Mice via Vector Doppler Estimation
Hsin Huang, Chih-Chung Huang
National Cheng Kung University, Taiwan

5:55 AM
4775: Local Measurement of Myocardial Strain Rate Distribution Using Multifrequency Phased Tracking Velocity Estimator
Yu Obara, Shohei Mori, Mototaka Arakawa, Hiroshi Kanai
Tohoku University, Japan

6:05 AM
5090: Evaluation of Cerebral Artery Occlusion by Pulse Waveforms Measured at Carotid Artery
Takuma Shimada{1}, Mami Matsukawa{1}, Miho Ohsaki{1}, Yasuyo Kobayashi{2}, Kozue Saito{2}, Hiroshi Yamagami{3}
{1}Doshisha University, Japan; {2}Nara Medical University, Japan; {3}National Hospital Organization Osaka National Hospital, Japan

6:15 AM
5096: Effect of Displacement of Carotid Artery Perpendicular to Ultrasound Beam Direction Caused by Pulsation on Ultrasound Measurement of Local Elasticity in Plaque
Yuta Haji{2}, Shohei Mori{2}, Mototaka Arakawa{2}, Toshio Yamagishi{1}, Hiroshi Kanai{2}
{1}Tohoku Kosai Hospital, Japan; {2}Tohoku University, Japan

6:25 AM
5097: A Workflow for 3D(+t) US-Based Mechanical Analysis of Abdominal Aortic Aneurysms Including the Intraluminal Thrombus
Arjet Nievergeld{2}, Esther Maas{2}, Judith Fonken{2}, Frans van de Vosse{2}, Marc van Sambeek{1}, Richard Lopata{2}
{1}Catharina hospital Eindhoven, Netherlands; {2}Eindhoven University of Technology, Netherlands

6:35 AM
5234: Electromechanical Wave Imaging and Passive Elastrography for Cardiac Activity Charaterization and Thermal Lesion Formation Monitoring In-Vivo
Jade Robert{2}, Francis Bessière{2}, Geoffroy Ditac{2}, Lionel Auguel{1}, Elodie Cao{2}, Jean-Baptiste Nayrand{2}, Stefan Catheline{2}, Cyril Lafon{2}
{1}CarMeN Laboratory, Université Lyon, INSERM, INRA, INSA Lyon, Université Claude Bernard Lyon 1, Ville, France; {2}LabTAU, INSERM, Centre Léon Bérard, Université Lyon 1, Univ Lyon, F-69003, LYON, France

6:45 AM
4777: Ex-Vivo Ultrasonic Tomography Imaging of Cortical Bone Based on Velocity Model Prediction
Yifang Li{2}, Qinzhen Shi{2}, Yuan Liu{3}, Lingwei Shi{2}, Meilin Gu{2}, Xiaojun Song{2}, Chengcheng Liu{1}, Dean Ta{2}
{1}Academy for Engineering and Technology, Fudan University, China; {2}Center for Biomedical Engineering, School of Information Science and Technology, Fudan University, China; {3}First People's Hospital of Chenzhou, China

6:55 AM
4780: Wavenumber-Domain Ultrasonic Imaging of the Bone Cortex Based on Velocity Distribution Estimation
Yifang Li{2}, Qinzhen Shi{2}, Yuan Liu{3}, Lingwei Shi{2}, Meilin Gu{2}, Xiaojun Song{2}, Chengcheng Liu{1}, Dean Ta{2}
{1}Academy for Engineering and Technology, Fudan University, China; {2}Center for Biomedical Engineering, School of Information Science and Technology, Fudan University, China; {3}First People's Hospital of Chenzhou, China

7:05 AM
5076: An Ultrasonic Screening Technique of Equine Metacarpal Bone with Periostitis
Kazuki Miyashita{1}, Hidetoshi Suzuyama{1}, Ko Chiba{3}, Hiroshi Mita{2}, Norihisa Tamura{2}, Mami Matsukawa{1}
{1}Doshisha University, Japan; {2}JRA Equine Research Institute, Japan; {3}Nagasaki University, Japan

7:15 AM
5091: Wave Velocity Decrease in Bones of Streptozotocin Induced Diabetic Rat
Keita Yano, Yoshihiko Maekawa, Koki Shirai, Masaya Ikegawa, Mami Matsukawa
Doshisha University, Japan

7:25 AM
5107: Ultrasonic Monitoring of the Dentin Demineralization Dynamics
Josep Rodríguez-Sendra{2}, Alicia Carrión{2}, Inés Torres{1}, Noé Jiménez{2}, Salvatore Sauro{1}, Francisco Camarena{2}
{1}Universidad CEU-Cardenal Herrera, Spain; {2}Universitat Politècnica de València-CSIC, Spain

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-07: MCA: High Resolution Contrast Imaging (AM)
Session Chair(s): Olivier Couture (CNRS at Sorbonne University)

5:45 AM
4342: LSUSHI: Learned Sparsity Based Ultrasound Super Resolution Hemodynamic Imaging
Or Bar-Shira{2}, Ruud van Sloun{1}, Yonina C. Eldar{2}
{1}Eindhoven University of Technology, Netherlands; {2}Weizmann Institute of Science, Israel

5:55 AM
4719: Volumetric Ultrasound Localization Microscopy Behind a Human Skull Phantom
Antoine Coudert, Arthur Chavignon, Vincent Hingot, Louise Denis, Olivier Couture
Sorbonne Universite CNRS INSERM, France

6:05 AM
4720: 3D-Printed High-Resolution Microchannels for Contrast Enhanced Ultrasound Research
Roger Domingo-Roca{2}, Lauren Gilmour{2}, Lisa Asciak{2}, Stylianos Sarrigiannidis{1}, Oana Dobre{1}, Mairi. E Sandison{2}, Richard O'Leary{2}, Joseph Jackson{2}, Helen Mulvana{2}
{1}University of Glasgow, United Kingdom; {2}University of Strathclyde, United Kingdom

6:15 AM
4861: Visualization of Microcirculation from the Sciatic Nerve of Rat via 40 MHz Ultrasound Localization Microscopy in Compressive Neuropathy Model
De-Quan Chen, Chih-Chung Huang
National Cheng Kung University, Taiwan

6:25 AM
5095: Lipid Phase Distribution and Acoustic Response of DSPE-Based Microbubbles
Simone A.G. Langeveld, Gonzalo Collado-Lara, Gerrit J.W. Wiggers, Antonius F.W. van der Steen, Nico de Jong, Klazina Kooiman
Erasmus MC, Netherlands

6:35 AM
4348: Ultrasound-Guided In Vivo Delivery of Cold Plasma Gas for Cancer Therapy via Microbubbles
Wenyu Guo, Shuo Huang, Jie Dang, Jian An, Feihong Dong, Jue Zhang
Peking University, China

6:45 AM
4357: Freeze-Dried Monodisperse Microfluidic Microbubbles as a Non-Invasive Blood Pressure Sensor
Ugur Soysal{1}, Pedro N Azevedo{1}, Marcio S Carvalho{2}, Amanda C S N Pessoa{3}, Lucimara G de la Torre{3}, Arnaud Tourin{1}, Mathias Fink{1}, Patrick Tabeling{1}
{1}ESPCI Paris, France; {2}PUC-Rio Brazil, Brazil; {3}University of Campinas, Brazil

6:55 AM
4407: Biomimetic PLGA Microbubbles Coated with Platelet Membrane for Early Detection of Myocardial Ischemia-Reperfusion Injury
Lingling Xu, Yali Yang, Yihan Chen, Qiaofeng Jin, Mingxing Xie
wuhan union hospital, China

7:05 AM
4938: Computationally Resolved Super-Resolution Imaging of Microvasculature via Short Length Scanning of Nanobubbles
Mahdi Bayat, Eric Abenojar, Reshani Perera, Agata Exner
Case Western Reserve University, United States

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-08: MBB: Synthetic Transmit Focusing (AM)
Session Chair(s): Svetoslav Nikolov (BK Ultrasound)

5:45 AM
4203: High-Resolution Ultrasound Imaging Using Unified Pixel-Based and Filtered Delay Multiply and Sum Beamforming
Hao Guo{2}, Huiwen Xie{2}, Guangquan Zhou{2}, Nghia Nguyen{1}, Richard Prager{1}
{1}Cambridge University, United Kingdom; {2}Southeast University, China

5:55 AM
4219: A Combination of Pixel-Based Beamforming and Wiener Filter to Improve Ultrasound Image Quality
Hui-Wen Xie{1}, Hao Guo{1}, Guang-Quan Zhou{1}, Nghia Nguyen{2}, Richard Prager{2}
{1}Southeast University, China; {2}University of Cambridge, United Kingdom

6:05 AM
4242: Ultrasound Image Reconstruction by Self-Supervised Deep Neural Network: A Study of Coherent Compounding Strategy
Jingke Zhang, Jianwen Luo
Tsinghua University, China

6:15 AM
4246: A Mixed Sequence of Diverging Wave and Focused Wave for Ultrasound Cardiac Imaging
Jing Liu{2}, Chongchong Guo{2}, Lanxi Xiang{2}, Linfeng Zhao{2}, Wei Feng{2}, Bo Yang{2}, Weibao Qiu{1}
{1}Paul C. Lauterbur Research Center for Biomedical Imaging, Shenzhen Institutes of Advanced Technology, China; {2}Shenzhen Mindray Bio-Medical Electronics Co., Ltd, China

6:25 AM
4560: Synthetic Transmit Beams with Multi-Line and Diverging Wave Transmission for Real-Time, High Frame Rate, Low-Artefact Tissue Doppler Imaging
Alessandro Ramalli, Alessandro Dallai, Francesco Guidi, Valentino Meacci, Piero Tortoli
University of Florence, Italy

6:35 AM
4732: Plane Wave Ultrasound Beamforming Using a Nonuniform Fast Fourier Transform Based on Low Rank Approximation
Bin Zhang, Zhuang Ma, Ning Li, Baozhu Guo
Dalian Neusoft University of Information, China

6:45 AM
5042: A Self-Supervised Deep Learning Approach for High Frame Rate Plane Wave Beamforming with Two-Way Dynamic Focusing
Yinran Chen{2}, Jing Liu{1}, Xiongbiao Luo{2}, Jianwen Luo{1}
{1}Tsinghua University, China; {2}Xiamen University, China

6:55 AM
5049: A Novel Spatio-Temporal DMAS (ST-DMAS) Beamforming for Sparse Synthetic Aperture Ultrasound Imaging: Initial Results
Anudeep Vayyeti, Arun Thittai
IIT Madras, India

7:05 AM
5067: A United Bandpass-Angular Weighting Template for Stolt's f-K in Coherent Plane-Wave Compounding
Chen Yang, Ninghao Wang, Xinze Li, Yang Jiao, Yaoyao Cui
Chinese Academy of Science, Suzhou Institute of Biomedical Engineering and Technology (SIBET), China

7:15 AM
5371: Enhanced Radon Domain Beamforming Using Deep Learning Based Plane Wave Compounding
Gino Evan Jansen, Navchetan Awasthi, Hans-Martin Schwab, Richard Lopata
Eindhoven University of Technology, Netherlands

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-09: MIS: Imaging & Image Enhancement & Decluttering I (AM)
Session Chair(s): Ivan Suarez (Inserm), (Brett Byram (Vanderbilt University)

5:45 AM
4126: 3D Clifford Analytic Signal for 3D Envelope Detection on Ultrasound Volume
Liang Wang, Patrick R. Girard, Patrick Clarysse, Philippe Delachartre
Univ Lyon, INSA-Lyon, Universite Claude Bernard Lyon 1, UJM-Saint Etienne, CNRS, Inserm, CREATIS UMR, France

5:55 AM
4672: MUST: An Open-Source MATLAB Ultrasound Toolbox
Damien Garcia
CREATIS, France

6:05 AM
4954: A Least-Squares Finite Element Method for Regularization of Sparse Displacement Data
Jan-Willem Muller{2}, Hans-Martin Schwab{2}, Marcel Rutten{2}, Marc van Sambeek{1}, Richard Lopata{2}
{1}Catharina Hospital Eindhoven, Netherlands; {2}Eindhoven University of Technology, Netherlands

6:15 AM
5051: Novel POES Method of Recovery for Sparse Synthetic Aperture Ultrasound Acquisition: Preliminary Performance Analysis
Sowmiya Chandramoorthi, Anand Ramkumar, Arun Thittai
IIT Madras, India

6:25 AM
5085: Single Plane-Wave Imaging Using Physics-Based Deep Learning
Georgios Pilikos{1}, Chris de Korte{2}, Tristan van Leeuwen{1}, Felix Lucka{1}
{1}Centrum Wiskunde & Informatica, Netherlands; {2}Radboud University Medical Center, Netherlands

6:35 AM
5191: A Deep Learning Signal-Based Approach to Fast Harmonic Imaging
Mariam Fouad{4}, Mohamed A. Abd El Ghany{2}, Michael Huebner{1}, Georg Schmitz{3}
{1}Brandenburg University of Technology (BTU), Germany; {2}German University in Cairo (GUC), TU Darmstadt (TUD), Egypt; {3}Ruhr University Bochum (RUB), Germany; {4}Ruhr University Bochum (RUB), German University in Cairo (GUC), Germany

6:45 AM
5321: Comparison of Statistical Models for the Detection of Uniform Reverberant Shear Wave Fields
Edmundo Miranda, Benjamin Castaneda, Stefano Romero
Pontificia Universidad Católica del Peru, Peru

6:55 AM
4247: Spatiotemporal Nonlocal Means Based Denoising for Ultrasound Microvascular Imaging
Lijie Huang{2}, Jingke Zhang{2}, Yayu Hao{2}, Linkai Jing{1}, Qiong He{2}, Guihuai Wang{1}, Jianwen Luo{2}
{1}Beijing Tsinghua Changgung Hospital, China; {2}Tsinghua University, China

7:05 AM
4551: Unsupervised Learning for Acoustic Shadowing Artifact Removal in Ultrasound Imaging
Jaeyoung Huh, Shujaat Khan, Jong Chul Ye
Korea Advanced Institute of Science and Technology (KAIST), Korea

7:15 AM
4657: A Novel Method for Depicting Thoracic Spine Using Difference Between Scattering of Muscle Tissues and Reflection at Bone Surface
Mototaka Arakawa, Takumi Hashimoto, Taiga Bando, Shohei Mori, Eiko Onishi, Masanori Yamauchi, Hiroshi Kanai
Tohoku University, Japan

7:25 AM
5196: Convolutional Neural Network Based Blind Estimator of Phase-Aberrated Point Spread Function for Ultrasound Imaging
Wei-Hsiang Shen, Meng-Lin Li
National Tsing Hua University, Taiwan

7:35 AM
5270: SimDeCCom: Simultaneous De-Cluttering and Compression for Real-Time Ultrasound Imaging
Shira Nemirovsky-Rotman, Zvi Friedman, Moshe Porat
Technion, Israel

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-10: MIM: Novel Imaging Methods II (AM)
Session Chair(s): Mohamed Almekkawy (Pennsylvania State University)

5:45 AM
4022: Airborne Ultrasound to Reveal Abnormalities of the Lungs: Imaging Voice-Induced Surface Chest Vibrations
Ros Kiri Ing{1}, Christian Dorme{1}, Marie-Cécile Nierat{2}, Pierantonio Laveneziana{2}, Mathias Fink{1}, Thomas Similowski{2}
{1}Institut Langevin, France; {2}Laboratoire de Neurophysiologie respiratoire expérimentale et clinique, France

5:55 AM
4235: Ultrasonic/Electrical Dual-Mode Fusion Imaging for Human Abdomen
Peixia Li{1}, Gepu Guo{1}, Qingyu Ma{1}, Yuzhi Li{1}, Feng Dong{3}, Juan Tu{2}, Dong Zhang{2}
{1}Nanjing Normal University, China; {2}Nanjing University, China; {3}Tianjing University, China

6:05 AM
4251: Improved Background Noise Suppression in Ultrasound Microvascular Imaging Using Spatial Coherence Beamforming
Lijie Huang, Jingke Zhang, Jianwen Luo
Tsinghua University, China

6:15 AM
4393: Cortical Bone Ultrasonic Imaging Based on Accurate Delay Times
Qinzhen Shi{2}, Yifang Li{2}, Lingwei Shi{2}, Meilin Gu{2}, Yuan Liu{1}, Xin Liu{2}, Dean Ta{2}
{1}e First People's Hospital of Chenzhou, China; {2}Fudan University, China

6:25 AM
4478: Bi-Plane Imaging for a Robust Assessment of Flow Mediated Dilation
Claudio Giangrossi{2}, Alessandro Ramalli{2}, Carlo Palombo{1}, Piero Tortoli{2}
{1}Surgical, Medical, Molecular Pathology & Critical Care Medicine, Univ. of Pisa, Italy; {2}University of Florence, Italy

6:35 AM
4610: No-Cost Uncertainty Estimation for Full Waveform Inversion of the Human Brain
Oscar Bates, Lluis Guasch, Thomas Robins, Oscar Calderón Agudo, George Strong, Carlos Cueto, Javier Cudiero, Mengxing Tang
Imperial College London, United Kingdom

6:45 AM
4944: Pulse Wave Velocity Measurement Along the Ulnar Artery in the Wrist Region Using a High-Frequency Ultrasonic Probe with H-Topology
Maxime Benchemoul{2}, Tony Matéo{2}, David Savéry{2}, Claudine Gehin{1}, Bertrand Massot{1}, Guillaume Ferin{2}, Philippe Vince{2}, Martin Flesch{2}
{1}INL Lyon, France; {2}Vermon SA, France

6:55 AM
5031: Improved Second Harmonic Imaging of Ultrasound Contrast Agents Based on Total Least-Squares Adaptive Filtering
Jingying Zhu{1}, Yufeng Zhang{1}, Kexin Zhang{2}, Xun Lang{3}
{1}Information School, Yunnan University, China; {2}Second Affiliated Hospital of Kunming Medical University, Kunming, China, China; {3}Yunnan University, China

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Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-11: MBF: Blood Flow Imaging III (AM)
Session Chair(s): Solveig Fadnes (Norwegian University of Science and Technology)

5:45 AM
4069: Ultrasound Vector Flow Imaging Compared with Phase Contrast Magnetic Resonance Imaging for Estimating Blood Flow Velocity and Volume Flow in the Common Carotid Artery
Yigang Du{2}, Haiyan Ding{3}, Le He{3}, Linsong Deng{2}, Alfred.C.H Yu{1}, Billy Yiu{1}, Lei Zhu{2}
{1}Schlegel Research Institute for Aging, University of Waterloo, Canada; {2}Shenzhen Mindray Bio-Medical Electronics Co., Ltd., China; {3}Tsinghua University, China

5:55 AM
4197: Experimental Study on the Association Among Flow Profile Shape, Systemic and Local Hemodynamics, and Wave Reflections, Based on Vector Doppler Imaging
Stefano Ricci{1}, Carmela Morizzo{2}, Daniele Mazierli{1}, Piero Tortoli{1}, Michaela Kozakova{2}, Carlo Palombo{2}
{1}University of Florence, Italy; {2}University of Pisa, Italy

6:05 AM
4490: High-Frame-Rate Color Flow Imaging with Enhanced Spatial Resolution in Virtual Real-Time
Francesco Guidi, Claudio Giangrossi, Alessandro Dallai, Alessandro Ramalli, Piero Tortoli
University of Florence, Italy

6:15 AM
4717: Angle-Independent, Contrast-Free Functional Ultrasound Velocimetry Based on Speckle Decorrelation Analysis
Jianbo Tang{3}, Thomas Szabo{1}, Dmitry Postnov{2}, Kivilcim Kilic{1}, Sefik Evren Erdener{1}, Blaire Lee{1}, John Giblin{1}, David Boas{1}
{1}Boston University, United States; {2}Copenhagen University, Denmark; {3}Southern University of Science and Technology, China

6:25 AM
4885: Automatic Quantification of Valvular Insufficiency Using 3D Doppler Imaging and Deep Learning
Sigurd Vangen Wifstad, Lasse Løvstakken, Jørgen Avdal, Hans Torp, Stefano Fiorentini
Norwegian University of Science and Technology, CIUS, Norway

6:35 AM
5124: Integrating Artificial Intelligence and Color Doppler Us for Automatic Hemorrhage Detection
Jhimli Mitra{1}, Michael Macdonald{1}, Prem Venugopal{1}, Kirk Wallace{1}, Hossam Abdou{2}, Michael Richmond{2}, Noha Elansary{2}, Joseph Edwards{2}, Neerav Patel{2}, Jonathan Morrison{2}, Luca Marinelli{1}
{1}GE Global Research, Niskayuna, NY, United States; {2}University of Maryland School of Medicine, Baltimore, MD, United States

6:45 AM
5340: Intraoperative Innovative Sensitive Doppler Imaging Method Reveals Pulsatility of Brain Gliomas
Guillaume Lacoin{1}, Vincent Guyot{1}, Jean-Luc Gennisson{3}, Denis Kouamé{2}, Ilyess Zemmoura{1}, Jean-Pierre Remenieras{1}
{1}iBrain, Université de Tours, INSERM UMR 1253, France; {2}Institut de Recherche en Informatique de Toulouse, UMR CNRS 5505, Université de Toulouse, France; {3}Laboratoire d'imagerie biomédicale multimodale à Paris-Saclay, Université Paris-Saclay, CEA, C

6:55 AM
4249: Contrast-Free Ultrasound Microvascular Imaging for Intraoperative Detection of Human Spinal Cord Tumor: An In Vivo Feasibility Study
Lijie Huang{2}, Yayu Hao{2}, Linkai Jing{1}, Yuanyuan Wang{2}, Qiong He{2}, Guihuai Wang{1}, Jianwen Luo{2}
{1}Beijing Tsinghua Changgung Hospital, China; {2}Tsinghua University, China

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-12: MPA: Photoacoustic Imaging IV (AM)
Session Chair(s): Kelsey Kubelick (Georgia Tech and Emory University)

5:45 AM
4221: Deep Learning Regularized Acceleration for Photoacoustic Image Reconstruction
Jiali Gong, Hengrong Lan, Feng Gao, Fei Gao
ShanghaiTech University, China

5:55 AM
4428: Deep Learning-Based Photoacoustic Imaging of Vascular Network Through Thick Porous Media
Ya Gao, Wenyi Xu, Yiming Chen, Weiya Xie, Qian Cheng
Tongji University, China

6:05 AM
4457: Batch Renormalization Accumulated Residual U-Network for Artifacts Removal in Photoacoustic Imaging
Husnain Shahid{1}, Yaoting Yue{1}, Adnan Khalid{2}, Xin Liu{1}, Dean Ta{1}
{1}Fudan University, China; {2}Northeastern University, China

6:15 AM
5396: SVD Based Improvement of PA/Us Image Quality and Separation of PA Signals from Stationary and Non-Stationary Sources
Roy van Hees, Min Wu, Frans van de Vosse, Richard Lopata, Marcel Rutten
University of Technology Eindhoven, Netherlands

6:25 AM
5194: Closed-Loop Photothermal Therapy System Based on Photoacoustic and Ultrasonic Dual-Mode Temperature Feedback
Yi-Ming Ma, Zhi-Gang Lei, Yuan-Yuan Gao, Ming-Jian Sun
Harbin Institute of Technology, China

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-13: MTH: Hyperthermia, Histotripsy & Immunomodulation I (AM)
Session Chair(s): Mingxi Wan (Xi'an Jiaotong University), William Apoutou NDjin (INSERM)

5:45 AM
4020: Enhanced Histotripsy Using 256-Element Phased Array Combined with Multi-Focus Mode: A Preliminary Study
Mingzhu Lu, Ruixin Li, Jianyun Mao, Xuan Liu, Yi Zhang, Rongzheng Yang, Quan Zhang, Tingting Qi, Mingxi Wan
Xi'an Jiaotong University, China

5:55 AM
4056: Histotripsy Using B-Mode Real-Time Monitoring for the Treatment of In-Vivo Rabbit Kidney Tumors
Mingzhu Lu, Yehui Liu, Rongzheng Yang, Ruixin Li, Tingting Qi, Jianyun Mao, Quan Zhang, Xuan Liu, Mingxi Wan
School of Life Science and Technology, China

6:05 AM
4151: Effective Delivery of DNA Octahedron Nanocages Loading Epirubicin by Ultrasound with Microbubbles Improved Therapeutic Effect on Nude Mice Bearing Intracranial Glioblastoma Xenografts
Yiling Chen{2}, Weifeng Huang{2}, Yi Ma{1}, Xin Chen{2}, Siping Chen{2}, Yuanyuan Shen{2}
{1}China Pharmaceutical University, China; {2}Shenzhen University, China

6:15 AM
4176: Delivery of Arctiin via Ultrasound with Microbubbles Exerted Positive Effects on Motor Function in a Transgenic Mice Model of Amyotrophic Lateral Sclerosis
Lu Xia{2}, Lingchen Hua{2}, Shuneng Sun{2}, Xifei Yang{1}, Xin Chen{2}, Siping Chen{2}, Yuanyuan Shen{2}
{1}Shenzhen Center for Disease Control and Prevention, China; {2}Shenzhen University, China

6:25 AM
4438: Noninvasive Ultrasound Stimulation of Spleen to Treat Autoimmune Myocarditis
Tianshu Liu, Qiaofeng Jin, Li Zhang, Jing Wang, Mingxing Xie
Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

6:35 AM
4544: Skin Perforation Array Created by Focused Ultrasound for Effective Immunization Against Hepatitis B
Yang Mo, Jianpeng Wei, Siping Chen, Xin Chen, Yaxin Hu
Shenzhen University, China

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-14: MTH: Brain & Neuromodulation I (AM)
Session Chair(s): ShinIchiro Umemura (Tohoku University)

5:45 AM
4168: Mitigated Motor Function Impairment by Enhanced Delivery of Edaravone via Ultrasound with Microbubbles in a Transgenic Mice Model of Amyotrophic Lateral Sclerosis
Shuting Peng{2}, Yingtao Liao{2}, Mingxia Wang{2}, Xifei Yang{1}, Xin Chen{2}, Siping Chen{2}, Yuanyuan Shen{2}
{1}Shenzhen Center for Disease Control and Prevention, China; {2}Shenzhen University, China

5:55 AM
4293: Ultrasound Brain Stimulation of Psychiatric Deficient Targets: A Simulation Study
Dapeng Li{2}, Jean-Philippe Cottier{1}, Jean-Michel Escoffre{1}, Mingxi Wan{2}, Siyuan Zhang{2}, Ayache Bouakaz{1}
{1}UMR 1253, iBrain, Université de Tours, Inserm, France, France; {2}Xi'an Jiaotong University, China

6:05 AM
4485: Transcranial Focused Ultrasound Stimulates Nucleus Tractus Solitarius to Regulate Blood Pressure
Fangyuan Cao, Dapeng Li, Chunhao Lai, Tianqi Xu, Mingxi Wan, Siyuan Zhang
Xi'an Jiaotong University, China

6:15 AM
4781: Optimizing Stimulation Paradigms to Improve the Suppression Effect of Ultrasonic Brain Stimulation on Seizures
Jiaqi Xu{1}, Guofeng Li{2}, Zhenzhou Li{1}, Weibao Qiu{2}, Hairong Zheng{2}
{1}Shantou University Medical College, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

6:25 AM
5260: Transmission Efficiency Comparison Between Dual-Mode Conversion Incidence and Normal Incidence
Ki Chang Kang{1}, Young Hun Kim{1}, Kwan Kyu Park{1}, Kamyar Firouzi{2}, Butrus Thomas Khuri-Yakub{2}
{1}Hanyang University, Korea; {2}Stanford University, United States

6:35 AM
4787: Observation of the Blood-Brain Barrier Opening by Ultrasound with Microbubbles on Mice Using Intravital Imaging with Two-Photon Microscopy
Lu Xia, Longyun Hu, Mengni Hu, Xin Chen, Siping Chen, Yuanyuan Shen
Shenzhen University, China

6:45 AM
4750: Motor Cortex Ultrasonic Neurostimulation in Mice: Detailed Procedure and Safety Study
Rasha Noureddine{3}, Alexandre Surget{2}, Tarik Iazourene{2}, Marie Audebrand{2}, Hoda Eliwa{2}, Bruno Brizard{2}, Mohamad Nassereddine{1}, Ayache Bouakaz{2}, Yassine Mofid{2}, Jamal Charara{1}
{1}Lebanese University, Lebanon; {2}UMR 1253, iBrain, Université de Tours, Inserm, France; {3}UMR 1253, iBrain, Université de Tours, Inserm & Lebanese University, Lebanon

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-15: MEL: Elastography Applications (AM)
Session Chair(s): Jean Luc Gennisson (Universite Paris-Saclay)

5:45 AM
4139: Visualization of Human Skeletal Muscle Anisotropy by Using Dual Directions Shear Wave Imaging
Guoxuan Xu, Pei-Yu Chen, Chih-Chung Huang
National Cheng Kung University, Taiwan

5:55 AM
4363: 3D Strain Imaging for Automated Breast Volume Scanner: In-Vivo Validation Study
Gijs Hendriks, Chuan Chen, Hendrik Hansen, Chris de Korte
Radboud university medical center, Netherlands

6:05 AM
4399: 3D Elasticity-Informed Registration of Shear-Wave Elastography with Dynamic Contrast-Enhanced Ultrasound for Multiparametric Prostate Cancer Imaging
Peiran Chen{3}, Simona Turco{3}, Hessel Wijkstra{1}, Arta Dilo{2}, Pintong Huang{4}, Massimo Mischi{3}
{1}Amsterdam University Medical Centers, Netherlands; {2}Angiogenesis Analytics, JADS Venture campus, Netherlands; {3}Eindhoven University of Technology, Netherlands; {4}Second Affiliated Hospital of Zhejiang University, China

6:15 AM
4989: Evaluations of Radiosensitivity and Tumor Microenvironment Stiffness with Shear Wave Elasticity Imaging
Shao-Lun Lu, Wei-Wen Liu, Kun Han, Chia-Hsien Cheng, Pai-Chi Li
National Taiwan University, Taiwan

6:25 AM
4990: SWEI of 3D Cell Cultures for Mechanistic Studies of ECM Stiffness-Mediated Tumor Growth
Wei-Wen Liu, Pai-Chi Li
National Taiwan University, Taiwan

6:35 AM
5120: Quantification of Elastic Properties of Achille's Tendon: A First Step to Explore Muscle-Tendon Structures Exposed to Substantial Injury Incidence
Steve Beuve{1}, Alexandra Flandin{2}, Antoine Nordez{3}, Lilian Lacourpaille{3}, François Hug{3}, Robin Le Galèze{3}, Gael Guilhem{2}, Jean-Luc Gennisson{1}
{1}BioMaps, Université Paris-Saclay, CEA, CNRS, Inserm, France; {2}French Institute of Sport (INSEP), Laboratory Sport, Expertise and Performance, France; {3}Université de Nantes, Mouvement – Interactions – Performance, France

6:45 AM
5342: 3D Ultrasound Strain Imaging of Undamaged and Damaged Puborectal Muscle
Shreya Das{1}, Gijs Hendriks{1}, Catalin Cernat{2}, Frieda van Den Noort{5}, Claudia Manzini{4}, C. Huub van der Vaart{4}, Chris de Korte{3}
{1}Radboud University Medical Center, Netherlands; {2}Radboud University Medical Center / University of Twente, Netherlands; {3}Radboudumc, University of Twente, Netherlands; {4}University Medical Center, Utrecht, Netherlands; {5}University of Twente, Net

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-16: MSD: Novel Devices for Tissue Characterization & Investigation (AM)
Session Chair(s): Enrico Boni (University of Florence), Sevan Harput (London)

5:45 AM
4003: An Ultrasonic Orthopedic Scalpel Based on Sandwich Piezoelectric Transducer
Shibo Zhang{1}, Zhirui Chen{2}, Yongbo Wu{2}, Jiang Zeng{2}
{1}Harbin Institute of Technology, China; {2}Southern University of Science and Technology, China

5:55 AM
4237: An Amplitude Modulation Ultrasonic Backscatter Method for Estimation Characterization of Cancellous Bones
Boyi Li, Chengcheng Liu, Ying Li, Tho N.H.T. Tran, Dean Ta
Fudan University, China

6:05 AM
4540: Applying Pulse-Compression Method to Acoustic Stimulated Electromagnetic Measurements
Kazuma Ito, Nobuo Niimi, Kenji Ikushima
Tokyo University of Agriculture and Technology, Japan

6:15 AM
4542: 3D Transcranial Cavitation Localization Using Four Sensors
Zhongtao Hu, Lu Xu, Chih-Yen Chien, Yaoheng Yang, Yan Gong, Dezhuang Ye, Christopher Pacia, Hong Chen
Washington University in St. Louis, United States

6:25 AM
4912: Needle Tip Geometry of Ultrasound-Enhanced Fine Needle Biopsy Influences Needle Tip Deflection
Saif Bunni, Heikki Nieminen
Aalto University, Finland

6:35 AM
5158: Ultrasound-Enhanced Fine-Needle Aspiration Biopsy Provides Improved Yield in Human Tissue
Yohann Le Bourlout{1}, Minna Rehell{2}, Emanuele Perra{1}, Jouni Rantanen{1}, Nick Hayward{1}, Gösta Ehnholm{1}, Jaana Rautava{2}, Jussi Tarkkanen{2}, Timo Atula{2}, Katri Aro{2}, Heikki Nieminen{1}
{1}Aalto University, Finland; {2}Helsinki University Hospital, Finland

6:45 AM
5444: Comparison of Fresnel Lens-Based Focused Vortex Transducer and Focused Transducer for Neurostimulation
Young Hun Kim{1}, Ki Chang Kang{1}, Kwan Kyu Park{2}, Kamyar Firouzi{1}, Butrus Thomas Khuri-Yakub{2}
{1}Hanyang University, Korea; {2}Stanford University, United States

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Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-17: AME: Materials & Evaluation I (AM)
Session Chair(s): Marta Clement (Polytechnic University of Madrid), Ryo Nakagawa (Murata Manufacturing)

5:45 AM
4387: Evaluation of BAW and SAW Properties of (K,Na)NbO3 Thin Films Deposited by RF Sputtering
Kazuma Yoshizawa{5}, Masashi Suzuki{5}, Shoji Kakio{5}, Yoshiharu Ito{2}, Akinori Tateyama{4}, Hiroshi Funakubo{4}, Tsuyoshi Wakabayashi{1}, Kenji Shibata{3}
{1}Koike Co., Ltd., Japan; {2}Nihon University, Japan; {3}SCIOCS Co., Ltd., Japan; {4}Tokyo Institute of Technology, Japan; {5}University of Yamanashi, Japan

5:55 AM
4871: Analysis of Higher-Order Mode Saw Propagation Characteristics on Polarity Inverted ScAlN Films / High Velocity III-V Nitride Substrate
Yusei Takano, Masashi Suzuki, Shoji Kakio
University of Yamanashi, Japan

6:05 AM
4933: Structural Characterization of the Abnormal Grains Evolution in Sputtered ScAlN Films
Minghua Li, Kan Hu, Huamao Lin, Yao Zhu
Institute of Microelectronics, Singapore

6:15 AM
5108: Low-Loss SAW Devices with LiTaO3 on Extremely High-Resistance Substrate
Jinbo Wu{1}, Shibin Zhang{1}, Hongyan Zhou{1}, Liping Zhang{1}, Pengcheng Zheng{1}, Zhongxu Li{1}, Yuxi Wang{2}, Kai Huang{1}, Tiangui You{1}, Tao Wu{2}, Xin Ou{1}
{1}Shanghai Institute of Microsystem and Information Technology, China; {2}ShanghaiTech University, China

6:25 AM
5487: Effect of Lateral Propagation on Extraction of Mechanical Q Factor of the Piezoelectric Films Without Removing Substrate
Yuki Shimizu, Takahiko Yanagitani
Waseda University, Japan

6:35 AM
5109: 0.1 mm Thick ScAlN Film: Application to MHz Transducer and Precise Lattice Constant Measurement
Ningrui Bai, Takahiko Yanagitani
Waseda University, Japan

6:45 AM
5463: Effect of Epitaxial Stress in PbTiO3 Epitaxial Film Resonators on kt^2 Hysteresis Curve
Sota Kuninobu, Naoya Iwata, Takahiko Yanagitani
Waseda University, Japan

6:55 AM
5496: Precise Extraction of kt^2 for Piezoelectric Film/Substrate Structure by Unembedding Parasitic Inductance
Keita Kondo, Takahiko Yanagitani
Waseda University, Japan

7:05 AM
5505: Comparison of the kt^2 Extraction Methods of Piezoelectric Films in Film/Substrate Structure and Self-Standing Film Structure
Yuki Shimizu, Keita Kondo, Takahiko Yanagitani
Waseda University, Japan

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-18: PAT: Acoustic Tweezers & Particle Manipulation II
Session Chair(s): Ji Wang (Ningbo University, China)

5:45 AM
4377: Development of On-Demand Sample Loading of Ultrasound Acoustic Levitators by Focused Acoustic Radiation
Michal Kepa, Takashi Tomizaki, Soichiro Tsujino
Paul Scherrer Institute PSI, Switzerland

5:55 AM
4379: Creation of Large Quiet Zones in the Presence of Acoustical Levitation Traps
Carl Andersson, Jens Ahrens
Chalmers University of Technology, Sweden

6:05 AM
4477: Development of Promising Acoustic Levitation Technique by Alternating Acoustic Focal Spots Rapidly
Fu Sung Lin, Po-Wei Yang, Ching-Chuan Hsieh, Hsin-Yi Su, Li-Xiang Chen, Chin-Ying Li, Chih-Hsien Huang
National Cheng-Kung University, Taiwan

6:15 AM
4479: Single-Sided Acoustic Levitation Based on Array of Focused Ultrasound Transducers
Longlong Wei, Guanjun Yin, Jianzhong Guo
Shaanxi Normal University, China

6:25 AM
5060: Acoustic Vortex Field Generated by Concentric Circular Array
Jiaxi Yue, Xiaofeng Zhang
Shaanxi Normal University, China

6:35 AM
4155: Parallel Trapping and Controllable Lysis of Cells Using Acoustic Pillar Array Chip
Guanyu Zhang{1}, Shuchang Liu{1}, Shupeng Ning{1}, Weiwei Cui{1}, Mark Reed{2}
{1}Tianjin University, China; {2}Yale University, United States

6:45 AM
4422: The Feasibility and Design of Multifrequency Acoustic Traps
Charles Courtney
University of Bath, United Kingdom

6:55 AM
4579: Man-Machine Interactive Ultrasonic Levitation System Based on Combination of Phased Array and Real-Time Phase Calculating Module
Shaozhe Zhang, Huan Han, Xinlei Cheng, Jiayue Dai, Guanjun Yin, Jianzhong Guo
Shaanxi Normal University, China

7:05 AM
5265: Particle Trajectories and Transverse Dispersion in Acoustic Microfluidic Devices
Gergely Simon{1}, Gergely B. Hantos{2}, Matěj Hejda{3}, Anne L. Bernassau{2}, Marc P. Y. Desmulliez{2}
{1}Edinburgh Instruments, United Kingdom; {2}Heriot-Watt University, United Kingdom; {3}University of Strathclyde, United Kingdom

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Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-19: MIS: Segmentation/Image Processing (AM)
Session Chair(s): Olivier Bernard (CREATIS - Université Claude Bernard Lyon 1)

5:45 AM
4037: Real-Time Temporal Coherent Left Ventricle Segmentation Using Convolutional LSTMs
Erik Smistad{2}, Ivar Mjåland Salte{3}, Håvard Dalen{4}, Lasse Løvstakken{1}
{1}Norwegian University of Science and Technology, Norway; {2}Norwegian University of Science and Technology & SINTEF Medical Technology, Norway; {3}Sørlandet Hospital & University of Oslo, Norway; {4}St. Olavs Hospital & Norwegian University of Science a

5:55 AM
4038: Real-Time 3D Left Ventricle Segmentation and Ejection Fraction Using Deep Learning
Erik Smistad{2}, Erik Nikolai Steinsland{1}, Lasse Løvstakken{1}
{1}Norwegian University of Science and Technology, Norway; {2}Norwegian University of Science and Technology & SINTEF Medical Technology, Norway

6:05 AM
4043: Real-Time Segmentation of Blood Vessels, Nerves and Bone in Ultrasound-Guided Regional Anesthesia Using Deep Learning
Erik Smistad{2}, Kaj Fredrik Johansen{3}, Torgrim Lie{1}
{1}SINTEF Medical Technology, Norway; {2}SINTEF Medical Technology & Norwegian University of Science and Technology, Norway; {3}St. Olavs Hospital, Norway

6:15 AM
4328: Automatic Segmentation of Median Nerve in Ultrasound Image by a Combined Use of Unet and VGG16
A Huang{1}, Q Wang{1}, L Jiang{2}, J Zhang{2}
{1}School of Biomedical Engineering, Southern Medical University, China; {2}Third Affiliated Hospital, Sun Yat-Sen University, China

6:25 AM
4343: Automatic Segmentation of the Optic Nerve in Transorbital Ultrasound Images Using a Deep Learning Approach
Kristen Meiburger{1}, Andrea Naldi{3}, Francesco Marzola{1}, Piergiorgio Lochner{2}
{1}Politecnico di Torino, Italy; {2}Saarland University Medical Center, Germany; {3}Università degli Studi di Torino, Italy

6:35 AM
4491: A Novel Framework for Placental Mega Volume Segmentation
Soumabha Bhowmick{2}, Mayuresh Girish Wagh{2}, Celine Firtion{2}, Subhendu Seth{2}, Pallavi Vajinepalli{2}, Ravindranath Radhakrishnan{2}, Deep Bera{2}, Suresh Seshadri{1}, Nagalakshmi V{1}, Sujatha R{1}
{1}Mediscan, India; {2}Philips, India

6:45 AM
4722: Deep Learning Based Real-Time Segmentation in Ultrasonic Imaging Following the Doctor's Voice Guide
Fei Dai, Yifang Li, Qinzhen Shi, Xiaojun Song, Xin Liu, Dean Ta
Fudan University, China

6:55 AM
5104: Lumen and Media-Adventitia Border Detection in Intravascular Ultrasound Using a Coarse-to-Fine Annotation Strategy
Peng Song{2}, Junbo Li{2}, Jing Yang{1}
{1}Shanghai Xuhui Central Hospital, Zhongshan Hospital of Fudan University, China; {2}Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Science, China

7:05 AM
4724: A Systematic Approach to Improve Support Vector Machine Applied Ultrasonic Guided Wave Spectrum Image Classification
Diego Miranda, Rodrigo Olivares, Roberto Munoz, Jean-Gabriel Minonzio
Escuela de Ingeniería en Informática, Universidad de Valparaíso, Chile

7:15 AM
4937: Needle Tip Detection by Using Correlation Matrix of Aperture Data and Coherence Factor
Hsiao-Liang Cheng, Chi-Wei Yang, Pai-Chi Li
National Taiwan University, Taiwan

7:25 AM
4160: Enhancement of Layered and Fibrous Structure by Constrained Least-Square Estimator
Hideyuki Hasegawa, Michiya Mozumi, Masaaki Omura, Ryo Nagaoka
University of Toyama, Japan

Tuesday, September 14: 5:45 AM - 7:45 AM (Eastern Time)
C1P-20: MBB: Coherence & Deep Learning Beamformers (AM)
Session Chair(s): Rudd van Sloun (Eindhoven University of Technology)

5:45 AM
4044: Deep Algorithm Unfolding for Sub-Nyquist Ultrasound Imaging
Alon Mamistvalov{2}, Israel Aharony{1}, Yonina C. Eldar{2}
{1}Haemek Medical Center, Israel; {2}Weizmann Institute of Science, Israel

5:55 AM
4191: Polar Coordinate Coherent Passive Acoustic Beamforming for the Modifiable Improvement of Image Quality and Field of View
Chunqi Li, Harry R. Clegg, Thomas M. Carpenter, Luzhen Nie, David M. J. Cowell, Steven Freear, James R. McLaughlan
School of Electronic and Electrical Engineering, University of Leeds, United Kingdom

6:05 AM
4405: Flexible Ultrasound Array Shape Estimation Using Phase Coherence (WITHDRAWN)
Marcus Ingram, Jan D'Hooge
KU Leuven, Belgium

6:15 AM
4965: A New Extension of DMAS Ultrasound Nonlinear Beamformer Using Degree 3 Terms with Low Computational Complexity
Leila Eslami{2}, Fatemeh Makouei{1}, Seyyed Abbas Shahkaram{2}, Babak Mohammadzadeh Asl{2}
{1}Rigshospitalet, Denmark; {2}Tarbiat Modares University, Iran

6:25 AM
5132: Sparse Covariance Matrix Based Coherence Beamforming Strategies in Medical Ultrasound
Xiang Wu, Jinyan Wang, Jianfeng Lu, Jiawei Huang, Xin Chen, Siping Chen, Rui Mao, Minhua Lu
Shenzhen University, China

6:35 AM
5335: Generalization of a Deep Learning Network for Beamforming and Segmentation of Ultrasound Images
Silvia Seoni{1}, Giulia Matrone{2}, Nicola Casali{1}, Edoardo Spairani{2}, Kristen Meiburger{1}
{1}Politecnico di Torino, Italy; {2}University of Pavia, Italy

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Tuesday, September 14: 8:00 AM - 9:30 AM (Eastern Time)
C2L-01: Immunostimulation Special Session
Session Chair(s): Richard Price (University of Virginia)

8:00 AM
4765: Promoting the Cancer Immunity Cycle with Focused Ultrasound
Richard Price
University of Virginia, United States

8:30 AM
4793: The Use of Focused Ultrasound in the Treatment of Pancreatic Ductal Adenocarcinoma
Petros Mouratidis, Gail Ter Haar
Institute of Cancer Research, United Kingdom

9:00 AM
4962: Anti-Tumor Immune Implications of Histotripsy Focused Ultrasound Ablation
Clifford Cho
University of Michigan Medical School, United States

Tuesday, September 14: 8:00 AM - 9:30 AM (Eastern Time)
C2L-02: MTC: Quantitative Ultrasound in Cardiopulmonary Applications
Session Chair(s): Aiguo Han (University of Illinois Urbana-Champaign)

8:00 AM
5177: Leveraging Scattering to Unlock Lung Quantitative Ultrasound
Marie Muller
North Carolina State Unversity, United States

8:30 AM
4106: In Vivo Quantification of Pulmonary Fibrosis in Rats Using the Backscatter Coefficient and Envelope Statistics
Theresa Lye{1}, Roshan Roshankhah{2}, Yasamin Karbalaeisadegh{2}, Stephanie Montgomery{4}, Thomas Egan{4}, Marie Muller{2}, Jonathan Mamou{3}
{1}F.L. Lizzi Center for Biomedical Engineering, Riverside Research, United States; {2}North Carolina State University, United States; {3}Riverside Research, United States; {4}University of North Carolina at Chapel Hill, United States

8:45 AM
4315: Quantitative Analysis of Pleural Line and B-Lines in Lung Ultrasound Images for Severity Assessment of COVID-19 Pneumonia
Yuanyuan Wang{2}, Yao Zhang{1}, Qiong He{2}, Jianwen Luo{2}
{1}Beijing Ditan Hospital, Capital Medical University, China; {2}Tsinghua University, China

9:00 AM
5328: In Vivo Acoustoelectric Cardiac Imaging of 4D Electrical Activation in Swine
Alexander Alvarez, Teodoro Trujillo, Chet Preston, Russell Witte
University of Arizona, United States

9:15 AM
4994: Concurrent Ultrasound and Photoacoustic Observations on the Spatiotemporal Changes of Oxygen Saturation Associated with Red Blood Cell Aggregate Size in the Human Radial Artery
Taehoon Bok{1}, Eno Hysi{2}, Michael Kolios{1}
{1}Ryerson University, Canada; {2}St. Michael's Hospital, Canada

Tuesday, September 14: 8:00 AM - 9:30 AM (Eastern Time)
C2L-03: MIS: Imaging I
Session Chair(s): Kailiang Xu (Fudan University), Adrian Basarab (University of Toulouse)

8:00 AM
5437: Automated Electromechanical Wave Imaging at Reduced Frame Rates During Sinus Rhythm Using Machine Learning
Melina Tourni, Lea Melki, Elisa Konofagou
Columbia University, United States

8:15 AM
4408: Semi-Supervised Annotation of Transcranial Doppler Ultrasound Micro-Embolic Data
Yamil Vindas{2}, Emmanuel Roux{2}, Blaise Kévin Guépié{3}, Marilys Almar{1}, Philippe Delachartre{2}
{1}Atys Medical, France; {2}Biomedical Imaging Research Lab CREATIS, France; {3}Université de Technologie de Troyes, France

8:30 AM
4290: Cardiac Strain Imaging Using Coherent Bistatic Dual-Probe Ultrafast Ultrasound
Peilu Liu, Jan-Willem Muller, Hans-Martin Schwab, Richard Lopata
Eindhoven University of Technology, Netherlands

8:45 AM
4589: 3D Ultrasound Matrix Imaging for Aberration Correction Over Multiple Isoplanatic Patches
Flavien Bureau{1}, William Lambert{2}, Arthur Le Ber{1}, Mathias Fink{1}, Alexandre Aubry{1}
{1}Institut Langevin, France; {2}Supersonic Imagine, France

9:00 AM
4830: Recovery of Full Synthetic Transmit Aperture Dataset with Well-Preserved Phase Information by Self-Supervised Deep Learning
Jingke Zhang, Yuanyuan Wang, Jianwen Luo
Tsinghua University, China

9:15 AM
5291: Quantification of Skeletal Muscle Fiber Orientation in 3D Ultrasound B-Modes
Felix Jin, Courtney Trutna, Anna Knight, Lisa Hobson-Webb, Kathryn Nightingale, Mark Palmeri
Duke University, United States

Tuesday, September 14: 8:00 AM - 9:30 AM (Eastern Time)
C2L-04: TMI: Large Arrays
Session Chair(s): Qifa Zhou (University of Southern California), Weibao Qui (henzhen Institutes of Advanced Technology, Chinese Academy of Sciences)

8:00 AM
5187: Rectangular 1014 Element Matrix Array for Transperineal Imaging
Daniel Speicher, Sarah Therre, Holger Hewener, Steffen Tretbar, Marc Fournelle
Fraunhofer IBMT, Germany

8:15 AM
5282: Modular Large Array for Liver Cancer Imaging in Handheld Form Factor
Robert Wodnicki{2}, Haochen Kang{2}, Junhang Zhang{2}, Josquin Foiret{1}, Christophe Notard{3}, Leong Ratsimandresey{3}, Philippe Auclair{3}, Qifa Zhou{2}, Katherine Ferrara{1}
{1}Stanford University, United States; {2}University of Southern California, United States; {3}Vermon, France

8:30 AM
5062: Elasticity Mapping of Acoustic Radiation Force Optical Coherence Elastography with 1.5 MHz 2D Ring Array
Haochen Kang{2}, Fengyi Zhang{1}, Robert Wodnicki{2}, Yizhe Sun{2}, Xuejun Qian{2}, Yan Li{1}, Zhongping Chen{1}, Qifa Zhou{2}
{1}University of California, Irvine, United States; {2}University of Southern California, United States

8:45 AM
5481: Initial Evaluation of a 2.0 MHz 384-Element Phased Array for Improved Imaging of Deep Targets
Josquin Foiret, Hanna Bendjador, Katherine Ferrara
Stanford University, United States

9:00 AM
4878: Development of a 1.5-D Circular Array Transducer for In Vivo Endoscopic Ultrasonography
Qi Zhang{2}, Teng Ma{2}, Qingyuan Tan{2}, Jiamei Liu{2}, Weicen Chen{1}, Jiqing Huang{2}, Shuang Lei{2}, Yongchuan Li{2}, Xiaojing Long{2}, Congzhi Wang{2}, Dawei Wu{1}, Hairong Zheng{2}
{1}Nanjing University of Aeronautics and Astronautics, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

9:15 AM
4884: Development of a Transformable Ultrasonic Transducer (TUT) for Multi-Scale Imaging
Qi Zhang, Teng Ma, Congzhi Wang, Xiangli Liu, Yongchuan Li, Yu Chang, Jiamei Liu, Jiqing Huang, Yang Xiao, Tingrui Pan, Hairong Zheng
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

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Tuesday, September 14: 8:00 AM - 9:30 AM (Eastern Time)
C2L-05: MIM: Super-Resolution Imaging I (AM)
Session Chair(s): Mickael Tanter (INSERM), Shigao Chen (Mayo Clinic)

8:00 AM
4997: Towards In Vivo Real-Time Super-Resolution Imaging with Nanodroplets: (Fast)AWSALM
Kai Riemer, Matthieu Toulemonde, Marcelo Lerendegui, Peter D Weinberg, Christopher Dunsby, Meng-Xing Tang
Imperial College London, United Kingdom

8:15 AM
4621: Functional Assessment of Coronary Microcirculation in Beating Rat Hearts Using 3D Ultrasound Localization Microscopy
Oscar Demeulenaere, Philippe Mateo, Zulma Sandoval, Olivier Villemain, Charlie Demené, Thomas Deffieux, Mickael Tanter, Clément Papadacci, Mathieu Pernot
Physics for Medicine, France

8:30 AM
5320: 3D Spatiotemporal Ultrasound Localization Microscopy Using Deep Learning
Brice Rauby, Jonathan Porée, Hatim Belgharbi, Chloé Bourquin, Maxime Gasse, Jean Provost
Polytechnique Montréal, Canada

8:45 AM
4977: Microbubble Uncoupling via Transmit Excitation (MUTE): A Novel Method for Enhanced Ultrasound Localization Microscopy
Jihun Kim, Matthew Lowerison, Pengfei Song
University of Illinois at Urbana-Champaign, United States

9:00 AM
4394: Ultrasound Super-Resolution Imaging Enables Multiparameter Analyses of Tumor Angiogenesis During Growth
Jingyi Yin{1}, Feihong Dong{1}, Jian An{1}, Jiabin Zhang{2}, Jue Zhang{1}
{1}Academy for Advanced Interdisciplinary Studies, Peking University, Beijing, China; {2}Institute of Molecular Medicine, Peking University, Beijing, China

9:15 AM
4647: Improved 3D Ultrasound Localization Microscopy Using 3D Kalman Filtering-Based Tracking
U Wai Lok{1}, Chengwu Huang{1}, Joshua D. Trzasko{1}, Shanshan Tang{1}, Ping Gong{1}, Yohan Kim{1}, Fabrice Lucien{1}, Pengfei Song{2}, Shigao Chen{1}
{1}Mayo clinic, United States; {2}University of Illinois at Urbana-Champaign, United States

Tuesday, September 14: 10:00 AM - 11:30 AM (Eastern Time)
C3L-01: Clinical Special Session
Session Chair(s): Tim Ziemlewicz (University of Wisconsin), Steven Freear (University of Leeds)

10:00 AM
4300: Contrast Enhanced Ultrasound from Diagnostics to the Therapy
Pintong Huang, Chao Zhang
Second Affiliated Hospital of Zhejiang University School of medicine, China

10:30 AM
5522: Improving B-Mode Ultrasound Diagnostic Performance for Focal Liver Lesions Using Deep Learning: A Multicentre Study
Ping Liang{1}, Qi Yang{3}, Jie Yu{1}, Jie Tian{2}
{1}Fifth Medical Center of Chinese PLA General Hospital, China; {2}Key Laboratory of Molecular Imaging, Institute of Automation, Chinese Academy of Sciences, China; {3}Peking University Shenzhen Hospital, China

11:00 AM
4864: Towards a tumor-Free world: When Ultrasound Meets Immunotherapy
Hui-Xiong Xu
Shanghai Tenth People's Hospital, China

Tuesday, September 14: 10:00 AM - 11:30 AM (Eastern Time)
C3L-02: MBB: Beamforming I
Session Chair(s): Wei-Ning Lee (The University of Hong Kong)

10:00 AM
4616: Refraction-Corrected Trans-Temporal Ultrasound Imaging Using a Commercial Probe
Moein Mozaffarzadeh{1}, Martin D. Verweij{1}, Verya Daeichin{1}, Nico de Jong{2}, Guillaume Renaud{1}
{1}Delft University of Technology, Netherlands; {2}Delft University of Technology and Erasmus MC, Netherlands

10:15 AM
5198: Estimating Mean Speed-of-Sound from Sequence-Dependent Geometric Disparities
Xenia Augustin, Lin Zhang, Orcun Goksel
ETH Zurich, Switzerland

10:30 AM
4995: Side Lobe Reduction Using Null Subtraction Imaging
Zhengchang Kou, Michael Oelze
University of Illinois Urbana-Champagin, United States

10:45 AM
4964: Frequency-Selective Coherent Compounding in Spatial Coherence-Based Beamforming
James Long, Rifat Ahmed, Gregg Trahey
Duke University, United States

11:00 AM
4919: Phase Constraint Improves Ultrasound Image Quality Reconstructed Using Deep Neural Network
Hao Zuo{1}, Jingke Zhang{2}, Jianwen Luo{2}, Bo Peng{1}
{1}Southwest Petroleum University, China; {2}Tsinghua University, China

11:15 AM
4337: Partial Hadamard Encoded Synthetic Transmit Aperture for High Frame Rate Imaging with Minimal Norm Least Square Reconstruction Method
Jing Liu{3}, Yuanyuan Wang{2}, Jianwen Luo{2}, Wei Fan{3}, Weibao Qiu{1}
{1}Paul C. Lauterbur Research Center for Biomedical Imaging, Shenzhen Institutes of Advanced Technology, China; {2}School of Medicine, Tsinghua University, China; {3}Shenzhen Mindray Bio-Medical Electronics CO., LTD, China

Tuesday, September 14: 10:00 AM - 11:30 AM (Eastern Time)
C3L-03: MIS: Imaging II
Session Chair(s): Nicholas Bottenus (University of Colorado Boulder)

10:00 AM
4338: Semi-Supervised Deep Learning for Breast Anatomy Decomposition in Ultrasound Images
Yongshuai Li{1}, Yuan Liu{3}, Zhili Wang{2}, Jianwen Luo{1}
{1}Biomedical Engineering, School of Medicine, Tsinghua University, China; {2}Chinese PLA General Hospital, China; {3}Fifth Medical Center of Chinese PLA General Hospital, China

10:15 AM
5130: Unsupervised Domain Adaptation Method for Segmenting Cross-Sectional CCA Images
Luuk van Knippenberg{2}, Joerik de Ruijter{2}, Arthur Bouwman{1}, Richard Lopata{2}, Ruud van Sloun{2}, Massimo Mischi{2}
{1}Catharina Hospital Eindhoven, Netherlands; {2}Eindhoven University of Technology, Netherlands

10:30 AM
4648: The Influence of Intra-Cortical Porosity on the Contrast in Ultrasound Images of the Bone Cortex
Amadou Sall Dia{2}, Guillaume Renaud{1}, Quentin Grimal{2}
{1}Delft University of Technology, Netherlands; {2}Sorbonne Universite, INSERM, CNRS, Laboratoire dImagerie Biomedicale, LIB, F-75006 Paris, France

10:45 AM
4859: An Intrinsic Shape Estimation Algorithm for Flexible Ultrasound Probes Intended for Clinical Applications
Amirhossein Omidvar, Robert Rohling, Edmond Cretu, Mark Cresswell, Antony J Hodgson
University of British Columbia, Canada

11:00 AM
4942: Compressed Ultrasound Reconstruction Through Jointly Learned Analog-to-Digital Conversion and Adaptive Beamforming
Ben Luijten{2}, Nir Shlezinger{1}, Ariel Amar{3}, Massimo Mischi{2}, Yonina C. Eldar{3}, Ruud van Sloun{2}
{1}Ben Gurion University of the Negev, Israel; {2}Eindhoven University of Technology, Netherlands; {3}Weizmann Institute of Science, Israel

11:15 AM
5223: Multi-GPU Reconstruction as a Practical Tool for Video-Rate Volumetric Ultrasound Imaging
Eun-Yeong Park{2}, Josquin Foiret{2}, Chulhong Kim{1}, Katherine Ferrara{2}
{1}Pohang University of Science and Technology, Korea; {2}Stanford University, United States

Tuesday, September 14: 10:00 AM - 11:30 AM (Eastern Time)
C3L-04: TMU: CMUT
Session Chair(s): Dominique Certon (Université de Tours), Omer Oralkan (NC State University)

10:00 AM
4948: Acoustic Charcterization and InVitro Evaluation of a Preclinical Dual-Mode CMUT Probe for Endocavitary Ultrasound-Guided HIFU Therapy
Ivan Suarez-Castellanos{2}, Geoffroy de Sallmard{2}, Alice Ganeau{2}, Thomas Payen{3}, Jean-Yves Chapelon{2}, Nicolas Guillen{1}, Nicolas Sénégond{4}, William Apoutou N'Djin{2}
{1}EDAP-TMS, France; {2}LabTAU, INSERM, Centre Léon Bérard, Université de Lyon, France; {3}LabTAU, INSERM, Centre Léon Bérard, Université de Lyon, 2EDAP TMS, France; {4}VERMON, France

10:15 AM
4520: 190+190 Row–Column Addressed CMUT Probe for Volumetric Imaging
Rune Sixten Grass{3}, Mathias Engholm{3}, Andreas Spandet Havreland{3}, Christopher Beers{1}, Martin Lind Ommen{3}, Stine Løvholt Grue Pedersen{3}, Lars N. Moesner{1}, Lasse Thurmann Jørgensen{3}, Mikkel Schou{3}, Sigrid Husebø Øygard{3}, Matthias Bo Stua
{1}BK Medical, United States; {2}Technical University of Denmark, Denmark; {3}Technical University of Denmark - Health Technology, Denmark

10:30 AM
5385: Analysis and Demonstration of End-to-End Parametric Resonance Based Ultrasonic Power Transfer
Charles Wei, Sushruta Surappa, Levent Degertekin
Georgia Institute of Technology, United States

10:45 AM
5473: Design and Fabrication of 1D CMUT Arrays for Dual-Mode Acoustic Angiography Applications - Preliminary Results
Muhammetgeldi Annayev{1}, Oluwafemi J. Adelegan{2}, Feysel Yalcin Yamaner{1}, Paul Dayton{3}, Ömer Oralkan{2}
{1}NC State University, United States; {2}North Carolina State University, United States; {3}University of North Carolina at Chapel Hill and North Carolina State University, United States

11:00 AM
4991: Fabrication and Characterization of Flexible Transparent CMUT Arrays for Photoacoustic Applications
Mahyar Ghavami, Afshin Kashani Ilkhechi, Mohammad Maadi, Eric Dew, Roger Zemp
University of Alberta, Canada

11:15 AM
4856: Flexible Polymer-Based Capacitive Micromachined Ultrasound Transducers (polyCMUTs): Fabrication and Characterization
Amirhossein Omidvar, Carlos D Gerardo, Robert Rohling, Edmond Cretu, Antony J Hodgson
University of British Columbia, Canada

Tuesday, September 14: 10:00 AM - 11:30 AM (Eastern Time)
C3L-05: MIM: Novel Imaging Methods I
Session Chair(s): Gianmarco Pinton (University of North Carolina), Wei-Ning Lee (The University of Hong Kong)

10:00 AM
4923: Randomly Sparse Reception with Channel-Domain Signal Recovery for High-Volume-Rate Ultrasound Imaging
Dan Ran, Wei-Ning Lee
University of Hong Kong, China

10:15 AM
4741: Simultaneous Multispectral Optoacoustic Tomography and Ultrafast Ultrasound Doppler Using a Linear Ultrasound Array for Bimodal Preclinical Imaging
Mitradeep Sarkar{5}, Mailyn Pérez Liva{5}, Gilles Renault{4}, Vasilis Ntziachristos{1}, Bertrand Tavitian{2}, Jérôme Gateau{3}
{1}Chair of Biological Imaging (CBI), School of Medicine, Technical University of Munich, Germany; {2}Radiology Department, AP-HP, Hôpital européen Georges Pompidou, France; {3}Sorbonne Université, CNRS, INSERM, Laboratoire d'Imagerie Biomédicale, LIB, Fr

10:30 AM
5207: Coherent Multi-Perspective 3D Ultrasound Imaging Using Bistatic Sparse Apertures
Hein de Hoop, Marieke Vermeulen, Hans-Martin Schwab, Richard Lopata
Eindhoven University of Technology, Netherlands

10:45 AM
5418: Correlation of Symptomatology of Stroke with Simultaneous Measurements of Pulse Wave Velocity, Vector Flow Field and Wall Shear Stress in Carotid Artery Disease Patients In Vivo
Grigorios Marios Karageorgos, Rachel Weber, Changhee Lee, Nirvedh Meshram, Paul Kemper, Elisa Konofagou
Columbia University, United States

11:00 AM
5357: Three-Dimensional Contrast Pulse Sequence Ultrasound Imaging for Real-Time Monitoring of Ultrasound-Mediated Gene Delivery
Hanna Bendjador{2}, Josquin Foiret{2}, Zoe Krut{1}, Zulma Gazit{1}, Gadi Pelled{1}, Dan Gazit{1}, Katherine Ferrara{2}
{1}Cedars-Sinai Medical Center, United States; {2}Stanford University, United States

11:15 AM
5103: Diagnostic Lung Imaging Simulations Using Human Body Wall and Alveolar Anatomy with Fullwave
Danai Eleni Soulioti, Oleksii Ostras, Gianmarco Pinton
UNC Chapel Hill, United States

Tuesday, September 14: 11:45 AM - 1:15 PM (Eastern Time)
C4L-01: MBE: Tissue-Ultrasound Interactions
Session Chair(s): Alfred Yu (University of Waterloo)

11:45 AM
5281: Focused-Ultrasound Blood-Brain Barrier Opening Induces Microglia Proliferation
Alina Kline-Schoder, Sana Chintamen, Rebecca Noel, Vilas Menon, Steve Kernie, Elisa Konofagou
Columbia University, United States

12:00 PM
5348: Microbubble Shell Properties and Ultrasound Excitation Frequency Can Modulate the Blood-Brain Barrier Phenotype
Yutong Guo, Hohyun Lee, Costas Arvanitis
Georgia Institute of Technology, United States

12:15 PM
4754: Sonothermogenetics for Noninvasive and Cell-Type Specific Deep Brain Neuromodulation
Yaoheng Yang{2}, Christopher Pacia{3}, Dezhuang Ye{2}, Lifei Zhu{2}, Hongchae Baek{2}, Yimei Yue{2}, Jinyun Yuan{2}, Mark Miller{2}, Jianmin Cui{2}, Joseph Culver{2}, Michael Bruchas{1}, Hong Chen{2}
{1}University of Washington, United States; {2}Washington University in st louis, United States; {3}Washington University in St. Louis, United States

12:30 PM
5005: Using Passive Acoustic Mapping to Characterize Ultrasound Gated Nanoparticles
Aparna Singh{2}, Ralph Xiang{1}, Michelle Sigona{2}, Mahaveer Purohit{1}, Alex Hart{1}, Niloufar Hosseini-Nassab{1}, Raag Airan{1}, Charles Caskey{2}
{1}Stanford University, United States; {2}Vanderbilt University, United States

12:45 PM
4433: Low-Intensity Pulsed Ultrasound Promote Injured Articular Cartilage Regeneration In Vitro and In Vivo
Yiming Chen, Huiyi Yang, Zhaojie Wang, Rongrong Zhu, Liming Cheng, Qian Cheng
Tongji University, China

1:00 PM
4142: Augmenting Synergistic Therapy for Orthotopic Glioma via Biomimetic Nanosonosensitizer Mediated Sonodynamic Therapy and Ferroptosis
Mingting Zhu, Yan Li, Pengying Wu, Meiling Liang, Yujin Zong, Mingxi Wan
Xi'an Jiaotong University, China

Tuesday, September 14: 11:45 AM - 1:15 PM (Eastern Time)
C4L-02: PFC: Phononic Frequency Combs & PPA: Physical Acoustics
Session Chair(s): Yook-Kong Yong (Rutgers University)

11:45 AM
4602: Phononic Frequency Combs in Microelectromechanical Systems
Ashwin Seshia
University of Cambridge, United Kingdom

12:15 PM
5485: Excitation of Phononic Frequency Combs in Materials
Adarsh Ganesan{2}, Dominik Maximilian Jureschek{1}, Prineha Narang{1}
{1}Harvard University, United States; {2}National Institute of Standards and Technology, United States

12:30 PM
4996: Nonlinear 2-D Modeling of Phononic Comb Generation in Quartz AT-Cut Resonators
Yook-Kong Yong{2}, Randall Kubena{1}, Walter Wall{1}
{1}HRL Laboratories, United States; {2}Rutgers University, United States

12:45 PM
5468: Excitation of Phononic Frequency Combs in Molecules
Adarsh Ganesan{1}, Hongbin Lei{1}, Qian Zhang{1}, Zengxiu Zhao{2}
{1}National Institute of Standards and Technology, United States; {2}National University of Defense Technology, China

1:00 PM
4213: Evaluation of the Optical Characteristics of the Liquid Crystal Lens Using a Shack-Hartmann Wavefront Sensor
Jessica Onaka, Takahiro Iwase, Daisuke Koyama, Mami Matsukawa
Doshisha University, Japan

1:15 PM
4680: Multiplexed Frequency Transmit for Enhanced Harmonic Imaging with Microbubbles
Keren Karlinsky, Tali Ilovitsh
Tel-Aviv University, Israel

Tuesday, September 14: 11:45 AM - 1:15 PM (Eastern Time)
C4L-03: NSP: Signal Processing - Machine Learning & Communications
Session Chair(s): Erdal Oruklu (Illinois Institute of Technology), Joel Harley (University of Florida)

11:45 AM
4910: Enhancing Photoacoustic Visualisation of Clinical Needles with Deep Learning
Mengjie Shi{1}, Zhaoyang Wang{1}, Adrien Emmanuel Desjardins{2}, Tom Vercauteren{1}, Wenfeng Xia{1}
{1}King's College London, United Kingdom; {2}University College London, United Kingdom

12:00 PM
4519: Multi-Task Learning for Simultaneous Speed-of-Sound Mapping and Image Reconstruction Using Non-Contact Thermoacoustics
Ajay Singhvi, Max Wang, Aidan Fitzpatrick, Amin Arbabian
Stanford University, United States

12:15 PM
4614: Deep Auto-Encoder Based Anomaly Detection with Dynamic Threshold for Ultrasonic Guided Wave Structural Health Monitoring
Kang Yang{2}, Sungwon Kim{1}, Joel B. Harley{2}
{1}Universitty of Utah, United States; {2}University of Florida, United States

12:30 PM
5073: A Novel Encryption/Decryption Framework for Ultrasonic Secure Video Transmission
Xin Huang, David Arnold, Tianyang Fang, Jafar Saniie
Illinois Institute of Technology, United States

12:45 PM
4992: Implementation of Real-Time High-Speed Ultrasound Communications Through Tissue
Zhengchang Kou, Michael Oelze
University of Illinois Urbana-Champagin, United States

1:00 PM
4815: Experimental Validation of Crosstalk Minimization in Metallic Barriers with Simultaneous Ultrasonic Power and Data Transfer
Christopher Sugino{1}, Samuel Oxandale{2}, Ahmed Allam{1}, Christian Arrington{2}, Christopher St. John{2}, Ehren Baca{2}, Jeffrey Steinfeldt{2}, Stephen Swift{2}, Charles Reinke{2}, Alper Erturk{1}, Ihab El-Kady{2}
{1}Georgia Institute of Technology, United States; {2}Sandia National Laboratories, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-06: MTC: Applications of Tissue Characterization I (PM)
Session Chair(s): Chris De Korte (Radboud University Medical Center)

1:30 PM
4033: Preclinical Assessment of Breast Cancer and Early Response to Chemotherapy Using 3-D H-Scan Ultrasound Imaging
Haowei Tai, Mawia Khairalseed, Jane Song, Shreya Reddy, Junji Li, Kenneth Hoyt
University of Texas at Dallas, United States

1:40 PM
4047: Frequency-Shifted Narrowband Transmit Pulse Sequencing and Data Compounding Strategy for Improved H-Scan Us Imaging and Tissue Characterization
Mawia Khairalseed, Kenneth Hoyt
University of Texas at Dallas, United States

1:50 PM
4820: Quantitative Characterization of Fatty Liver Using Ultrasound Imaging with Various Beamforming Sound Speeds
Kibo Nam, Mehnoosh Torkzaban, Dina Halegoua-Demarzio, Corinne Wessner, Andrej Lyshchik
Thomas Jefferson University, United States

2:00 PM
5228: Robust Ultrasound Attenuation Coefficient Estimation with Noise Suppression
Ping Gong{1}, Pengfei Song{2}, Chengwu Huang{1}, U Wai Lok{1}, Shanshan Tang{1}, Chenyun Zhou{1}, Lulu Yang{1}, Kymberly Watt{1}, Matthew Callstrom{1}, Shigao Chen{1}
{1}Mayo Clinic, United States; {2}University of Illinois at Urbana-Champaign, United States

2:10 PM
4524: A Quantitative Ultrasound Approach for Detecting Placenta-Mediated Diseases
Farah Deeba{2}, Ricky Hu{2}, Victoria Lessoway{1}, Jefferson Terry{2}, Denise Pugash{2}, Jennifer Hutcheon{2}, Chantal Mayer{2}, Robert Rohling{2}
{1}BC Women's Hospital, Canada; {2}University of British Columbia, Canada

2:20 PM
4667: H-Scan Quantitative Measurement and Imaging to Distinguish Melanoma Metastasis
Jihye Baek, Shuyang Qin, Peter Prieto, Kevin Parker
University of Rochester, United States

2:30 PM
5238: Investigating Pulmonary Fibrosis in Rats Using Ultrasound Multiple Scattering
Roshan Roshankhah{1}, John Blackwell{2}, Hong Yuan{2}, Thomas Egan{2}, Marie Muller{1}
{1}North Carolina State University, United States; {2}University of North Carolina at Chapel Hill, United States

2:40 PM
4725: Mechanical Characterization of Cranial Sutures Using Guided Ultrasonic Waves
Matteo Mazzotti{2}, Eetu Kohtanen{1}, Alper Erturk{1}, Massimo Ruzzene{2}
{1}Georgia Institute of Technology, United States; {2}University of Colorado Boulder, United States

2:50 PM
4928: Ultrasound Measurement of Transmural Myofiber Orientation and Tissue Strain in Stretched Excised Myocardium
John Cormack{2}, Danial Sharifi Kia{2}, Marc Simon{1}, Kang Kim{2}
{1}University of California San Francisco, United States; {2}University of Pittsburgh, United States

3:00 PM
5339: Preterm Infant Bone Health Monitoring Using Pulsed Vibro-Acoustic Technique: A Pilot Study
Juanjuan Gu, Azra Alizad, Mostafa Fatemi
Mayo Clinic, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-07: MIS: Plane Waves & Contrast Agents (PM)
Session Chair(s): Olivier Couture (CNRS at Sorbonne University)

1:30 PM
4225: Faster Acquisition and Improved Image Quality Using Compressed Sensing Based Super-Resolution Ultrasound Imaging
Jihun Kim, Qingfei Wang, Siyuan Zhang, Sangpil Yoon
University of Notre Dame, United States

1:40 PM
4383: Model-Based Deep Learning on Ultrasound Channel Data for Fast Ultrasound Localization Microscopy
Jihwan Youn{2}, Ben Luijten{1}, Mikkel Schou{2}, Matthias Bo Stuart{2}, Yonina C. Eldar{3}, Ruud van Sloun{1}, Jørgen Arendt Jensen{2}
{1}Eindhoven University of Technology, Netherlands; {2}Technical University of Denmark, Denmark; {3}Weizmann Institute of Science, Israel

1:50 PM
4826: In Vivo Chicken Chorioallantoic Membrane (CAM) Vascular Model Development for Deep Learning-Based Ultrasound Localization Microscopy
Xi Chen, Matthew Lowerison, Zhijie Dong, Pengfei Song
Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, United States

2:00 PM
5161: Exploring the Efficacy of Non-Negative Singular Value Decomposition for Nanobubble Contrast Enhanced Ultrasound
Dana Wegierak, Reshani Perera, Michaela Cooley, Mahdi Bayat, Agata Exner
Case Western Reserve University, United States

2:10 PM
5310: Hierarchical Compressed Sensing for High Frame Rate Tissue Harmonic Imaging
Yanjun Xie, Sushanth Govinahallisathyanarayana, John Hossack
University of Virginia, United States

2:20 PM
5461: Correlation-Coefficient as a Spatio-Temporal Filtering Alternative to Singular Value Decomposition for Super-Resolution Transcranial Rat Brain Imaging
Ryan Deruiter{2}, Francisco Santibanez{2}, Sandhya Chandrasekaran{1}, Paul Dayton{2}, Gianmarco Pinton{2}
{1}North Carolina State University, United States; {2}University of North Carolina at Chapel Hill and North Carolina State University, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-08: MBB: Beamforming Methodologies & Devices (PM)
Session Chair(s): Jian-Yu Lu (University of Toledo)

1:30 PM
4072: Evaluation of Delay-Multiply-and-Sum Reconstruction Algorithm for Improving Detection of Bone Surface Defects in a Cadaveric Model
Philip Holmes{2}, Kun-Hui Chen{1}, Hyungkyi Lee{1}, James Fitzsimmons{1}, Shawn O'Driscoll{1}, Matthew W. Urban{1}
{1}Mayo Clinic, United States; {2}Mayo Clinic Graduate School of Biomedical Sciences, United States

1:40 PM
4595: Array-Based Beamforming to the Vertebral Canal: Demonstration of Feasibility
Rui Xu{2}, David Martin{2}, Meaghan O'Reilly{1}
{1}Sunnybrook Research Institute, Canada; {2}University of Toronto, Canada

1:50 PM
4649: Precise Lateral Localization of Scattering Using Multiple Even and Odd Apodizations
Omar Yunis, Carl Herickhoff
University of Memphis, United States

2:00 PM
5232: High Volume Rate 3D Ultrasound Imaging Using Fast-Tilting and Redirecting Reflectors
Zhijie Dong{2}, Shuangliang Li{1}, Matthew Lowerison{2}, Jenna Cario{2}, Jun Zou{1}, Pengfei Song{2}
{1}Texas A&M University, United States; {2}University of Illinois Urbana-Champaign, United States

2:10 PM
5367: Quantifying the Impact of Breast Density on the Lag-One Coherence of Hypoechoic Masses
Alycen Wiacek{2}, Eniola Oluyemi{1}, Kelly Myers{1}, Emily Ambinder{1}, Muyinatu Bell{2}
{1}Johns Hopkins Medicine, United States; {2}Johns Hopkins University, United States

2:20 PM
5380: A Complex-Valued Convolutional Neural Networks Approach for Phase Aberration Correction in Ultrasound Localization Microscopy
Paul Xing, Brice Rauby, Jonathan Porée, Jean Provost
Polytechnique Montreal, Canada

2:30 PM
5387: A Method to Estimate the Spatial Coherence of Photoacoustic Channel Data Without Access to Channel Data
Kelley Kempski, Mardava Gubbi, Muyinatu Bell
Johns Hopkins University, United States

2:40 PM
5390: Null Subtraction Beamforming for Improved Vessel Resolution with Volumetric Contrast-Enhanced Ultrasound Imaging
Megan Yociss, Katherine Brown, Kenneth Hoyt
University of Texas at Dallas, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-09: NPC: Process Control & Industrial Ultrasound & NEH: Energy Harvesting (PM)
Session Chair(s): Bernhard Tittmann (Pennsylvania State University), James Blackshire (Air Force Research Laboratory)

1:30 PM
4017: Identification of Closed Fatigue Fractures in Synthetic Human Tibia Using Vibro-Acoustic Nonlinear Technique: An Experimental Investigation
Anurup Guha{2}, Michael Aynardi{1}, Parisa Shokouhi{2}, Clifford Lissenden{2}
{1}Hershey Medial Center, United States; {2}Pennsylvania State University, United States

1:40 PM
4411: Ultrasonic Process Monitoring of Robotic Arc Welding Using an Air-Coupled Optical Microphone
Georg Kaniak, Ryan Sommerhuber, Khaled Kassem, Martin Ursprung, Markus Svarc, Balthasar Fischer
XARION Laser Acoustics GmbH, Austria

1:50 PM
4522: Reconstruction of Temperature Fields from Ultrasonic Travel Time Measurements
Michael Schwarz, Bernhard Zagar
Institute for Measurement Technology, Johannes Kepler University Linz, Austria

2:00 PM
4645: Ultrasonic Assisted Coring of Rocks
Xuan Li, Patrick Harkness
University of Glasgow, United Kingdom

2:10 PM
4682: Detachable Dry-Coupled Ultrasonic Power Transfer Through Metallic Enclosures
Ahmed Allam{1}, Herit Patel{1}, Christopher Sugino{1}, Christian Arrington{2}, Christopher St. John{2}, Jeffrey Steinfeldt{2}, Alper Erturk{1}, Ihab El-Kady{2}
{1}Georgia Institute of Technology, United States; {2}Sandia National Laboratories, United States

2:20 PM
4728: Lead-Free Composite Piezo-Ultrasound Induced Energy Harvesting for Biomedcial Applications
Laiming Jiang, Gengxi Lu, Yushun Zeng, Yizhe Sun, Runze Li, Qifa Zhou
University of Southern California, United States

2:30 PM
4746: Numerical Modeling of Acoustophoresis for Paper Pulp Concentration
Nicolas Quaegebeur{1}, Romain Le Magueresse{1}, Maxime Bilodeau{1}, Tamara Krpic{1}, Robert Schiavi{2}, Pierre Gélinas{3}
{1}GAUS, Université de Sherbrooke, Canada; {2}Valmet, Hudson Falls (NY), United States; {3}Valmet, Trois-Rivières (QC), Canada

2:40 PM
4774: Measurement of Ultrasonic Radiation from Light Emitting Diode Lighting Devices
Mari Ueda{1}, Koki Harusawa{1}, Yuumi Inamura{1}, Hideyuki Hasegawa{3}, Kentaro Nakamura{2}
{1}Kanagawa Institute of Technology, Japan; {2}Tokyo Institute of Technology, Japan; {3}University of Toyama, Japan

2:50 PM
4811: Acoustic Power Transmission Through Air/Skin Interface Using a 400kHz Focused Airborne Transducer Array
Yosra Dammak{1}, François Vander Meulen{1}, Dominique Certon{1}, Laurent Colin{1}, Thien Hoang{2}, Guillaume Ferin{2}, Bogdan Rosinski{2}, Samuel Callé{1}
{1}Greman, Université de Tours, France; {2}Vermon SA, France

3:00 PM
5001: A Microwatt Ultrasound Backscattering Telemetry Protocol for Targeting Deep Implants
Shinnosuke Kawasaki, Indulakshmi Subramaniam, Marta Saccher, Ronald Dekker
Delft University of Technology, Netherlands

3:10 PM
5337: In-Situ Quality Monitoring of High-Power Ultrasonic Additive Manufacturing (UAM) Using Scanning Doppler Vibrometry
Gowtham Venkatraman, Leon Headings, Marcelo Dapino
Ohio State University, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-10: MIM: Novel Imaging Methods III (PM)
Session Chair(s): Gregg Trahey (Duke University)

1:30 PM
4053: Early Detection of Liver Steatosis Using Multiparametric Ultrasound Imaging
Lokesh Basavarajappa{2}, Junjie Li{3}, Haowei Tai{3}, Jane Song{3}, Kevin Parker{1}, Kenneth Hoyt{3}
{1}University of Rochester, United States; {2}University of Texas at Da, United States; {3}University of Texas at Dallas, United States

1:40 PM
4088: Assessment of Cancer Perfusion with Contrast-Enhanced Ultrasound Imaging and Relationship to Intratumoral Pressure Measures
Dominique James{2}, Jane Song{2}, Junjie Li{2}, Flemming Forsberg{1}, Kibo Nam{1}, Kenneth Hoyt{2}
{1}Thomas Jefferson University, United States; {2}University of Texas at Dallas, United States

1:50 PM
4227: High Contrast Ultrasound Imaging of Very Low Frequency (100 Khz) Modulated Microbubbles
Bowen Jing, Hohyun Lee, Pradosh Dash, Costas Arvanitis, Brooks Lindsey
Georgia Institute of Technology, United States

2:00 PM
4511: Elastic Reverse Time Migration for Imaging Long Bones
Ligia Elena Jaimes-Osorio{3}, Alison Malcolm{3}, Gregory Ely{2}, Guillaume Renaud{1}
{1}Delft University of Technology, Netherlands; {2}Massachusetts Institute of Technology, United States; {3}Memorial University, Canada

2:10 PM
4620: Disease-Specific Imaging with H-Scan Trajectories and Support Vector Machine to Visualize the Progression of Liver Diseases
Jihye Baek, Kevin Parker
University of Rochester, United States

2:20 PM
4742: Correlation-Based Phase Imaging for Real-Time Medical Imaging
Maxime Bilodeau, Nicolas Quaegebeur, Patrice Masson
GAUS, Université de Sherbrooke, Canada

2:30 PM
4813: Visualization of Microcalcifications (MCs) in Breast Cancer by Ultrasound
Charles Scott, Guy Scott
UltraVision Corporation, United States

2:40 PM
5002: Mechanisms Affecting ALARA MI Selected in Adaptive Ultrasound Imaging
Matthew Huber{1}, Katelyn Flint{1}, Emily Barre{1}, David Bradway{1}, Patricia McNally{2}, Sarah Ellestad{3}, Gregg Trahey{1}
{1}Duke University, United States; {2}Duke University Hospital, United States; {3}Duke University Medical Center, United States

2:50 PM
5163: Simultaneous Measurement of Ultrasound-Induced Thermal and Mechanical Effects in Experimental Phantoms Using Harmonic Motion Imaging and Thermal Strain Imaging
Hermes Kamimura, Niloufar Saharkhiz, Stephen Lee, Elisa Konofagou
Columbia University, United States

3:00 PM
5299: An Ultra-Fast Method for Simulation of Realistic Ultrasound Images
Mostafa Sharifzadeh, Habib Benali, Hassan Rivaz
Concordia University, Canada

3:10 PM
5492: Extended Aperture Imaging with Multiple Arrays and Coherent Wavefronts for Expanded Field-of-View and Enhanced Resolution
Josquin Foiret, Hanna Bendjador, Xiran Cai, Katherine Ferrara
Stanford University, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-11: MBF: Blood Flow in Microvessels & MCA: Therapeutic Application (PM)
Session Chair(s): Jørgen Jensen (Technical University Denmark)

1:30 PM
5377: Nonlinear Ultrasound Localization Microscopy (ULM) of the Microcirculation
Jonah Harmon, Zin Khaing, Lindsay Cates, Christoph Hofstetter, Matthew Bruce
University of Washington, United States

1:40 PM
5480: Adaptive Background Noise Bias Suppression in Challenging Motion Corrupted Ultrasound Microvascular Images
Rohit Nayak, Mostafa Fatemi, Azra Alizad
Mayo Clinic College of Medicine and Science, United States

1:50 PM
5491: Hyperspectral Characterization of Microcirculatory Blood Flow of Contused Spinal Cord Tissue from Nonlinear Doppler Imaging of Microbubbles
Matthew Bruce{2}, Jonah Harmon{2}, Zin Khaing{2}, Charles Tremblay-Darveau{1}, Christoph Hofstetter{2}
{1}Philips Medical Systems, United States; {2}University of Washington, United States

2:00 PM
4207: Quantitative Neonate Brain Perfusion Assessment by Ultrafast Power Doppler in the Operative Room. A Clinical Study
Julien Aguet, Nikan Fakhari, Minh Nguyen, Luc Mertens, David Barron, Jérôme Baranger, Olivier Villemain
Hospital for Sick Children, Canada

2:10 PM
4087: Impact of Activation Threshold Selection and Data Averaging to Improve Pressure Estimation Using Ultrasound Imaging and Phase-Change Contrast Agents
Dominique James, Darrah Merillat, Shashank Sirsi, Kenneth Hoyt
University of Texas at Dallas, United States

2:20 PM
4267: Subharmonic Aided Pressure Estimation for Diagnosing Portal Hypertension in Patients on Dialysis for Chronic Kidney Disease
Priscilla Machado{2}, Ipshita Gupta{2}, Jonathan Fenkel{2}, Corinne Wessner{2}, Susan Schultz{3}, Michael Soulen{3}, Kirk Wallace{1}, John Eisenbrey{2}, Flemming Forsberg{2}
{1}GE Global Research, United States; {2}Thomas Jefferson University, United States; {3}University of Pennsylvania, United States

2:30 PM
5012: High-Intensity Focused Ultrasound and Microbubble Induced Hyperthermia in Ex Vivo Porcine Liver
Eric Juang{2}, Aswin Gnanaskandan{3}, Chao-Tsung Hsiao{1}, Lance De Koninck{2}, Michalakis Averkiou{2}
{1}Dynaflow Inc., United States; {2}University of Washington, United States; {3}Worcester Polytechnic Institute, United States

2:40 PM
5457: High Yield, Stable Drug Drug-Loaded Microbubbles with Controllable Narrow Size Dispersions, Shell Composition and Distinct Acoustic Properties
Aj Sojahrood{3}, Cj Yang{2}, P Nittayacharn{2}, C Counil{1}, Ms Khan{2}, Aa Exner{1}, Mc Kolios{2}
{1}Case Western University, United States; {2}Ryerson University, China; {2}Ryerson University, United States; {2}Ryerson University, Canada; {3}Sunnybrook Health Science Center, Canada

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Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-12: TPM: Piezoelectrics I (PM)
Session Chair(s): Jeremy Brown (Dalhousie University)

1:30 PM
4128: Experimental Investigation of the Effect of Subdicing on an Ultrasound Matrix Transducer
Djalma Simoes Dos Santos{1}, Fabian Fool{1}, Taehoon Kim{1}, Emile Noothout{1}, Hendrik J. Vos{1}, Johan G. Bosch{3}, Michiel A. P. Pertijs{1}, Martin D. Verweij{1}, Nico de Jong{2}
{1}Delft University of Technology, Netherlands; {2}Delft University of Technology and Erasmus MC, Netherlands; {3}Erasmus University Medical Center, Netherlands

1:40 PM
4506: Ultrasonic Response at Burns Temperature in Single Crystals: Relaxor PMN and PMN-0.31PbTiO3 Near Morphotropic Phase Boundary
Elena Smirnova{2}, Andrei Sotnikov{3}, Michael Shevelko{1}, Hagen Schmidt{3}
{1}Electrotechnical University, Russia; {2}Ioffe Institute, Russia; {3}Leibniz IFW Dresden, Germany

1:50 PM
4593: Characterisation of PZTs Non-Linear Behaviour for High-Power Systems
Nicola Giuseppe Fenu{2}, Jack Stevenson{2}, Jamie Chilles{1}, Sandy Cochran{2}
{1}Ultraleap, United Kingdom; {2}University of Glasgow, United Kingdom

2:00 PM
4706: High-Power Characterization of d31/32-Mode Mn:PIN-PMN-PT Piezoelectric Single Crystals at Different Temperatures
Nicola Giuseppe Fenu, Jack Stevenson, Nathan Giles-Donovan, Sandy Cochran
University of Glasgow, United Kingdom

2:10 PM
4908: Resonant Coupling of Piezoelectric Micromachined Ultrasound Transducers with Polymer Specimens in Different Media
Hamad Raheem{2}, Ashwin Seshia{2}, Bernadette Craster{1}
{1}TWI Ltd., United Kingdom; {2}University of Cambridge, United Kingdom

2:20 PM
5159: High Power Resonance Characterization of High Temperature Piezoelectric Ceramics
Husain Shekhani{2}, Tim Stevenson{1}, Tim Comyn{1}, David Astles{1}
{1}Ionix Advanced Technologies, United Kingdom; {2}Ultrasonic Advisors LLC, United States

2:30 PM
5175: Oil Filled Flexural Ultrasonic Transducers for Resilience in Environments of Elevated Pressure
William Somerset{3}, Andrew Feeney{1}, Lei Kang{2}, Steve Dixon{3}
{1}University of Glasgow, United Kingdom; {2}University of Portsmouth, United Kingdom; {3}University of Warwick, United Kingdom

2:40 PM
5514: Bandwidth Enhancement Strategies for Acoustic Data Transmission by Piezoelectric Transduction
Romain Gerbe{1}, Christopher Sugino{1}, Massimo Ruzzene{3}, Alper Erturk{1}, Jeffrey Steinfeldt{2}, Samuel Oxandale{2}, Charles Reinke{2}, Ihab El-Kady{2}
{1}Georgia Institute of Technology, United States; {2}Sandia National Laboratories, United States; {3}University of Colorado Boulder, United States

2:50 PM
5516: Wideband Acoustic Data Transmission Through Staircase Piezoelectric Transducers
Romain Gerbe{1}, Christopher Sugino{1}, Massimo Ruzzene{3}, Alper Erturk{1}, Jeffrey Steinfeldt{2}, Samuel Oxandale{2}, Charles Reinke{2}, Ihab El-Kady{2}
{1}Georgia Institute of Technology, United States; {2}Sandia National Laboratories, United States; {3}University of Colorado Boulder, United States

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Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-13: MTH: Cavitation (PM)
Session Chair(s): Hong Chen (Washington University in St. Louis)

1:30 PM
4119: Microbubble-Nanodroplet Mixture for Cavitation-Enhanced Pulsed Ultrasound Thrombolysis
Jinwook Kim{3}, Kathlyne Jayne Bautista{3}, Xiaoning Jiang{1}, Zhen Xu{2}, Paul Dayton{4}
{1}North Carolina State University, United States; {2}University of Michigan, United States; {3}University of North Carolina at Chapel Hill, United States; {4}University of North Carolina at Chapel Hill and North Carolina State University, United States

1:40 PM
4465: Histotripsy Bubble Dynamics in a Collagenous Gel Phantom
Jacob Elliott, Andrea Arguelles, Julianna Simon
Pennsylvania State University, United States

1:50 PM
4941: Cavitation Phenomena in Soft Tissue Generated by an Ultrasonic Hypodermic Needle
Emanuele Perra{1}, Nick Hayward{1}, Edward Hæggström{3}, Kenneth Pritzker{2}, Heikki Nieminen{1}
{1}Aalto University, Finland; {2}Mount Sinai Hospital Toronto, Canada; {3}University of Helsinki, Finland

2:00 PM
4960: Development of Quercetin-Loaded, Ultrasound-Stimulated Perfluorocarbon Nanodroplets for Treatment of Alzheimer's Disease
Siulam Ting, Harriet Lea-Banks, Kullervo Hynynen
Sunnybrook Research Institute, Canada

2:10 PM
5030: Acoustic Emission Based Closed-Loop Focused Ultrasound System for Targeted and Controlled BBB-Opening in Rodents
Hohyun Lee, Yutong Guo, Scott Schoen Jr., Chulyong Kim, Levent Degertekin, Costas Arvanitis
Georgia Institute of Technology, United States

2:20 PM
5449: In-Vivo High-Speed Microscopy of Therapeutically Relevant Microbubble-Vessel Interactions in the Chorioallantoic Membrane Model
Rojin Anbarafshan{2}, Carly Pellow{1}, Alex Wright{1}, Sara Mar{2}, Hon Leong{2}, David Goertz{2}
{1}Sunnybrook Research Institute, Canada; {2}University of Toronto/Sunnybrook Research Institute, Canada

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Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-14: TMS: Transducer Modeling I (PM)
Session Chair(s): Anne-Christine Hladky (CNRS)

1:30 PM
4132: Method to Extract Frequency Dependent Material Attenuation for Improved Transducer Models
Martin Angerer{2}, Michael Zapf{2}, Julia Koppenhöfer{2}, Nicole Ruiter{1}
{1}Karlsruhe Institute of Technology, Germany; {2}KIT, Germany

1:40 PM
4177: Ultrasonics Array Design Using a Rapid Simulation Framework
Xiaoyu Sun, Anthony Croxford, Bruce Drinkwater
University of Bristol, United Kingdom

1:50 PM
4743: High Sound Pressure Level Ultrasound Generation Using a Cam-Follower Mechanism
Nicolas Quaegebeur, Maxime Bilodeau, Philippe Danakas
GAUS, Université de Sherbrooke, Canada

2:00 PM
5297: Acoustic Characterization of Inhomogeneous Layers Using Finite Element Method
Per Kristian Bolstad, Tung Manh, Martijn Frijlink, Lars Hoff
University of South-Eastern Norway, Norway

2:10 PM
5454: Modeling of the Wave Propagation of a Multi-Element Ultrasound Transducer Using Neural Networks
Shaikhah Alkhadhr, Mohamed Almekkawy
Pennsylvania State University, United States

2:20 PM
5462: PINN Simulation of the Temperature Rise Due to Ultrasound Wave Propagation
Yuzhang Wang, Shaikhah Alkhadhr, Mohamed Almekkawy
Pennsylvania State University, United States

Tuesday, September 14: 1:30 PM - 3:30 PM (Eastern Time)
C5P-15: MEL: Applications in Elastography (PM)
Session Chair(s): Steve McAleavey (University of Rochester)

1:30 PM
4515: Evaluating Variability of Commercial Liver Fibrosis Elastography Phantoms
Yuqi Wang{2}, Shigeto Ono{1}, Matthew P. Johnson{2}, Nicholas B. Larson{2}, Matthew W. Urban{2}, Ted Lynch{1}
{1}CIRS, Inc., United States; {2}Mayo Clinic, United States

1:40 PM
4696: Shear Wave Motion Simulations of Renal Cortex Based on Histological Morphology
Luiz Vasconcelos{3}, Piotr Kijanka{1}, Joseph Grande{2}, Matthew W. Urban{2}
{1}AGH University of Science and Technology, Poland; {2}Mayo Clinic, United States; {3}University of Minnesota - Rochester, United States

1:50 PM
4970: Lagrangian Deformation Tracking for Microwave Ablation Zones
Robert Pohlman, James Hinshaw, Timothy Ziemlewicz, Meghan Lubner, Shane Wells, Fred Lee Jr., Marci Alexander, Kelly Wergin, Tomy Varghese
University of Wisconsin School of Medicine and Public Health, United States

2:00 PM
5044: High Frequency Array-Based Ultrasonic Elastography to Assess Biomechanical Properties of the Anterior Eye
Junhang Zhang, Xuejun Qian, Runze Li, Amir Nankali, K. Kirk Shung, Qifa Zhou
University of Southern California, United States

2:10 PM
5244: Imaging of Single Transducer – Harmonic Motion Imaging (ST-HMI)-Derived Displacements at Several Frequencies Simultaneously: Experimental Demonstration in a Breast Cancer Mouse Model and Breast Cancer
Md Murad Hossain, Niloufar Saharkhiz, Elisa Konofagou
Columbia University, United States

2:20 PM
5336: Shear Wave Elasticity Imaging to Differentiate Between Responders and Non-Responders to Radiotherapy in Mice with Colorectal Cancer
Reem Mislati{2}, Taylor Uccello{2}, Rifat Ahmed{1}, Scott Gerber{2}, Marvin Doyley{2}
{1}Duke University, United States; {2}University of Rochester, United States

2:30 PM
5369: ARFI Variance of Acceleration for Diagnostic Breast Cancer Imaging in Women, In Vivo
Anna Phillips, Gabriela Torres, Doreen Steed, Melissa Caughey, Jasmin Merhout, Shanah Kirk, Terry Hartman, Cherie Kuzmiak, Emily Ray, Caterina Gallippi
University of North Carolina at Chapel Hill, United States

2:40 PM
5391: Shear Shocks Are Super-Resolved in a Human Head Phantom and Imaged with High-Frame-Rate Ultrasound
Sandhya Chandrasekaran{2}, Bharat Tripathi{1}, Gianmarco Pinton{3}
{1}National University of Ireland Galway, United States; {2}North Carolina State University, United States; {3}University of North Carolina at Chapel Hill, United States

2:50 PM
5500: Analysis of Ultrasound Bladder Vibrometry Measurements for Non-Invasive Assessment of Detrusor Overactivity
David Rosen, Azra Alizad, Mostafa Fatemi
Mayo Clinic College of Medicine and Science, United States

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-06: MTC: Fundamental Research in Tissue Characterization (AM)
Session Chair(s): Matthew Bruce (University of Washington)

5:45 AM
4187: Intensity Vector Field: A Tool for Visualization and Characterization of Tissue Reflections in High Framerate Ultrasound Imaging
Gayathri Malamal, Mahesh Raveendranatha Panicker
Indian Institute of Technology Palakkad, India

5:55 AM
4205: Effect of Material Properties on Ultrasonic Envelope Statistical Property During Temperature Change
Masaaki Omura{2}, Michio Takeuchi{1}, Ryo Nagaoka{2}, Hideyuki Hasegawa{2}
{1}Tateyama Kagaku, Japan; {2}University of Toyama, Japan

6:05 AM
4308: The Mechanical Effect of Ultrasound on Passive Muscle Force Based on the Standard Linear Solid Model
Xuebing Yang, Xueqing Zhang, Pan Li, Ye Tian, Jianzhong Guo
School of Physics and Information Technology, Shaanxi Normal University, China

6:15 AM
4531: Estimation of Speed of Sound in Propagation Medium Considering Size of Target Scatterer
Shohei Mori, Aoi Nakayama, Keiji Onoda, Mototaka Arakawa, Hiroshi Kanai
Tohoku University, Japan

6:25 AM
4958: Simulation Study on Practical Choices for B/A Measurement by the Generalized Finite Amplitude Insert-Substitution Method
Anastasiia Panfilova, Ruud van Sloun, Hessel Wijkstra, Massimo Mischi
Eindhoven University of Technology, Netherlands

6:35 AM
5116: Chemical Fixation Effects on Speed of Sound Values Obtained from a Healthy Rat Using a 250-MHz Acoustic Microscopy
Kazuki Tamura{1}, Kazuyo Ito{3}, Sachiko Yoshida{4}, Jonathan Mamou{2}, Katsutoshi Miura{1}, Seiji Yamamoto{1}
{1}Hamamatsu University school of medicine, Japan; {2}Riverside Research, United States; {3}Singapore Eye Research Institute, Singapore; {4}Toyohashi University of Technology, Japan

6:45 AM
5271: Multi-Band Finite Element Simulation of Ultrasound Attenuation by Soft Tissue
George West{3}, Emma Harris{2}, Peter Huthwaite{1}, Jeff Bamber{2}, Michael Lowe{1}
{1}Imperial College London, United Kingdom; {2}Institue of Cancer Research, United Kingdom; {3}Institute of Cancer Research, United Kingdom

6:55 AM
5431: Simultaneous Estimation of Ultrasonic Attenuation and Backscatter Coefficients Using Robust Estimation Methods
Hector Chahuara{1}, Adrian Basarab{2}, Roberto Lavarello{1}
{1}Pontificia Universidad Católica del Perú, Peru; {2}Université Toulouse III - Paul Sabatier, France

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-07: MTN: Theranostic Molecular Delivery & Detection (AM)
Session Chair(s): Harriet Lea-Banks (University of Toronto)

5:45 AM
4218: Ultrasound-Guided Gene Therapy of Atherosclerosis
Renfa Liu{2}, Shuai Qu{2}, Hanjoong Jo{1}, Zhifei Dai{2}
{1}Georgia Tech, United States; {2}Peking University, China

5:55 AM
4368: Brain Delivery of Molecular Probes to Detect Cell Apoptosis Through Ultrasound-Mediated Blood-Brain Barrier Opening
Jieqiong Wang, Fei Yan
CAS Key Laboratory of Quantitative Engineering Biology, Shenzhen Institute of Synthetic Biology, China

6:05 AM
4690: Optimized Acoustic Activation of PFP Nanodroplets in Super-Resolution Ultrasound Imaging Using a High-Frequency CMUT Probe
Anqi Huang, Haiyang Yu, Mingxi Wan, Yujin Zong
School of Life Science and Technology, Xi'an Jiaotong University, China

6:15 AM
4430: Hyperthermia and Ultrasound-Triggered Drug Delivery from GAP-Liposome-Microbubble Complexes for Enhancing Thermal Ablation on Rabbit Liver VX2 Tumor
Wen Luo, Jiani Yuan, Lei Ding, Haijing Liu, Peidi Zhang, Xiao Yang, Lina Pang
Xijing Hospital, China

6:25 AM
5319: Applying a Combination of Magnetic Nanoparticles with Gold Nanorods as a Contrast Agent in Magneto-Motive Ultrasound Imaging
Saeideh Arsalani{2}, Soudabeh Arsalani{1}, Ernesto Edgar Mazon Valadez{2}, João Henrique Uliana{2}, Eder Jose Guidelli{2}, Theo Zeferino Pavan{2}, Oswaldo Baffa Filho{2}, Antonio Adilton Oliveira Carneiro{2}
{1}Physikalisch-Technische Bundesanstalt, Germany; {2}Universidade de São Paulo, Ribeirão Preto, SP, Brazil, Brazil

6:35 AM
5494: Ultrafast Volumetric Imaging Guided Acoustic Vortex Trapping Microbubbles for Drug Delivery Application
Wei-Chen Lo{2}, Yu-Ling Huang{2}, Ching-Hsiang Fan{1}, Chih-Kuang Yeh{2}
{1}National Cheng Kung University, Taiwan; {2}National Tsing Hua University, Taiwan

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Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-08: MBB: Volumetric Beamforming & Imaging (AM)
Session Chair(s): Giulia Matrone (University of Pavia)

5:45 AM
4062: Increasing the Field-of-View of a Row-Column Array Using a Diverging Lens
Sigrid Husebø Øygard{1}, Mélanie Audoin{1}, Andreas Austeng{3}, Matthias Bo Stuart{1}, Erik Vilain Thomsen{2}, Jørgen Arendt Jensen{1}
{1}Technical University of Denmark, Denmark; {2}Technical University of Denmark - Health Technology, Denmark; {3}University of Oslo, Norway

5:55 AM
4282: Row Column Specific Frame Multiply and Sum Beamforming for Ultrasfast Volumetric Imaging
Joseph Hansen-Shearer, Marcelo Lerendegui, Matthieu Toulemonde, Meng-Xing Tang
Imperial College London, United Kingdom

6:05 AM
4744: Optimization of 3D Virtual Sources Distribution Based on Ultrasound Image Homogeneity Metrics
Maxime Bilodeau{2}, Goulven Le Moign{2}, Olivier Basset{1}, Hervé Liebgott{1}, Patrice Masson{2}, Nicolas Quaegebeur{2}
{1}CREATIS, INSA-Lyon, France; {2}GAUS, Université de Sherbrooke, Canada

6:15 AM
4903: High Resolution Fast 3D Imaging with Deep Learning Based Adaptive Beamforming
Boudewine Ossenkoppele{1}, Ben Luijten{3}, Deep Bera{5}, Nico de Jong{2}, Ruud van Sloun{4}, Martin Verweij{2}
{1}Delft University of Technology, Netherlands; {2}Delft University of Technology and Erasmus MC, Netherlands; {3}Eindhoven University of Technology, Netherlands; {4}Eindhoven University of Technology and Philips Research, Netherlands; {5}Philips Research

6:25 AM
4973: Feasibility of 3D Coherent Multi-Transducer Ultrasound Imaging with Two Sparse Arrays
Laura Peralta{1}, Alessandro Ramalli{3}, Kirsten Christensen-Jeffries{1}, Sevan Harput{2}, Piero Tortoli{3}, Joseph Hajnal{1}
{1}King's College London, United Kingdom; {2}London South Bank University, United Kingdom; {3}University of Florence, Italy

6:35 AM
4983: Compounding for Row-Column-Address Arrays with Fourier-Based Beamforming
Shang-Ching Lin, Pai-Chi Li
National Taiwan University, Taiwan

6:45 AM
4987: Improved Row-Column Addressed Array Beamforming with Reconstruction of Fully Sampled Array Data Using k-Space Filtering
Shi-Hao Li, Shang-Ching Lin, Pai-Chi Li
National Taiwan University, Taiwan

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-09: MIM: Deep learning Based Segmentation (AM)
Session Chair(s): Yoshifumi Saijo (Tohoku University)

5:45 AM
4198: Measurement of Spinous Process Angles on Ultrasound Spine Images Using HR-Net Method
Wenjie Shao, Hongye Zeng, Yuchong Gao, Kang Zhang, Rui Zheng
ShanghaiTech University, China

5:55 AM
4258: Automatic Spinal Curvature Measurement on Ultrasound Spine Images Using Faster R-CNN Method
Zhichao Liu{1}, Liyue Qian{1}, Wenke Jing{1}, Desen Zhou{1}, Xuming He{1}, Edmond Lou{2}, Rui Zheng{1}
{1}ShanghaiTech University, China; {2}University of Alberta, Canada

6:05 AM
4778: Light-Weight Deep-Learning Based Automated Bladder Volume Estimation Technique for a 3D Bladder Ultrasound Scanner: An In-Vivo Human Clinical Study
Hyeju Song{1}, Maria Lee{2}, Aeran Seol{2}, Jaesok Yu{1}
{1}Daegu Gyeongbuk institute of science & technology (DGIST), Korea; {2}Seoul National University Hospital, Korea

6:15 AM
4843: MAEF-Net: Multi-Attention Efficient Feature Fusion Network for Deep Learning Segmentation and Quantitative Analysis of the Left Ventricle in 2D Echocardiography
Yan Zeng{1}, Po-Hsiang Tsui{3}, Weiwei Wu{2}, Zhuhuang Zhou{1}, Shuicai Wu{1}
{1}Beijing University of Technology, Beijing, China; {2}Capital Medical University, China; {3}College of Medicine, Chang Gung University, China

6:25 AM
4857: Structure-Aware Loss Function for Ultrasound Image Segmentation
Yixuan Fu{1}, Junying Chen{1}, Kai Li{2}
{1}South China University of Technology, China; {2}Third Affiliated Hospital of Sun Yat-sen University, China

6:35 AM
4867: Automatic Chamber and Myocardial Segmentation in Contrast-Enhanced Ultrafast Ultrasound Images Using Deep Learning Techniques
Antonia Alalitei{2}, Matthieu Toulemonde{2}, Xiaowei Zhou{1}, Matthew Shun-Shin{2}, Meng-Xing Tang{2}
{1}Chongqing Medical University, China; {2}Imperial College London, United Kingdom

6:45 AM
5023: Medical Ultrasound Image Segmentation Based on Improved MultiResUNet Network
Xinze Li{1}, Wei Shi{2}, Yang Jiao{1}, Chen Yang{2}, Ninghao Wang{2}, Yaoyao Cui{1}
{1}Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China; {2}University of Science and Technology of China, China

6:55 AM

5083: Automated Prostate Volume Measurement in 2D TRUS Using Deep Learning
Inhyeok Hwang{2}, Kunkyu Lee{2}, Moon-Hyung Choi{1}, Tai-Kyong Song{2}
{1}Eunpyeong St. Mary's Hospital, Korea; {2}Sogang University, Korea

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Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-10: MIM: Super-Resolution Imaging III (AM)
Session Chair(s): Meng-Xing Tang (Imperial College London), Georg Schmitz (Ruhr-Universität Bochum)

5:45 AM
4359: 3D Printed Phantom with Channel Separation of 24.2 µm for Super-Resolution Ultrasound
Martin Lind Ommen{1}, Mikkel Schou{1}, Niels Bent Larsen{1}, Jørgen Arendt Jensen{1}, Erik Vilain Thomsen{2}
{1}Technical University of Denmark, Denmark; {2}Technical University of Denmark - Health Technology, Denmark

5:55 AM
4388: Improving Ultrasound Super-Resolution Image Tracking in High Bubble Concentrations
Jipeng Yan{1}, Tao Zhang{2}, Jacob Broughton-Venner{1}, Pintong Huang{2}, Meng-Xing Tang{1}
{1}Imperial College London, United Kingdom; {2}Second Affiliated Hospital of Zhejiang University School of Medicine, China

6:05 AM
4401: Volumetric Image Projection Super-Resolution (VIP-SR) Ultrasound with a 1D Array Probe
Bingxue Wang, Kai Riemer, Matthieu Toulemonde, Jacob Broughton-Venner, Xiaowei Zhou, Meng-Xing Tang
Imperial College London, United Kingdom

6:15 AM
4556: High-Frequency Contrast-Enhanced Ultrasound Imaging and Super-Resolution Imaging of Rat Coronary Arteries
Feng Feng, Jian An, Jiabin Zhang, Feihong Dong, Wenyu Guo, Shuo Huang, Jue Zhang
Peking University, China

6:25 AM
4608: Velocity Filtering with a Median Filter Better Preserves Small Vessels for Ultrasound Localization Microscopy
Stefanie Dencks, Marion Piepenbrock, Georg Schmitz
Ruhr-Universität Bochum, Germany

6:35 AM
4658: Non-Localization Super-Resolution Velocity Evaluation Based on the Trail of Point Spread Functions (TPSF))
Jiabin Zhang, Jingyi Yin, Jian An, Feihong Dong, Di Wang, Feng Feng, Shuo Huang, Wenyu Guo, Jue Zhang
Peking University, China

6:45 AM
4660: 30MHz High-Frequency Contrast-Enhanced Ultrasound and Super-Resolution Imaging Using Long-Lasting Microbubbles
Jiabin Zhang, Jian An, Feihong Dong, Di Wang, Feng Feng, Jingyi Yin, Wenyu Guo, Shuo Huang, Jue Zhang
Peking University, China

6:55 AM
4693: Ultrasound Localization Microscopy of the Human Kidney on a Clinical Ultrasound Scanner
Sylvain Bodard{1}, Vincent Hingot{2}, Oliver Hélénon{1}, Olivier Couture{2}, Jean-Michel Coréas{1}
{1}Adult Radiology of the Necker University Hospital (APHP), France; {2}Sorbonne Université, CNRS, INSERM Laboratoire d'Imagerie Biomédicale, Paris, France, France

7:05 AM
4785: Validation Platform for Super-Resolution Ultrasound Imaging
Mikkel Schou{1}, Martin Lind Ommen{1}, Iman Taghavi{1}, Jihwan Youn{1}, Niels Bent Larsen{1}, Erik Vilain Thomsen{2}, Jørgen Arendt Jensen{1}
{1}Technical University of Denmark, Denmark; {2}Technical University of Denmark - Health Technology, Denmark

7:15 AM
4966: Effects of Aberration on Super-Resolution Ultrasound Imaging Using Microbubbles
Laura Peralta, Kirsten Christensen-Jeffries
Kings College London, United Kingdom

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-11: MBF: Processing & Filtering in Blood Flow Imaging (AM)
Session Chair(s): Francois Vignon (Butterfly)

5:45 AM
4259: Blind Source Separation Framework for Perfusion Imaging During Fast Tissue Motion
Geraldi Wahyulaksana, Luxi Wei, Jasper Schoormans, Antonius van der Steen, Nico de Jong, Hendrik Vos
Erasmus MC, Netherlands

5:55 AM
4354: Ultrafast Doppler Imaging with Diverging Wave and Robust Principle Component Analysis for Coronary Flow Measurement – Phantom Experiments
Yizhou Huang{1}, Xufei Chen{1}, Emilia Badescu{2}, Ruud van Sloun{1}, Massimo Mischi{1}
{1}Eindhoven University of Technology, Netherlands; {2}Philips Research, France

6:05 AM
4510: Ultrafast Doppler with Spatial SVD Filtering for Synovial Vascularity Imaging in Rheumatoid Arthritis
Kuo-Lung Lai, Pai-Chi Li
National Taiwan University, Taiwan

6:15 AM
4701: Robust PCA-Based Ultrafast Ultrasound Blood Flow Clutter Filtering with Randomized Spatial Downsampling
Yihui Sui{1}, Shaoyuan Yan{2}, Kailiang Xu{2}, Xin Liu{1}, Dean Ta{2}, Weiqi Wang{2}
{1}Academy for Engineering and Technology, Fudan University, China; {2}Center for Biomedical Engineering, School of Information Science and Technology, Fudan University, China

6:25 AM
4801: Adaptive Compensation of TGC Effects in Contrast-Free Ultrasensitive Ultrasound Doppler Imaging for Improved Resistivity Index Map Visualization
Lenin Chinchilla{1}, Thomas Frappart{3}, Christophe Fraschini{3}, Jean-Michel Correas{2}, Jean-Luc Gennisson{1}
{1}BioMaps, Université Paris-Saclay, CEA, CNRS, Inserm, France; {2}Hôpital Necker, APHP, France; {3}Supersonic Imagine, France

6:35 AM
4832: Improved Background Noise Suppression in Ultrasound Localization Microscopy Using Spatial Coherence Beamforming
Jingke Zhang, Lijie Huang, Jianwen Luo
Tsinghua University, China

6:45 AM
5035: Adaptive Clutter Filtering for Ultrafast Doppler Imaging of Blood Flow Using Fast Multivariate Empirical Mode Decomposition
Xun Lang{3}, Bingbing He{1}, Yufeng Zhang{1}, Qiming Chen{2}, Lei Xie{2}
{1}Information School, Yunnan University, China; {2}State Key Laboratory of Industrial Control Technology, Zhejiang University, China; {3}Yunnan University, China

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Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-12: TPM: Piezoelectrics II (AM)
Session Chair(s): Jianren Yuan (ALS Ultrasound)

5:45 AM
4156: High Temperature Characteristics of Bi4Ti3O12/Aluminum Oxide Ultrasonic Transducers
Hiroaki Akatsuka, Kei Nakatsuma, Makiko Kobayashi
Kumamoto University, Japan

5:55 AM
4392: Fabrication of 1-3 Piezocomposites via Soft Mold Process for Imaging Improvement of Intravascular Ultrasound
Xiaobing Li, Junting Tian, Weiyan Ding, Jiewen Zhou
University of Shanghai for Science and technology, China

6:05 AM
4585: Comparison of Performance of Ultrasonic Surgical Cutting Devices Incorporating PZT Piezoceramic and Mn:PIN-PMN-PT Piezocrystal
Xuan Li, Nicola Giuseppe Fenu, Sandy Cochran, Margaret Lucas
University of Glasgow, United Kingdom

6:15 AM
4707: A Measure of Energy Density to Quantify Progress in Pb-Free Piezoelectric Material Development
Nathan Giles-Donovan{2}, Nicola Giuseppe Fenu{2}, Chris Stock{1}, Shujun Zhang{3}, Sandy Cochran{2}
{1}University of Edinburgh, United Kingdom; {2}University of Glasgow, United Kingdom; {3}University of Wollongong, Australia

6:25 AM
4716: High Temperature Durability Improvement of PbTiO3/ Pb(Zr,Ti)O3 Ultrasonic Transducers
Kohei Hirakawa, Makie Hidaka, Naoki Kanbayashi, Makiko Kobayashi
Kumamoto University, Japan

6:35 AM
4791: Design and Characterisation of a µUS Linear Array Based on Randomised Piezocomposite
Arjin Boonruang{2}, Alexandru Moldovan{2}, Tim Button{1}, Sandy Cochran{2}
{1}University of Birmingham, United Kingdom; {2}University of Glasgow, United Kingdom

6:45 AM
5127: Miniature Ultrasonic Motor Using (Bi,Na)Ti3-BaTiO3 Multilayered Transducer
Susumu Miyake{2}, Tomoya Aizawa{1}, Tomohiro Harada{1}, Hiroyuki Shimizu{1}, Sumiaki Kishimoto{1}, Takeshi Morita{2}
{1}Taiyo Yuden Co., Ltd., Japan; {2}University of Tokyo, Japan

6:55 AM
5466: Thick Epitaxial ScAlN Film/ (111) Pt/ (0001) Sapphire Ultrasonic Transducer in the 30 MHz
Naoya Iwata, Takahiko Yanagitani
Waseda University, Japan

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-13: MTH: Cavitation & Thermal Ablation (AM)
Session Chair(s): Yaoyao Cui (Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences), ShinIchiro Umemura (Tohoku University)

5:45 AM
4271: Cavitation Dynamics and its Noise Spectra Characteristics In Vivo: Focusing on Bubble-Bubble Interaction
Qingqin Zou, Zhangyong Li, Wei Wang, Dui Qin
School of Bioinformatics, Chongqing University of Posts and Telecommunications, Chongqing, China, China

5:55 AM
4450: Transient Flow Vector Distribution of Cavitation Bubbles in a Vessel Indued by Pulsed Focused Ultrasound Thrombolysis Based on Pyramid LK Optical Flow Method
Ting Ding, Huizhu Jia, Zhixin Tian, Shuai Tian
North University of China, China

6:05 AM
4451: Enhancement of Sonothrombolysis Efficiency Using High Intensity Focused Acoustic Vortex
Shifang Guo, Zhen Ya, Pengying Wu, Mingxi Wan
Xi'an Jiaotong University, China

6:15 AM
4883: Efficacy Estimation of Microbubble-Assisted Local Sonothrombolysis Using a Catheter with a Series of Miniature Transducers
Wenchang Huang{2}, Peiyang Li{1}, Yao Zeng{2}, Jie Xu{1}, Weiwei Shao{1}, Yaoyao Cui{1}
{1}Suzhou Institute of Biomedical Engineering and Technology Chinese Academy of Sciences, China; {2}University of Science and Technology of China, China

6:25 AM
5189: Reducing Brain Infarct After Stroke-Reperfusion by Oxygen-Loaded Microbubbles
Siang-Long Jheng, Yi-Ju Ho, Chih-Kuang Yeh
National Tsing Hua University, Taiwan

6:35 AM
5420: Enhanced Sonodynamic Therapy by Carbon Dots-Shelled Microbubbles
Nan Wu, Chih-Kuang Yeh
National Tsing Hua University, Taiwan

6:45 AM
4024: A Large Scan Range Generated by Sparse Array with Square Element for Ultrasound Surgery
Quan Zhang, Tingting Qi, Ruixin Li, Mingzhu Lu, Jianyun Mao, Yi Zhang, Yehui Liu, Rongzheng Yang, Mingxi Wan
Xi'an Jiaotong University, China

6:55 AM
4268: Nakagami Parameter Imaging Based on Gaussian Pyramid for Focused Ultrasound Surgery
Ting Ding, Zhixin Tian, Huizhu Jia, Shuai Tian
North University of China, China

7:05 AM
4319: Efficient Thermal Ablation of High Intensity Focused Acoustic Vortex
Shifang Guo, Zhen Ya, Pengying Wu, Yan Li, Mingxi Wan
Xi'an Jiaotong University, China

7:15 AM
4530: Novel Visualization Technique to Measure a Wide Range of Temperature Distribution Induced by High-Intensity Focused Ultrasound
Ryo Takagi, Kiyoshi Yoshinaka, Toshikatsu Washio, Yoshihiko Koseki
National Institute of Advanced Industrial Science and Technology (AIST), Japan

7:25 AM
4641: Monitoring Ablation Dimensions and Areas of Catheter-Based Ultrasound Thermal Therapy Using Thresholding Fitted Changes in Ultrasound Backscatter Energy Imaging
Diya Wang{3}, Everette C. Burdette{1}, Chris J. Diederich{2}
{1}Acoustic Medsystems Inc, United States; {2}Department of Radiation Oncology, University of California San Francisco, United States; {3}School of Life Science and Technology, Xi'an Jiaotong University, China

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Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-14: TMS: Transducer Modeling II (AM)
Session Chair(s): Stefan Rupitsch (University of Freiburg)

5:45 AM
4369: Optimization Design of Ultrasonic Transducer with Multi-Matching Layer
Zhaoxi Li, Chunlong Fei, Dongdong Chen, Yintang Yang
Xidian University, China

5:55 AM
4533: A Novel Broadband Piezoelectric Micromachined Ultrasonic Transducer with Resonant Cavity
Lei Wang, Wei Zhu, Zhipeng Wu, Wenjuan Liu, Chengliang Sun
Institute of Technological Sciences, Wuhan University, China

6:05 AM
4704: Simulation of Bulk Piezoelectric Implant with Amplitude Modulation-Based Backscatter Communication for Implant Applications
Muhammad Junaid Akhtar, Alp Timuçin Toymuş, Levent Beker
Koç University, Istanbul, Turkey, Turkey

6:15 AM
4735: Application of Phononic Crystal Structure for Side Leakage Suppression in A1-Mode Lamb Wave Resonators
Keyuan Gong{2}, Zhaohui Wu{2}, Yu-Po Wong{1}, Jiacheng Liu{2}, Qi Liang{2}, Yawei Li{2}, Jing-Fu Bao{2}, Ken-Ya Hashimoto{3}
{1}Chiba University, Japan; {2}University of Electronic Science and Technology of China, China; {3}University of Electronic Science and Technology of China & Chiba University, Japan

6:25 AM
4740: Simulation of Protection Layer for Air-Coupled Waveguided Ultrasonic Phased Arrays
Matthias Rutsch, Fabian Krauß, Gianni Allevato, Jan Hinrichs, Mario Kupnik
Technische Universität Darmstadt, Germany

6:35 AM
4882: Incorporating Planar Folded Front Masses in Bolted Langevin-Style Transducers for Minimally Invasive Surgery
Abdul Hadi Chibli{1}, Xuan Li{1}, Nicola Giuseppe Fenu{1}, Sandy Cochran{1}, Anthony Gachagan{2}
{1}University of Glasgow, United Kingdom; {2}University of Strathclyde, United Kingdom

6:45 AM
5069: Ultrasound Non-Uniform Linear Array Design for Sidelobe Reduction
Yujia Tang, Yang Jiao, Zhangjian Li, Yaoyao Cui
Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China

6:55 AM
5242: Multiferroic Magnetic Sensor Based on AlN and Alsc0.3N Thin Film
Yuxi Wang, Kangfu Liu, Shuai Shao, Karampuri Yadagiri, Tao Wu
ShanghaiTech University, China

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-15: MEL: Advancements in Elastography (AM)
Session Chair(s): Annette Caenen (Ghent University)

5:45 AM
4085: Improved Phase Velocity Estimation in Viscoelastic Media
Piotr Kijanka{1}, Matthew W. Urban{2}
{1}AGH University of Science and Technology, Poland; {2}Mayo Clinic, United States

5:55 AM
4234: Comparison of Longitudinal and Shear Wave Speeds Ultrasonically Measured in Agar-Glycerol Phantoms
Naotaka Nitta{1}, Toshikatsu Washio{1}, Tomokazu Numano{2}
{1}National Institute of Advanced Industrial Science and Technology (AIST), Japan; {2}Tokyo Metropolitan University, Japan

6:05 AM
4323: Hadamard-Encoded Synthetic Transmit Aperture Imaging for Improved Lateral Estimation in Ultrasound Elastography
Yuanyuan Wang, Qiong He, Jianwen Luo
Tsinghua University, China

6:15 AM
4644: Refinement of the Acoustoelasticity Theory in TI Quasi-Incompressible Media for Robust Muscle Nonlinear Elasticity Quantification
Marion Bied, Cathyanne Schott, Jean-Luc Gennisson
BioMaps, Université Paris-Saclay, CEA, CNRS, Inserm, France

6:25 AM
5215: Optimization of Spatial Resolution for High Frequency 3D Vibrational Elastography for Preclinical Imaging: A Phantom Study
John Civale, Vaideesh Parasaram, Jeff Bamber, Emma Harris
Institute of Cancer Research (University of London), United Kingdom

6:35 AM
5245: Enhancing the Axial-Velocity Signal-to-Noise Ratio for Shear Wave Elastography Using a Convolutional Neural Network
Xufei Chen, Nishith Chennakeshava, Ruud van Sloun, Massimo Mischi
Eindhoven University of Technology, Netherlands

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-16: TMU: Micromachined Ultrasonic Transducers I (AM)
Session Chair(s): Christine Demore (University of Toronto)

5:45 AM
4013: Fabrication and Spatial Focusing of a Stretchable Two-Dimensional Ultrasonic Array Based on Row and Column Electrodes
Wei Liu, Chunling Zhu, Dawei Wu
Nanjing University of Aeronautics and Astronautics, China

5:55 AM
4057: Active Acoustic Impedance Matching Using CMUT Structure
Hiroki Tanaka, Shuntaro Machida, Mitsuhiko Nanri
Hitachi., Ltd., Japan

6:05 AM
4360: Micromachined High Frequency PMN-PT 1-3 Composite Transducer via Cold Ablation Process
Jiabing Lv{2}, Zhangjian Li{1}, Yaoyao Cui{1}, Xiaohua Jian{1}
{1}Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China; {2}University of Science and Technology of China, China

6:15 AM
4380: High Resolution, High Frequency Ultrasonic Ranging in Air with pMUTs
Yul Koh{1}, David Sze Wai Choong{1}, Daniel Ssu-Han Chen{1}, Duan Jian Goh{1}, Sagnik Ghosh{1}, Jaibir Sharma{1}, Srinivas Merugu{1}, Fabio Quaglia{4}, Marco Ferrera{4}, Alessandro Stuart Savoia{3}, Eldwin Jiaqiang Ng{2}
{1}Agency for Science, Technology and Research, Singapore; {2}Institute of Microelectronics, A-STAR (Agency for Science, Technology and Research), Singapore; {3}Roma Tre University, Italy; {4}STMicroelectronics, Italy

6:25 AM
4554: Piezoelectric Over Silicon-on-Nothing (pSON) Process
Jaibir Sharma{1}, Srinivas Merugu{1}, Sagnik Ghosh{1}, Duan Jian Goh{1}, Yul Koh{1}, Md Husni Hazwani Khairy{1}, Eldwin Jiaqiang Ng{2}
{1}Institute of Microelectronics, Singapore; {2}Institute of Microelectronics, A-STAR (Agency for Science, Technology and Research), Singapore

6:35 AM
4607: A Spiral Archimedean PMUT Array with Improved Focusing Performance
Jianyuan Wang, Sheng Sun, Yuan Ning, Yi Gong, Menglun Zhang, Wei Pang
Tianjin University, China

6:45 AM
4612: Ultrasonic TDoA Indoor Localization Based on Piezoelectric Micromachined Ultrasonic Transducers
Jianyuan Wang, Sheng Sun, Yuan Ning, Menglun Zhang, Wei Pang
Tianjin University, China

6:55 AM
4729: A Study of an Annular Array CMUT Device for the Making of Forward Looking IVUS
Seungmok Lee, Junji Ikeda
Kyocera Corporation, Japan

7:05 AM
4794: Development of Broadband High-Frequency Piezoelectric Micromachined Ultrasonic Transducer 2D Array
Xu-Bo Wang{1}, You-Cao Ma{1}, Le-Ming He{1}, Yan Wang{1}, Wei-Jiang Xu{2}, Antoine Riaud{1}, Jun-Yan Ren{1}, Jia Zhou{1}
{1}School of Microelectronics, Fudan University, China; {2}Université Polytechnique Hauts-de-France, CNRS, Univ. Lille, YNCREA, Centrale Lille, France

7:15 AM
5113: A Broadband Piezoelectric Micromachined Acoustic Transducer with Variable Mass Loading
Binghui Lin, Bohao Hu, Wenjuan Liu, Chengliang Sun
Wuhan University, China

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-17: NTC: Transducers & NFM: Flow Measurement
Session Chair(s): Kui Yao (A STAR, Singapore), Nishal Ramadas (Hy-Met Limited, UK)

5:45 AM
4066: Design of a Wideband Underwater Cymbal Transducer Array with Equivalent Circuits
Hayeong Shim, Donghyun Kim, Yongrae Roh
Kyungpook National University, Korea

5:55 AM
4090: Airborne μm-Level Vibration Measurement with Thermophone and Phase Tracking Method
Takaaki Asada, Shinichi Sasaki, Yuuma Watabe
Murata Manufacturing Co., Ltd., Japan

6:05 AM
4092: Dynamics and Mechanisms of Single Bubble Cleaning in Low-Frequency Ultrasonic Field
Hao Wu{1}, Yuanyuan Li{1}, Hui Chen{1}, Haixia Yu{2}, Dachao Li{2}
{1}Shandong University of Traditional Chinese Medicine, China; {2}Tianjin University, China

6:15 AM
4181: Embedded Industrial System for Calculation-Intensive Ultrasound Applications
Valentino Meacci, Stefano Ricci
University of Florence, Italy

6:25 AM
4276: Characterising Flocculated Suspensions with an Ultrasonic Velocity Profiler (UVP) in Backscatter Mode
Serish Hussain, Jeffrey Peakall, Martyn Barnes, Timothy Hunter
University of Leeds, United Kingdom

6:35 AM
4351: Air-Coupled Ultrasonic Transducer Based on Newly Developed Low-Impedance Material
Rong Guo{2}, Chunlong Fei{2}, Tianlong Zhao{2}, Dongdong Chen{2}, Juan Zhao{1}, Yintang Yang{2}
{1}Xi'an Aigtek Electronic Technology Co. Ltd, China; {2}Xidian University, China

6:45 AM
4497: Design and Investigation of Funnel for Acoustic Wave
Guanjun Yin, Pan Li, Xuebing Yang, Jianzhong Guo
Shaanxi Normal University, China

6:55 AM
4749: Feasibility of Measuring Flow Velocity Profiles with Array-Based Clamp-On Ultrasonic Flow Meters
Douwe van Willigen{1}, Paul van Neer{3}, Jack Massaad{1}, Nico de Jong{2}, Martin Verweij{1}, Michiel A. P. Pertijs{1}
{1}Delft University of Technology, Netherlands; {2}Delft University of Technology and Erasmus MC, Netherlands; {3}TNO, Netherlands

7:05 AM
4839: Objective Function Selection for Array Optimization Using Principal Component Regression
Ze Xi, Xiangang Wang, Xiaowei Luo
Tsinghua University, China

7:15 AM
4914: Benchmarking on the Accuracy of Multiple Clamp-On Transit-Time Ultrasonic Flowmeters
Adrian Luca, Didier Boldo, Emmanuel Thibert, Eric Nanteau
EDF R&D, France

7:25 AM
5156: Research on Stress Detection for Glass Production Based on Ultrasound
Yuqi Gao, Guangbin Zhang
Shaanxi Normal University, China

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-18: PMI: Modeling & Inversion & POA: Opto-Acoustics (AM)
Session Chair(s): Anthony Mulholland (University of Bristol)

5:45 AM
4189: Estimation of Viscoelasticity and Fluidity of the Brain by Variable Low Frequency Shear Wave Speeds Based on Transcranial Ultrasound
Jianjun Yu, Hao Guo, Liyuan Jiang, Hongmei Zhang, Mingxi Wan
Xi'an Jiaotong University, China

5:55 AM
4272: Stride – An Open-Source Platform for High-Performance Ultrasound Computed Tomography
Carlos Cueto{2}, Lluis Guasch{2}, Fabio Luporini{1}, Oscar Bates{2}, George Strong{2}, Oscar Calderón Agudo{2}, Javier Cudeiro{2}, Gerard Gorman{2}, Meng-Xing Tang{2}
{1}Devito Codes, United Kingdom; {2}Imperial College London, United Kingdom

6:05 AM
4329: Assessment of Bone Strength with Ultrasonic Guided Waves by a Multiple Parameter Inversion Algorithm
Xiaojun Song{2}, Dean Ta{1}
{1}Fudan University, China; {2}Fudan University / Shanghai University of Electric Power, China

6:15 AM
5176: A Synthetisation Method for Sparse Ultrasound Imaging Operators
Marcel Windpassinger, Marc Fournelle, Daniel Schmitt, Steffen Tretbar
Fraunhofer IBMT, Germany

6:25 AM
4180: A Machine Learning Based Quantitative Data Analysis for Screening Skin Diseases Based on Optical Coherence Tomography Angiography (OCTA)
Yubo Ji{2}, Shufan Yang{1}, Kanheng Zhou{2}, Chunhui Li{2}, Zhihong Huang{2}
{1}Edinburgh Napier University, United Kingdom; {2}University of Dundee, United Kingdom

6:35 AM
5024: Acousto-Optic Cavity Coupling in a PhoXonic Crystal with Combined Convex and Concave Holes
Hongping Hu{2}, Jun Jin{2}, Shan Jiang{2}, Lamin Zhan{2}, Xiaohong Wang{2}, Vincent Laude{1}
{1}Franche-Comté Electronique Mécanique Thermique et Optique, France; {2}Huazhong University of Science and Technology, China

6:45 AM
5268: Transient Grating Spectroscopy for Complete Elastic Anisotropy: Beyond the Measurement of Surface Acoustic Waves
Kristýna Zoubková, Pavla Stoklasová, Tomáš Grabec, Petr Sedlák, Hanuš Seiner
Institute of Thermomechanics of the Czech Academy of Sciences, Czech Rep.

6:55 AM
5375: Generating Characteristic Acoustic Impedances with Hydrogel Based Phononic Crystals for Use in Ultrasonic Transducer Matching Layers
Paul Daly, Joseph Jackson, James Windmill
University of Strathclyde, United Kingdom

Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-19: NAI: Acoustic Imaging & Microscopy & NPA: Photoacoustics (AM)
Session Chair(s): William Wright (University College Cork), Edward Haeggstrom (University of Helsinki)

5:45 AM
4021: 3D Confocal Photoacoustic Dermoscopy Using a Multifunctional Sono-Opto Probe
Haigang Ma, Qinghua Huang
School of Artificial Intelligence, Optics and Electronics (iOPEN), Northwestern Polytechnical Univer, China

5:55 AM
4204: Photoacoustic Sensitivity Test of Contrast Agents on a Prototype Evaluation Platform
Shili Qu, Kentaro Nakamura
Tokyo Institute of Technology, Japan

6:05 AM
4373: Time-Frequency Correction of Spatial Acoustic Response in Multi-Illumination Photoacoustic Computed Tomography
Xiangwei Lin, Mian Chen, Haoming Lin, Xin Chen, Siping Chen
Shenzhen University, China

6:15 AM
4426: 3D Photoacoustic Simulation of Human Skin Vascular for Quantitative Image Analysis
Tengbo Lyu, Changchun Yang, Jiadong Zhang, Shanshan Guo, Feng Gao, Fei Gao
Shanghaitech University, China

6:25 AM
4550: Intravascular Photoacoustic Endoscopy with Coaxial Excitation and Detection
Riqiang Lin{1}, Xiaojing Gong{2}, Kwok-Ho Lam{1}
{1}Hong Kong Polytechnic University, China; {2}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

6:35 AM
4643: Opto-Acousto-Optical Depth-Profiling of Materials with an Ultrafast Optical Sagnac Interferometer
Artem Husiev{2}, Nikolay Chigarev{2}, Samuel Raetz{2}, Vincent Tournat{2}, Osamu Matsuda{1}, Vitali Gusev{2}
{1}Applied Physics, Faculty of Engineering, Hokkaido University, Japan; {2}LAUM - UMR CNRS 6613, IA-GS, Le Mans Université, France

6:45 AM
4709: Contact Resonance Atomic Force Microscopy with Thermal Noise Analysis
Chengfu Ma{2}, Walter Arnold{1}
{1}Saarland University, Germany; {2}University of Science and Technology of China, China

6:55 AM
4806: Ultrasound Localization Microscopy of Slow Microbubbles with Nonlinear Plane-Wave Sequences
Abderrahmane Aissani{1}, Arthur Chavignon{1}, Vincent Hingot{1}, Baptiste Heiles{3}, Eliott Teston{2}, Olivier Couture{1}
{1}CNRS, France; {2}ESPCI, France; {3}ESPCI,Maresca Lab, Netherlands

7:05 AM
5121: Deep Learning Reconstruction Algorithm Based on Sparse Photoacoustic Tomography System
Wei-Xiang Li{1}, Ze-Zheng Qin{1}, Guang-Xing Liu{2}, Ming-Jian Sun{1}
{1}Harbin Institute of Technology, Weihai, China; {2}Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, China

7:15 AM
5372: Current Density Mapping of the In Vivo Swine Heart Using Multichannel Acoustoelectric Cardiac Imaging
Chiao Huang, Alexander Alvarez, Chet Preston, Jinbum Kang, Matthew O'Donnell, Russell Witte
University of Arizona, United States

7:25 AM
4424: An Automatic Threshold Selection Algorithm to Distinguish a Tissue Chromophore from the Background in Photoacoustic Imaging
Azin Khodaverdi{2}, Tobias Erlöv{2}, Jenny Hult{1}, Nina Reistad{2}, John Albinsson{1}, Aboma Merdasa{1}, Rafi Sheikh{1}, Malin Malmsjö{1}, Magnus Cinthio{2}
{1}Clinical Sciences Lunds universitet, Sweden; {2}Lund University, Sweden

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Wednesday, September 15: 5:45 AM - 7:45 AM (Eastern Time)
D1P-20: NDE: Non-Destructive Evaluation & NMC: Material Characterization II (AM)
Session Chair(s): Anthony Gachagan (University of Strathclyde, Glasgow), Walter Arnold (Fraunhofer Institute for NDT)

5:45 AM
4064: Modeling of the Stress-Strain Relationship of Rock Bolts from Ultrasound Data
Johan E. Carlson{1}, Anton Jansson{2}
{1}Luleå University of Technology, Sweden; {2}Swerim AB, Sweden

5:55 AM
4226: Novel Ultrasonic Data Processing to Detect Ultralight Cement Behind Casing – A Field Study from Utsira High in the North Sea
Sander Thygesen{2}, Tore Lie Sirevaag{1}, Sven Peter Näsholm{2}
{1}Equanostic AS, Norway; {2}University of Oslo, Norway

6:05 AM
4431: Examining the Charging Behaviors of Lithium Batteries with Ultrasonic Time-of-Flight and Amplitude
Qingdi Ke, Wanpeng Li, Shouzhi Jiang, Shouxu Song
Hefei University of Technology, China

6:15 AM
4618: Evaluation of Optical and Acoustical Properties of Ba1-xSrxTiO3 Material Library by Picosecond Laser Ultrasonics
Sandeep Sathyan{3}, Samuel Raetz{3}, Jérôme Wolfman{2}, Béatrice Negulescu{2}, Guozhen Liu{2}, Jean-Louis Longuet{1}, Théo Thréard{3}, Vitalyi Gusev{3}
{1}CEA, DAM, France; {2}Laboratoire GREMAN, UMR 7347 CNRS, Université de Tours, France; {3}LAUM, UMR 6613, IA-GS, CNRS, Le Mans Université, France

6:25 AM
4734: Nonlinear Ultrasonic Phased Array Imaging Based on Amplitude Modulation
Da Teng, Zhiyong Liu, Lishuai Liu, Yanxun Xiang
East China University of Science and Technology, China

6:35 AM
4836: Enhanced Long-Range Guided Wave Pipe Inspection Method with F-K Analysis of Local Scanning Data
Tianhao Liu, Cuixiang Pei, Chenxi Xie, Zhenmao Chen
Xi'an Jiaotong University, China

6:45 AM
4891: Inspection of Subsurface Defects in the Orthotropic Plate-Like Structures with Using Point-Source Constrained Partial Differential Equation on Lp-Space
Haruka Ishibashi, Kenbu Teramoto
Saga University, Japan

6:55 AM
4932: Real-Time Reverberation Identification Using Coherence Factor in Ultrasound Nondestructive Testing
Chi-Wei Yang, Pai-Chi Li
National Taiwan University, Taiwan

7:05 AM
5099: Viscosity Measurement for Liquid in a Soft Container Using Acoustic Irradiation-Induced Vibration and LDV
Tsuneyoshi Sugimoto, Shigeya Kawai, Yutaka Nakagawa
Toin University of Yokohama, Japan

7:15 AM
5506: Exploration of Underground Buried Objects by Noncontact Acoustic Inspection Using Normalized SSE Analysis
Kazuko Sugimoto, Tsuneyoshi Sugimoto
Toin University of Yokohama, Japan

Wednesday, September 15: 8:00 AM - 10:00 AM (Eastern Time)
D2L-01: NTC: Transducers & Industrial Applications - In Memoriam: Jiromaru Tsujino
Session Chair(s): Kentaro Nakamura (Tokyo Institute of Technology)

8:00 AM
5524: In memory of late Professor Jiromaru Tsujino
Kentaro Nakamura
Tokyo Institute of Technology, Japan

8:30 AM
5517: Lithium Niobate-Based RF Microsystems: Advances and Prospects (Invited)
Songbin Gong
UIUC, United States

9:00 AM
4334: Determination of Corrosion and Remaining Aluminum Alloy Thickness Using High-Performance Ultrasonic Transducer Made from One-Dimensional Piezoelectric Nanotube Array
Shuting Chen, Voon-Kean Wong, Sze Yu Tan, Weng Heng Liew, Kui Yao
Agency for Science, Technology and Research, Singapore

9:15 AM
4710: Computation of the Radiation Pattern of Unidirectional SH Wave Generated by Dual PPM EMATs
Lucas Martinho{1}, Alan Kubrusly{1}, Lei Kang{2}, Steve Dixon{3}
{1}Pontifical Catholic University of Rio de Janeiro, Brazil; {2}University of Portsmouth, United Kingdom; {3}University of Warwick, United Kingdom

9:30 AM
5445: Epitaxial PbTiO3 Ultrasonic Transducer for Fingerprint Imaging in the Giga-Hertz Range Using the Reflectometry of Back Side of Substrate
Yusuke Sato, Takahiko Yanagitani
Waseda University, Japan

9:45 AM
5411: Power Plant Testing of Ultrasonic Measurements of Temperature Distribution and Heat Flux to Heat Exchange Surfaces
Mason John, Kenneth Walton, Mikhail Skliar
University of Utah, United States

Wednesday, September 15: 8:00 AM - 10:00 AM (Eastern Time)
D2L-02: MPA: Photoacoustic Imaging
Session Chair(s): Geoffrey Luke (Dartmouth), Xueding Wang (University of Michigan)

8:00 AM
4671: Breaking Limits in Photoacoustic Imaging: Deeper, Faster, Smaller and More Colorful
Junjie Yao
Duke University, United States

8:30 AM
4541: Image-Guided Cancer Immunotherapy – Combined Ultrasound and Photoacoustic Monitoring of Nanoparticle-Labeled Thermal Switch CAR T Cells
Kelsey Kubelick, Lena Gamboa, Jinhwan Kim, Andrei Karpiouk, Gabriel A. Kwong, Stanislav Emelianov
Georgia Institute of Technology and Emory University School of Medicine, United States

8:45 AM
5202: Blind Spectral Unmixing and Wavelength Selection on Photoacoustic Images for the Assessment of Vulnerable Plaques
Camilo Cano, Min Wu, Marc van Sambeek, Richard Lopata
Eindhoven University of Technology, Netherlands

9:00 AM
5263: Spectroscopic Photoacoustic Imaging for Accessing Cervical Tissue Composition in Human Cervical Biopsies
Yan Yan{2}, Maryam Basij{2}, Alpana Garg{2}, Aneesha Varrey{2}, Ali Alhousseini{2}, Richard Hsu{2}, Sonia S. Hassan{2}, Edgar Hernandez-Andrade{1}, Roberto Romero{2}, Mohammad Mehrmohammadi{2}
{1}University of Texas, United States; {2}Wayne State University, United States

9:15 AM
4654: Molecular Photoacoustic Imaging for In Vivo Detection of Matrix Metalloproteinase-9 Using DNA-Decorated Gold Nanoparticles
Jinhwan Kim, Anthony Yu, Kelsey Kubelick, Stanislav Emelianov
Georgia Institute of Technology, United States

9:30 AM
4137: Label-Free Photoacoustic Imaging of Hemodynamic Response in the Mouse Visual Cortex During Retinal Photostimulation
Kai-Wei Chang{2}, Yunhao Zhu{1}, Xueding Wang{2}, Kwoon Wong{2}, Guan Xu{2}
{1}Nanjing University, China; {2}University of Michigan, United States

9:45 AM
4102: Monitoring Blood Clot Formation & Lysis of Human Plasma Containing Mouse Red Blood Cells Using High Frequency Photoacoustics
Filip Bodera{1}, Mark McVey{2}, Krishnan Sathiyamoorthy{1}, Michael Kolios{1}
{1}Ryerson University, Canada; {2}University of Toronto, Canada

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Wednesday, September 15: 8:00 AM - 10:00 AM (Eastern Time)
D2L-03: MEL: New Elasticity Imaging Methods
Session Chair(s): Stefan Catheline (INSERM, LabTAU)

8:00 AM
5518: Elastographic Imaging of Tumor Microenvironment
Marvin Doyley
University of Rochester, United States

8:30 AM
5168: HIFU Lesion Detection Based on Passive Elastography Using Conventional B-Mode Images: Application to Prostate Cancer
Thomas Payen{2}, Sébastien Crouzet{2}, Nicolas Guillen{1}, Jean-Yves Chapelon{2}, Cyril Lafon{2}, Stefan Catheline{2}
{1}EDAP-TMS, France; {2}LabTAU, INSERM, Centre Léon Bérard, Université Lyon 1, Univ Lyon, France

8:45 AM
4291: Towards 3D Passive Shear Elasticity Imaging Using Row-Columns Arrays
Miguel Bernal{2}, Nicolas Benech{1}, Ron Daigle{2}, Javier Brum{1}
{1}Universidad de la República / Laboratorio de Acústica Ultrasonora, Uruguay; {2}Verasonics Inc., United States

9:00 AM
5237: 3D Shear Wave Elastography Using a 2D Row-Column Addressing (RCA) Array and External Vibration
Zhijie Dong{2}, Chengwu Huang{1}, Shigao Chen{1}, Pengfei Song{2}
{1}Mayo Clinic College of Medicine and Science, United States; {2}University of Illinois Urbana-Champaign, United States

9:15 AM
4895: Endoscopic Shear Wave Elastography with Circular Array
Qingyuan Tan, Teng Ma, Jiamei Liu, Jiqing Huang, Yongchuan Li, Yang Xiao, Qi Zhang, Congzhi Wang, Hairong Zheng
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China, China

9:30 AM
5209: Confocal Air-Coupled Acoustic Radiation Force Probe for the Elastography of Tissues Using Optical Coherence Tomography
Fernando Zvietcovich, Achuth Nair, Yogeshwari Ambekar, Manmohan Singh, Salavat Aglyamov, Michael Twa, Kirill Larin
University of Houston, United States

9:45 AM
5213: Deep Learning Based Quantitative Uncertainty Estimation for Ultrasound Shear Wave Elasticity Imaging
Felix Jin{1}, Lindsey Carlson{3}, Timothy Hall{3}, Helen Feltovich{2}, Mark Palmeri{1}
{1}Duke University, United States; {2}Intermountain Healthcare, United States; {3}University of Wisconsin, United States

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Wednesday, September 15: 8:00 AM - 10:00 AM (Eastern Time)
D2L-04: PAT: Acoustic Tweezers & Particle Manipulation III
Session Chair(s): Likun Zhang (University of Mississippi)

8:00 AM
4783: Water-Air Interface Deformation Induced by a Transient Acoustic Force
Félix Sisombat, Thibaut Devaux, Lionel Haumesser, Samuel Callé
GREMAN, UMR 7347,Université de Tours, CNRS, INSA Centre-Val de Loire, France

8:15 AM
4784: Phenomenon of Flip and Attraction of Tabular Object by Acoustic Radiation Force from Recessed Vibration Surface
Kohei Aono, Manabu Aoyagi
Muroran Institute of Technology, Japan

8:30 AM
5381: Acoustic Radiation Force Acting on a Small Core-Shell Particle Exerted by Standing Waves
Jinping Wang{1}, Feiyan Cai{2}, Xiang-Xiang Xia{1}, Qin Lin{1}, Hai-Rong Zheng{1}
{1}Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China; {2}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

8:45 AM
4153: Acoustic Radiation Force on Small Spheres Due to Transient Acoustic Fields
Antoine Riaud{1}, Qing Wang{1}, Zhixiong Gong{2}, Jia Zhou{1}, Michael Baudoin{2}
{1}Fudan University, China; {2}Lille University, France

9:00 AM
4466: One-Sided Acoustical Tweezers Based on Focused Acoustical Vortices for 3D Trapping and Axial Positioning of Cells and Microparticles
Zhixiong Gong{1}, Michael Baudoin{2}
{1}CNRS UMR8520 IEMN, France; {2}University of Lille, France

9:15 AM
4238: Large-Scale Rotational Object Manipulation of Weak-Focused Acoustic Vortex
Ning Ding{1}, Yuzhi Li{1}, Qingyu Ma{1}, Gepu Guo{1}, Juan Tu{2}, Dong Zhang{2}
{1}Nanjing Normal University, China; {2}Nanjing University, China

9:30 AM
4094: Repeller and Attractor Vortices Generated in Sessile Droplets by Swirling Surface Acoustic Waves
Shuren Song, Jia Zhou, Antoine Riaud
School of Microelectronics, Fudan University, China

9:45 AM
4715: Endoskeletal Droplets Under Standing Acoustic Waves: Effects of Primary and Secondary Radiation Forces
Gazendra Shakya, Tao Yang, Yu Gao, Apresio Fajrial, Mark Borden, Xiaoyun Ding
University of Colorado at Boulder, United States

Wednesday, September 15: 8:00 AM - 10:00 AM (Eastern Time)
D2L-05: ASD: SAW Devices I
Session Chair(s): Ben Abbott (Skyworks Solutions), Ken-ya Hashimoto (University of Electronic Science and Technology of China)

8:00 AM
4002: Quantum Leap in Simulation Technologies for Radio Frequency Surface and Bulk Acoustic Wave Devices Gifted by Hierarchical Cascading Technique
Ken-Ya Hashimoto{3}, Yu-Po Wong{1}, Naoto Matsuoka{2}, Xinyi Li{3}, Yulin Huang{3}, Jingfu Bao{3}
{1}Chiba University, Japan; {2}NDK SAW devices Co. Ltd., Japan; {3}University of Electronic Science and Technology of China, China

8:30 AM
4232: Performance Dependency of HAL SAW Resonator on Polarity of LiTaO3 on Quartz
Michio Kadota, Yoshimi Ishii, Shuji Tanaka
Tohoku university, Japan

8:45 AM
4030: I.H.P. SAW Transverse Edge Design for Energy Confinement with Suppressed Scattering Loss and Transverse Mode
Yu-Po Wong{1}, Yiwen He{3}, Naoto Matsuoka{2}, Qi Liang{3}, Jingfu Bao{3}, Ken-Ya Hashimoto{3}
{1}Chiba University, Japan; {2}NDK SAW devices Co., Ltd., Japan; {3}University of Electronic Science and Technology of China, China

9:00 AM
4099: Finite Element Simulations for Predicting Nonlinear Responses of Layered SAW Systems
Thomas Forster{3}, Vikrant Chauhan{2}, Markus Mayer{2}, Andreas Mayer{1}, Elena Mayer{1}, Thomas Ebner{2}, Karl Wagner{2}, Amelie Hagelauer{3}
{1}Offenburg University of Applied Sciences, Germany; {2}RF360 Europe GmbH, Germany; {3}University of Bayreuth, Germany

9:15 AM
4130: Ultrawide-Band SAW Devices Using SH0 Mode Wave with Increased Velocity for 5G Front-Ends
Hongyan Zhou{2}, Shibin Zhang{2}, Jinbo Wu{2}, Pengcheng Zheng{2}, Liping Zhang{2}, Hongtao Xu{1}, Zhenghua An{1}, Tiangui You{2}, Xin Ou{2}
{1}Fudan University, China; {2}Shanghai Institute of Microsystem and Information Technology, China

9:30 AM
4248: Improved TCF of Low Velocity Ln HAL SAW Resonators Using Glass Substrate
Chua Tzong Lin, Michio Kadota, Shuji Tanaka
Tohoku University, Japan

9:45 AM
4256: Ultra-Wideband Surface Acoustic Wave Filters Based on the Cu/LiNbO3/SiO2/SiC Structure
Junyao Shen{3}, Sulei Fu{3}, Rongxuan Su{3}, Huiping Xu{3}, Zengtian Lu{2}, Qiaozhen Zhang{1}, Fei Zeng{3}, Cheng Song{3}, Weibiao Wang{2}, Feng Pan{3}
{1}Shanghai Normal University, China; {2}SHOULDER Electronics Limited, China; {3}Tsinghua University, China

Wednesday, September 15: 10:30 AM - 12:00 PM (Eastern Time)
D3L-01: MTH: Drug Delivery & BBB Opening
Session Chair(s): Ayache Bouakaz (INSERM)

10:30 AM
4755: Static Magnetic Fields Dampen Focused Ultrasound-Induced Microbubble Cavitation and Attenuate Brain Drug Delivery Efficiency
Yaoheng Yang{1}, Christopher Pacia{2}, Dezhuang Ye{1}, Yimei Yue{1}, Chih-Yen Chien{1}, Hong Chen{1}
{1}Washington University in st louis, United States; {2}Washington University in St. Louis, United States

10:45 AM
4604: Liposomal Delivery to the Brain Using Rapid Short-Pulses of Focused Ultrasound
Sophie Morse{1}, Aishwarya Mishra{2}, Tiffany Chan{1}, Rafael T. M. de Rosales{2}, James Choi{1}
{1}Imperial College London, United Kingdom; {2}King's College London, United Kingdom

11:00 AM
5412: Natural Aging and Alzheimer's Disease Pathology Increase Blood-Brain Barrier Opening Volume and Prolong BBB Closing Timeline Without Affecting Closing Rate
Rebecca Noel, Robin Ji, Alec Batts, Alina Kline-Schoder, Elisa Konofagou
Columbia University, United States

11:15 AM
4613: FUS-Mediated Intranasally Delivery of Immune Checkpoint Inhibitors to Brain Tumors
Dezhuang Ye{1}, Jinyun Yuan{2}, Yimei Yue{2}, Joshua B. Rubin{3}, Hong Chen{2}
{1}Washington University in st louis, United States; {2}Washington University in St. Louis, United States; {3}Washington University School of Medicine, United States

11:30 AM
5182: Long-Term Fear Modulation Following Non-Invasive Blood-Brain Barrier Opening and Optogenetic Stimulation in Mice
Antonios Pouliopoulos, Maria Murillo, Rebecca Noel, Alec Batts, Robin Ji, Elisa Konofagou
Columbia University, United States

11:45 AM
4185: Spatiotemporal Modulation of Stiffness-Dependent Gene Expression Using Acoustically-Responsive Scaffolds
Brock Humphries, Mitra Aliabouzar, Kenneth Ho, Gary Luker, Mario Fabiilli
University of Michigan, United States

Wednesday, September 15: 10:30 AM - 12:00 PM (Eastern Time)
D3L-02: NDE: Non-Destructive Evaluation & NMC: Material Characterization I (AM)
Session Chair(s): Walter Arnold (Fraunhofer Institute for NDT), Bernhard Tittmann (Pennsylvania State University)

10:30 AM
4372: Compressed Ultrasound Computed Tomography in NDT
Eduardo Pérez{3}, Sebastian Semper{4}, Jan Kirchhof{4}, Fabian Krieg{2}, Florian Römer{1}
{1}Fraunhofer IZFP, Germany; {2}Fraunhofer IZFP and htw saar, Germany; {3}Fraunhofer IZFP and TU Ilmenau, Germany; {4}TU Ilmenau, Germany

10:45 AM
4371: Adaptive Beamforming and Multi-Wave Fusion for Precise Non-Destructive Evaluation with Laser Ultrasound
Mengzhi Fan, Yanbin Zou, Lijun Xu, Jianguo Ma
Beihang University, China

11:00 AM
4739: Lamb Waves Excited by an Air-Coupled Ultrasonic Phased Array for Non-Contact, Non-Destructive Detection of Discontinuities in Sheet Materials
Jan Hinrichs{1}, Matthias Sachsenweger{1}, Matthias Rutsch{1}, Gianni Allevato{1}, William M. D. Wright{2}, Mario Kupnik{1}
{1}Technische Universität Darmstadt, Germany; {2}University College Cork (UCC), Ireland

11:15 AM
5112: Thermal Compensation for In-Process Ultrasonic Inspection of Welds
Katherine Tant, Jonathan Singh, Euan Foster, Nina Sweeney, Charles Macleod, David Lines
University of Strathclyde, United Kingdom

11:30 AM
4113: Nondestructive State-of-Charge Assessment of Lithium-Ion Batteries Using Quantitative Ultrasound Spectroscopy
Daniel Rohrbach{2}, Esteban Garcia{1}, Jack Potter{2}, Vladimir Martinez{1}, Miguel Bernal{2}
{1}Universidad Pontificia Bolivariana, Grupo de investigación en Energia y Termodinámica, Colombia; {2}Verasonics Inc., United States

11:45 AM
4591: Evaluation of Epoxy Curing Dynamics Near its Interface with Metals by Time-Domain Brillouin Scattering Three-Dimensional Imaging
Sandeep Sathyan{2}, Samuel Raetz{2}, Erwan Nicol{1}, Mathieu Edely{1}, Nikolay Chigarev{2}, Nicolas Cuvillier{3}, Justine Delozanne{3}, Mathieu Ducousso{3}, Vincent Tournat{2}, Vitali Gusev{2}
{1}IMMM, UMR 6283, CNRS, Le Mans Université, France; {2}LAUM, UMR 6613, IA-GS, CNRS, Le Mans Université, France; {3}SAFRAN TECH, Magny les Hameaux, France, France

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Wednesday, September 15: 10:30 AM - 12:00 PM (Eastern Time)
D3L-03: TTT: Novel Applications
Session Chair(s): Xiaoning Jiang (NC State University), Xiang Li (NC State University)

10:30 AM
4681: Energy Harvesting and Passive Resonators with Contactless Interrogation for Stand-Alone Sensors Based on Piezoelectric Films
Vittorio Ferrari
University of Brescia, Italy

11:00 AM
5133: Novel Front-End Design with High-Voltage Transceiver ASICs for Ultrasound Computed Tomography
Zewei Lu, Roberto Blanco, Klaus Schlote-Holubek, Michael Zapf, Hartmut Gemmeke, Ivan Perić, Nicole Ruiter
Karlsruhe Institute of Technology, Germany

11:15 AM
4772: Design and Simulation of Heating Transducer Arrays for Ultrasound-Induced Thermal Strain Imaging
Mengyue Chen{2}, Zhiyu Sheng{3}, Howuk Kim{2}, Bohua Zhang{2}, Qiyang Chen{3}, Kang Kim{3}, Xuecang Geng{1}, Xiaoning Jiang{2}
{1}Blatek Inc., United States; {2}North Carolina State University, United States; {3}University of Pittsburgh, United States

11:30 AM
5397: Intravascular Dual-Frequency Ultrasound Transducer Using a Stack Composite
Huaiyu Wu{3}, Howuk Kim{3}, Bohua Zhang{3}, Jinwook Kim{2}, Paul Dayton{4}, Zhen Xu{1}, Xiaoning Jiang{3}
{1}Biomedical Engineering, University of Michigan, United States; {2}Joint Department of Biomedical Engineering, University of North Carolina at Chapel Hill, United States; {3}Mechanical and Aerospace Engineering, North Carolina State University, United S

11:45 AM
4499: Laser Beam Guided Magnetic Scanning Catheter for Sonothrombolysis with Real-Time Clot Detection
Bohua Zhang, Huaiyu Wu, Xiaoning Jiang
NC State University, United States

Wednesday, September 15: 10:30 AM - 12:00 PM (Eastern Time)
D3L-04: Special Session: Frontiers of Physical Acoustics
Session Chair(s): Alexei Maznev (MIT)

10:30 AM
4662: Using Acoustics to Demonstrate Topological and Non-Hermitian Physics
Che Ting Chan
Hong Kong University of Science and Technology, Hong Kong

11:00 AM
5309: Time-Variations and Gain for the Next Generation of Metamaterials
Andrea Alù
CUNY Advanced Science Research Center, United States

11:30 AM
4666: Generation of Picosecond Strain Pulses via Ultrafast 1st Order Phase Transition in VO2
Iaroslav Mogunov{1}, Sergiy Lysenko{3}, Anatolii Fedianin{1}, Félix Fernández{3}, Armando Rúa{3}, Anthony Kent{2}, Andrey Akimov{2}, Alexandra Kalashnikova{1}
{1}Ioffe Institute, Russia; {2}University of Nottingham, United Kingdom; {3}University of Puerto Rico, United States

11:45 AM
4653: Diffusion of Coherent GHz Surface Acoustic Waves in Phononic Crystals
Changxiu Li{3}, Nikolay Chigarev{3}, Théo Thréard{3}, Kedong Zhang{1}, Nicolas Delorme{2}, Vincent Tournat{3}, Samuel Raetz{3}, Hong Lu{1}, Vitalyi Gusev{3}
{1}College of Engineering and Applied Sciences, Nanjing University, China; {2}IMMM, UMR 6283 CNRS, Le Mans Université, France; {3}Laboratoire d'Acoustique de l'Université du Mans, UMR 6613, CNRS, Le Mans Université, France

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Wednesday, September 15: 10:30 AM - 12:00 PM (Eastern Time)
D3L-05: MTC: Applications of Tissue Characterization
Session Chair(s): Massimo Mischi (Einhoven University of Technology)

10:30 AM
4523: Ultrasonic Attenuation Coefficient Estimate of Placenta Is Correlated to MRI Proton-Density-Fat Fraction: A Preliminary Ex-Vivo Study
Farah Deeba{2}, Caitlin Schneider{2}, Ricky Hu{2}, Victoria Lessoway{1}, Jefferson Terry{2}, Denise Pugash{2}, Jennifer Hutcheon{2}, Chantal Mayer{2}, Robert Rohling{2}
{1}BC Women's Hospital, Canada; {2}University of British Columbia, Canada

10:45 AM
4129: A Novel Strategy for 3D Imaging of Tissue Fiber Structure
Jean-Baptiste Guillaumin, Jean-François Aubry, Mickael Tanter, Béatrice Berthon
Physics for Medicine Paris, Inserm, CNRS, ESPCI Paris, PSL University, France

11:00 AM
5226: Deep Neural Network for Multiparametric Ultrasound Imaging of Prostate Cancer
Derek Chan{1}, D. Cody Morris{1}, Theresa Lye{3}, Thomas Polascik{2}, Mark Palmeri{1}, Jonathan Mamou{4}, Kathryn Nightingale{1}
{1}Duke University, United States; {2}Duke University Medical Center, United States; {3}F.L. Lizzi Center for Biomedical Engineering, Riverside Research, United States; {4}Riverside Research, United States

11:15 AM
4712: Spatially Variant Attenuation and Backscatter Coefficient Estimation Using a Regularized Linear Least-Squares Approach
Jasleen Birdi, Jan D'Hooge, Alexander Bertrand
KU Leuven, Belgium

11:30 AM
4600: Ultra-High Resolution Quantitative Acoustic Microscopy at 1 GHz
Cameron Hoerig, Jonathan Mamou
Riverside Research, United States

11:45 AM
4311: Radon Transform Based First-Arriving-Signal and Fundamental Flexural Guided Wave Extraction for Cortical Bone Characterization
Feiyao Ling{2}, Kailiang Xu{2}, Qi Chen{2}, Tho N.H.T. Tran{1}, Petro Moilanen{4}, Jean-Gabriel Minonzio{3}, Dean Ta{2}
{1}Academy for Engineering and Technology, Fudan University, China; {2}Center for Biomedical Engineering, School of Information Science and Technology, Fudan University, China; {3}Escuela de Ingeniería Informática, Universidad de Valparaíso, Chile; {4}Uni

Wednesday, September 15: 12:15 PM - 1:15 PM (Eastern Time)
D4L-01: MIM: Functional US & Contrast Imaging
Session Chair(s): Elisa Konofagou (Columbia University)

12:15 PM
5235: High Frequency Functional Ultrasound Imaging of Focused Ultrasound Nerve Stimulation
Stephen Lee, Hermes Kamimura, Elisa Konofagou
Columbia University, United States

12:30 PM
5269: Pre-Clinical Breast Cancer Therapeutic Response Monitoring Using Harmonic Motion Imaging and Functional Ultrasound
Niloufar Saharkhiz{2}, Stephen Lee{2}, Xiaoyue Judy Li{2}, Saurabh Singh{1}, Indranil Basu{1}, Chandan Guha{1}, Elisa Konofagou{2}
{1}Albert Einstein College of Medicine, United States; {2}Columbia University, United States

12:45 PM
5448: Perivascular Spaces Detection in Brain Tissue Swelling by Using Contrast-Enhanced Power Doppler Imaging
Weitao Man{1}, Lijie Huang{2}, Jingke Zhang{2}, Jianfeng Jiao{1}, Linkai Jing{1}, Qiong He{2}, Yi Guo{1}, Jianwen Luo{2}
{1}Beijing Tsinghua Changgung Hospital, China; {2}Tsinghua University, China

1:00 PM
4925: Differentiating Benign from Malignant Focal Liver Lesions on Contrast-Enhanced Ultrasound Using 3D Convolutional Neural Networks
Thodsawit Tiyarattanachai{1}, Simona Turco{2}, Andrej Lyshchik{4}, John Eisenbrey{4}, Daniel Rubin{3}, Aya Kamaya{3}, Ahmed El Kaffas{3}
{1}Chulalongkorn University, Thailand; {2}Eindhoven University of Technology, Netherlands; {3}Stanford University, United States; {4}Thomas Jefferson University, United States

Wednesday, September 15: 12:15 PM - 1:15 PM (Eastern Time)
D4L-02: MIS: Microscopy
Session Chair(s): Gianmarco Pinton (University of North Carolina), Olivier Couture (CNRS at Sorbonne University)

12:15 PM
5243: Development and Validation of AI-Assisted Multi-Spectral Photoacoustic Imaging for the Detection and Quantification of Tissue Chromophores
Valeria Grasso{2}, Joost Holthof{2}, Regine Willumeit-Römer{1}, Jithin Jose{2}
{1}Christian-Albrechts-Universität, Germany; {2}FUJIFILM VisualSonics, Netherlands

12:30 PM
5406: Microbubble Localization in High-Clutter Environments Using Fullwave Simulations and Model-Based Deep Learning
Thomas Kierski{2}, Ben Luijten{1}, Massimo Mischi{1}, Ruud van Sloun{1}, Paul Dayton{3}, Gianmarco Pinton{2}
{1}Eindhoven University of Technology, Netherlands; {2}University of North Carolina - Chapel Hill, United States; {3}University of North Carolina at Chapel Hill and North Carolina State University, United States

12:45 PM
5288: Boosting Matrix Sensitivity for 3D Large Field Transcranial Ultrasound Localization Microscopy Using Multi-Lens Diffracting Layer: A Simulation Study
Hugues Favre, Mathieu Pernot, Mickael Tanter, Clément Papadacci
Physics for Medecine Paris, ESPCI Paris, Inserm U1273, CNRS UMR 8063, France, France

1:00 PM
5498: Regional Quantification of the Left Ventricular Coronary Microvascular Velocity Using Ultrasound Superlocalization Microscopy
Zulma Sandoval, Oscar Demeulenaere, Philippe Mateo, Mickael Tanter, Clément Papadacci, Mathieu Pernot
Physics for medicine ESPCI INSERM Paris, France

Wednesday, September 15: 12:15 PM - 1:15 PM (Eastern Time)
D4L-03: MEL: Cardiovascular Elasticity Imaging
Session Chair(s): Matthew Urban (Mayo Clinic)

12:15 PM
5151: Non-Invasive Real-Time Quantification of Myocardial Anisotropic Elastic Properties in the Human Heart
Olivier Pedreira{1}, Clément Papadacci{1}, Simon Chatelin{1}, Mafalda Correia{1}, Mickael Tanter{1}, Mathieu Pernot{2}
{1}ESPCI Paris, Physics For Medicine, France; {2}ESPCI Paris, Physics For MedicinePhysics For Medicine, France

12:30 PM
4441: Comparison of Myocardial Stiffness Assessed by Natural Shear Wave Elastography and Pressure-Volume Loop Analysis
Stéphanie Bézy{2}, Annette Caenen{3}, Jürgen Duchenne{3}, Marta Orlowska{3}, Matthew Amoni{3}, Lana B.H. Keijzer{1}, Hendrik J Vos{1}, Jens-Uwe Voigt{2}, Jan D'Hooge{3}
{1}Erasmus MC University Medical Center, Netherlands; {2}Katholieke Universiteit Leuven, Belgium; {3}KU Leuven, Belgium

12:45 PM
4792: Interpretation of Transthoracic Acoustic Radiation Force Based Shear Wave Elastography Measurements to Assess Myocardial Stiffness
Annette Caenen{4}, Lana B.H. Keijzer{2}, Stéphanie Bézy{5}, Jürgen Duchenne{6}, Marta Orlowska{6}, Antonius F.W. van der Steen{1}, Nico de Jong{1}, Patrick Segers{4}, Johan G. Bosch{3}, Jens-Uwe Voigt{5}, Jan D'Hooge{6}, Hendrik J. Vos{1}
{1}Erasmus MC, Netherlands; {2}Erasmus MC University Medical Center, Netherlands; {3}Erasmus University Medical Center, Netherlands; {4}Ghent University, Belgium; {5}Katholieke Universiteit Leuven, Belgium; {6}KULeuven, Belgium

1:00 PM
4808: Feasibility of Arterial Wall Stiffness Assessment Along the Entire Circumference Using Beam-Steered Shear Wave Elastography: A Proof-of-Principle Study
Judith Pruijssen, Chris de Korte, Stein Fekkes, Rik Hansen
Radboud university medical center, Netherlands

Wednesday, September 15: 12:15 PM - 1:15 PM (Eastern Time)
D4L-04: AME: Materials & Evaluation II
Session Chair(s): Ausrine Bartasyte (University of Franche-Comté), Mauricio Pereira da Cunha (University of Maine)

12:15 PM
5483: A Method for Evaluating Acoustic Bragg Reflector by Ultrasonic Microscope
Ishii Naoki, Keita Kondo, Takahiko Yanagitani
Waseda University, Japan

12:30 PM
5000: Understanding Substrate Loss in Microwave Acoustic Resonators
Liuqing Gao, Yansong Yang, Songbin Gong
University of Illinois at Urbana-Champaign, United States

12:45 PM
4967: Temperature Stability of Al0.7Sc0.3N Sputtered Thin Films
José Manuel Carmona Cejas, Marta Clement, Teona Mirea, Jimena Olivares, Valeriy Felmetsger
GMME-CEMDATIC-ETSI de Telecomunicación. Universidad Politécnica de Madrid, Spain

1:00 PM
4008: Power Flow Angles of GHz Propagating Acoustic Waves in Thin-Film Lithium Niobate
Ruochen Lu{2}, Songbin Gong{1}
{1}University of Illinois at Urbana-Champaign, United States; {2}University of Texas at Austin, United States

Wednesday, September 15: 12:15 PM - 1:15 PM (Eastern Time)
D4L-05: MIM: Deep learning Based Imaging
Session Chair(s): Jianwen Luo (Tsinghua University)

12:15 PM
5296: A CNN-Based Approach to Complete Despeckling of Ultrasound Images
Dimitris Perdios, Marcel Arditi, Michael Unser, Jean-Philippe Thiran
École polytechnique fédérale de Lausanne (EPFL), Switzerland

12:30 PM
4165: An Efficient Plane Wave Imaging Method for Vocal Cords by Progressively Learning Dual Reconstruction Networks
Junling Gao, Qin Zou, Lei Xu, Bo Zhang, Liang Wu, Diya Wang, Mingxi Wan
Xi'an Jiaotong University, China

12:45 PM
4831: A General Framework for Inverse Problem Solving Using Self-Supervised Deep Learning: Validations in Ultrasound and Photoacoustic Image Reconstruction
Jingke Zhang, Qiong He, Jianwen Luo
Tsinghua University, China

1:00 PM
5082: Deep-Learning-Based Speed-of-Sound Reconstruction for Single-Sided Pulse-Echo Ultrasound Using a Coherency Measure as Input Feature
Marvin Heller, Georg Schmitz
Ruhr University Bochum, Germany

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-06: MTC: Tissue Characterization II (PM)
Session Chair(s): Michael Oelze (University of Illinois)

1:30 PM
4182: In Situ Calibration of the Ultrasonic Backscatter Coefficient in Acoustic Nonlinear Regime
Andres Coila, Michael Oelze
University of Illinois at Urbana-Champaign, United States

1:40 PM
4651: Development of Tough Hydrogels to Mimic Fibrous Prostate Tissue
Yashwanth Nanda Kumar{1}, Zorawar Singh{1}, Yak-Nam Wang{1}, George R. Schade{1}, Wayne Kreider{1}, Matthew Bruce{1}, Eli Vlaisavljevich{2}, Tatiana Khokhlova{1}, Adam D. Maxwell{1}
{1}University of Washington, United States; {2}Virginia Polytechnic Institute and State University, United States

1:50 PM
5218: Simulating and Validating a Technique to Measure Phantom Attenuation Coefficient and Surface Transmission Loss in k-Wave
Karthik Nagabhushana, William D. O'Brien Jr., Aiguo Han
University of Illinois Urbana-Champaign, United States

2:00 PM
5345: Estimation of the Scatterer Size Distributions in Quantitative Ultrasound Using Constrained Optimization
Noushin Jafarpisheh{1}, Ivan M Rosado-Mendez{2}, Timothy Hall{2}, Hassan Rivaz{1}
{1}Concordia University, Canada; {2}Wisconsin-Madison, United States

2:10 PM
5364: Extending CohereNet to Retain Physical Features When Classifying Benign or Malignant Breast Masses
Alycen Wiacek, Najim Dehak, Muyinatu Bell
Johns Hopkins University, United States

2:20 PM
5408: Automated Detection of Liver Steatosis in Ultrasound Images Using Convolutional Neural Networks
Umar Farooq Mohammad, Mohamed Almekkawy
Pennsylvania State University, United States

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-07: MIS: Tissue Characterization, Real-Time Imaging & Imaging Processing (PM)
Session Chair(s): William O'Brien (University of Illinois)

1:30 PM
4563: Broadband Estimation of Ultrasonic Dispersion Energy in Cortical Bones by Regularized Radon Transform with Continuity Enhancement
Tho Tran{1}, Lawrence Le{2}, Mauricio Sacchi{2}, Dean Ta{1}
{1}Fudan University, China; {2}University of Alberta, Canada

1:40 PM
4675: Estimation of Intima-Media Thickness of Carotid Artery by Ultrasound Radiofrequency Signal Decomposition Using Matching Pursuit with Particle Swarm Optimization
Shane Steinberg, Sreeraman Rajan, Yuu Ono
Carleton University, Canada

1:50 PM
4842: Kidney Fibrosis Detection Using Quantitative Ultrasound: Applications in Transplantation
Eno Hysi{3}, Remie Nasr{1}, Cassidy Rose{2}, Xiaolin He{3}, Darren Yuen{3}, Michael Kolios{2}
{1}Lebanese University, Lebanon; {2}Ryerson University, Canada; {3}St. Michael's Hospital, Canada

2:00 PM
5394: Solving the Inverse Problem of Ultrasound Tomography Using Physics Informed Neural Networks
Xilun Liu, Mohamed Almekkawy
Pennsylvania State University, United States

2:10 PM
4606: Radiation Characterization of Leaky Guided Waves in Monolithic and Sutured Cranial Bones
Eetu Kohtanen{1}, Matteo Mazzotti{2}, Massimo Ruzzene{2}, Alper Erturk{1}
{1}Georgia Institute of Technology, United States; {2}University of Colorado Boulder, United States

2:20 PM
4628: How Crystal Composition and Environment Affect the Doppler Ultrasound Twinkling Artifact
Eric Rokni, Julianna Simon
Penn State University, United States

2:30 PM
4829: Automatic 3D Ultrasound Segmentation of Uterus Using Deep Learning
Bahareh Behboodi{1}, Hassan Rivaz{1}, Susan Lalondrelle{2}, Emma Harris{2}
{1}Concordia University, Canada; {2}Institute of Cancer Research, United Kingdom

2:40 PM
4899: Shift-Invariant Segmentation in Breast Ultrasound Images
Mostafa Sharifzadeh, Habib Benali, Hassan Rivaz
Concordia University, Canada

2:50 PM
5472: Effect of SNR on Quantitative Viscoelastic Response (QVisR) Ultrasound in silico
Joseph Richardson, Caterina Gallippi
North Carolina State University, United States

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-08: APM: Plate Wave & MEMS Resonators II (PM)
Session Chair(s): Sunil Bhave (Purdue University), Ventsislav Yantchev (Chalmers University of Technology)

1:30 PM
4199: Sensitivity of XBARs to the Load by External Media
Victor Plessky, Guillermo Villanueva
EPFL, Switzerland

1:40 PM
4500: Direct Observation of Microwave Elastic Displacements in Diamond-Based HBAR
Robert Weser{1}, Andrei Sotnikov{1}, Boris Sorokin{3}, Nikita Asafiev{3}, Denis Sherbakov{2}, Gennady Kvashnin{3}, Hagen Schmidt{1}
{1}Leibniz IFW Dresden, Germany; {2}Moscow Institute of Physics and Technology, Russia; {3}Technological Institute for Superhard and Novel Carbon Materials, Russia

1:50 PM
4566: Algorithm for Automatic Lamb Mode Identification
Silvan Stettler, Rebecca Leghziel, Luis Guillermo Villanueva
EPFL, Switzerland

2:00 PM
4694: Genetic Optimization of the Ladder Filter
Aleksei Shimko{2}, Victor Plessky{1}
{1}EPFL, Switzerland; {2}Wisol, Korea

2:10 PM
4893: Analysis of Performances of AlSc(0.4)N Contour-Mode Resonators
Marco Liffredo, Kaitlin Howell, Luis Guillermo Villanueva
EPFL-NEMS, Switzerland

2:20 PM
4940: A Miniaturized Acoustic Dual-Band Bandpass Filter Using Thin-Film Lithium Niobate
Yansong Yang, Liuqing Gao, Songbin Gong
University of Illinois at Urbana-Champaign, United States

2:30 PM
5259: Comparison of Measurement Techniques for High Frequency Piezoelectric Acoustic Resonators
Soumya Yandrapalli, Seniz Esra Kucuk, Victor Plessky, Luis Guillermo Villanueva
EPFL, Switzerland

2:40 PM
5475: Focusing Profiles of Planar Si-SiO2 Metamaterial GHz Frequency Ultrasonic Lens
Juneho Hwang, Benyamin Davaji, Justin Kuo, Amit Lal
Cornell University, United States

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-09: NSP: Signal Processing Communications & NPA: Photoacoustics (PM)
Session Chair(s): Jafar Saniie (Illinois Institute of Technology), Joel Harley (University of Florida)

1:30 PM
4549: Monitoring Stable Cavitation for Focused-Ultrasound BBB Disruption
Sonia Khan{1}, Michael Smith{1}, Laura Curiel{1}, Ibrahim Youssef{2}, Bhavya Shah{2}, Rajiv Chopra{2}
{1}University of Calgary, Canada; {2}UT Southwestern Medical Center, United States

1:40 PM
4557: Imaging of Picosecond Acoustic Pulses Refraction at Interfaces by Time-Domain Brillouin Scattering
Théo Thréard{2}, Samuel Raetz{2}, David Hurley{1}, Vitalyi Gusev{2}
{1}Idaho National Laboratory, United States; {2}LAUM UMR CNRS 6613, France

1:50 PM
4565: Enabling High-Speed Ultrasound Communication Through Thin Plates by Reverberation Suppression
Asra Ashraf, Johan E. Carlson, Fredrik Reinholdsen, Jaap van de Beek
Luleå University of Technology, Sweden

2:00 PM
4629: An All Optical Photoacoustic Needle Probe for Characterizing the Aggressiveness of Prostate Cancer
Guan Xu, Linyu Ni, Javed Siddiqui, Aaron Udager, Xueding Wang
UNIVERSITY OF MICHIGAN, ANN ARBOR, United States

2:10 PM
4670: Computational Optimization of Mechanical Energy Transduction (COMET) Toolkit
Eetu Kohtanen{1}, Christopher Sugino{1}, Ahmed Allam{1}, Alper Erturk{1}, Ihab El-Kady{2}
{1}Georgia Institute of Technology, United States; {2}Sandia National Laboratories, United States

2:20 PM
4855: Channel Estimation for Ultrasonic Communication Using OFDM on Steel Pipe Channel
Xin Huang, Jafar Saniie
Illinois Institute of Technology, United States

2:30 PM
4943: Unsupervised Learning for 3D Ultrasonic Data Compression
Xin Zhang, Jafar Saniie
Illinois Institute of Technology, United States

2:40 PM
5208: Application of Multidimensional FFT for the Extraction of Wave Vectors and Computer-Aided Visualization of LDV Measurements
Sergey Gartsev, Bernd Köhler
Fraunhofer IKTS, Germany

2:50 PM
5333: Rapid Virtual H&E Histology Using Galvanometer Constant Velocity Scanning with Photoacoustic Remote Sensing
Brendon Restall{2}, Brendyn Cikaluk{2}, Nathaniel Haven{2}, Matthew Martell{2}, Pradyumna Kedarisetti{2}, Sveta Silverman{1}, Lashan Peiris{2}, Jean Deschenes{2}, Roger Zemp{2}
{1}Misericordia Hospital, Canada; {2}University of Alberta, Canada

3:00 PM
5446: Enhanced Adaptive Equalization for High-Rate Ultrasonic Communication Through Solid Channels
Tianyang Fang, Xin Huang, Jafar Saniie
Illinois Institute of Technology, United States

3:10 PM
5474: Short-Wave Infrared Photoacoustic Spectroscopy for Lipid and Water Detection
Christopher Salinas, Eric Reichel, Russell Witte
University of Arizona, United States

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-10: TMI: Imaging Transducers & Electronics (PM)
Session Chair(s): David Cowell (University of Leeds), Enrico Boni (University of Florence)

1:30 PM
4718: Fabrication of Broad Band KNN-Based Lead-Free Piezoelectric High Frequency Ultrasound Transducer for Intravascular and Ocular Imaging Applications
Yushun Zeng, Laiming Jiang, Runze Li, Qifa Zhou
University of Southern California, United States

1:40 PM
4945: A High-Frequency Linear Probe with H-Topology for Pwv Measurements on Superficial Arteries
Maxime Benchemoul{2}, Agnès Lejeune{2}, Nicolas Porcher{2}, Emmanuel Montauban{2}, Guillaume Ferin{2}, Claudine Gehin{1}, Bertrand Massot{1}, Philippe Vince{2}, Martin Flesch{2}
{1}INL Lyon, France; {2}Vermon SA, France

1:50 PM
5021: Boundary Array Transducer with Defocusing Lenses
Jesse Yen{1}, Zoe Nussbaum{2}
{1}University of Southern California, United States; {2}Universtiy of Southern California, United States

2:00 PM
5054: Detection of Screen Protectors Using Under Display Ultrasonic Fingerprint Sensor A-Line Scan for Mobile Devices
Camilo Perez Saaibi{2}, Changting Xu{2}, Soon Joon Yoon{2}, Javier Frydman{1}, Hrishikesh Panchawagh{2}, Kostadin Djordjev{2}
{1}QUALCOMM Israel Ltd., Israel; {2}Qualcomm Technologies, Inc., United States

2:10 PM
5138: Miniaturization of Micro-Ultrasound Transducers for Endoscopic Imaging
Carlos Felipe Roa{2}, Jianhua Yin{1}, Aaron Boyes{1}, Emmanuel Chérin{1}, Nidhi Singh{2}, Stuart Foster{2}, Christine Démoré{2}
{1}Sunnybrook Research Institute, Canada; {2}University of Toronto, Canada

2:20 PM
5231: Passive Stylus Input Using Large Area Biometric Ultrasonic Sensor
Kohei Azumi, Changting Xu, Jae Seo, Hrishikesh Panchawagh, Kostadin Djordjev
Qualcomm Technologies, Inc., United States

2:30 PM
5352: Multi-Axial Transducers for Passive Point Source Localization
Nathan Meulenbroek, Sagid Delgado, Laura Curiel, Samuel Pichardo
University of Calgary, Canada

2:40 PM
5421: Quantitative Study on Error Sensitivity in Ultrasound Probe Calibration with Hybrid Tracking
Qianqian Cai{1}, Tianfu Wu{1}, Jian-Yu Lu{3}, Juan Prieto{2}, Hina Shah{2}, Alan Rosenbaum{2}, Jeffrey Stringer{2}, Xiaoning Jiang{1}
{1}North Carolina State University, United States; {2}University of North Carolina - Chapel Hill, United States; {3}University of Toledo, United States

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Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-11: MIM: 3D Imaging & Tomography (PM)
Session Chair(s): Liangzhong Xiang (University of California Irvine)

1:30 PM
4108: Random Aperture Optimization for SRAC in High Frame Rate Volume Imaging
Miguel Bernal, Daniel Rohrbach, Ron Daigle
Verasonics, Inc, United States

1:40 PM
4841: Timing Optimization with CUDA in Full Wave Inversion Ultrasound Tomography
James Wiskin, Sam Lee, Martin Cwikla, John Klock
QT Imaging, Inc., United States

1:50 PM
5252: Volumetric Ultrafast Orthogonal Row Column Electronic Scanning Power Doppler (uFORCES-PD) & Hadamard-Encoded X-Power Doppler (HEX-PD) with Bias-Switchable Row-Column Arrays
Roger Zemp, Afshin Kashani Ilkhechi, Mohammad Rahim Sobhani, Brendyn Cikaluk, Chris Ceroici
University of Alberta, Canada

2:00 PM
5283: Ultrasound Tomography as a Gauge Equivariant Fully Connected Convolutional Network: Repercussions
James Wiskin
QT Imaging, Inc., United States

2:10 PM
5359: Real-Time 3D Reconstruction of 2D Ultrasound Frames via IMU and GPU Acceleration
Anisha Goel{2}, Sean Huver{2}, Joshua Broder{1}
{1}Duke University School of Medicine, United States; {2}NVIDIA, United States

2:20 PM
5374: Transthoracic Cardiac Strain Imaging with 6DOF Electromagnetic Tracking for 3D Coregistration
Vincent Sayseng, Jad El Harake, Elisa Konofagou
Columbia University, United States

2:30 PM
5382: Imaging of Prostate Cancer with Ultrasound Tomography
James Wiskin{4}, Cheyenne Williams{2}, Ismail Turkbey{3}, A. Toubaji{3}, Michael Daneshvar{3}, Emad Boctor{1}, Yixuan Wu{1}, Sheng Xu{3}, Ayele Negussie{3}, John Klock{5}, Brad Wood{3}, Peter Pinto{3}
{1}Johns Hopkins University, United States; {2}National Institues of Health, United States; {3}National Institutes of Health, United States; {4}QT Imaging, Inc, United States; {5}QT Imaging, Inc., United States

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-12: TPF: Applications of Piezoelectrics (PM)
Session Chair(s): Tomas Gómez Álvarez-Arenas (CSIC)

1:30 PM
4364: Technology for Large Area and Flexible Ultrasound Patches
Laurens Peters{2}, Roy Verbeek{2}, Paul van Neer{1}, Arno Volker{1}, Gerwin Gelinck{2}
{1}TNO Acoustics & Sonar, Netherlands; {2}TNO Holst Centre, Netherlands

1:40 PM
4582: Ultrasonic Surgical Devices Driven with Piezoelectric Tubes
Xuan Li, Nicola Giuseppe Fenu, Sandy Cochran, Margaret Lucas
University of Glasgow, United Kingdom

1:50 PM
4598: Electrical Power Factor for a Single Crystal Tonpilz Versus a Plate with Matching Layers
Ellen Sagaas Roeed{2}, Martin Bring{1}, Frank Tichy{1}, Else-Marie Aasjord{1}, Lars Hoff{3}
{1}Kongsberg Maritime, Norway; {2}Kongsberg Maritime & University of South-Eastern Norway, Norway; {3}University of South-Eastern Norway, Norway

2:00 PM
4640: A Broadband Approach for the Generation and Reception of Low-Frequency Ultrasounds In-Air
Gianluca Barile{2}, Salvatore A. Pullano{1}, Antonino S. Fiorillo{1}, Giuseppe Ferri{2}
{1}University Magna Graecia of Catanzaro, Italy; {2}University of L'Aquila, Italy

2:10 PM
4736: Biodegradable Additive Manufactured Ferroelectret Ultrasonic Transducer with Large Output Pressure
Omar Ben Dali, Sergey Zhukov, Matthias Rutsch, Claas Hartmann, Heinz von Seggern, Gerhard Martin Sessler, Mario Kupnik
Technische Universität Darmstadt, Germany

2:20 PM
4768: In-Display Proximity and Gesture Sensor with Piezoelectric Polymer Technology
Jessica Liu Strohmann{2}, Bernard Herrera-Soukup{1}, Hrishikesh Panchawagh{2}, Nick Buchan{2}, Ricardo Bernal{2}, Yipeng Lu{2}, Kostadin Djordjev{2}
{1}Northeastern University, United States; {2}Qualcomm, United States

2:30 PM
5273: Ferroelectret Hydrophone
Julio Quirce, Tomas Gomez Alvarez-Arenas
CSIC (Spanish National Research Council), Spain

2:40 PM
5276: Calibration of Air-Coupled Ultrasonic Transducers
Julio Quirce{1}, Tomas Gomez Alvarez-Arenas{1}, Linas Svilainis{2}
{1}CSIC (Spanish National Research Council), Spain; {2}KTU, Lithuania

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Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-13: MTH: Thermal Ablation & MTC: Theranotics (PM)
Session Chair(s): Cameron Hoerig (Riverside Research)

1:30 PM
4626: Fast, Large and Non Invasive HIFU Treatment of the Liver Using a Toroidal Transducer. Preclinical Study in an In Vivo Porcine Model
Sophie Cambronero, Aurélien Dupre, Charles Mastier, David Melodelima
LabTAU, INSERM, Centre Léon Bérard, Université Lyon 1, Univ Lyon, F-69003, LYON, France

1:40 PM
5510: Focused Limited-Diffraction Beams for Ultrasound Therapy Applications
Jian-Yu Lu
University of Toledo, United States

1:50 PM
4624: Increase of the Treated Volume Using a Toroidal HIFU Transducer with a Minimal Number of Elements
Sophie Cambronero, David Melodelima
LabTAU, INSERM, Centre Léon Bérard, Université Lyon 1, Univ Lyon, F-69003, LYON, France

2:00 PM
4627: Intra-Operative HIFU Treatment at the Hepato-Caval Confluence of the Liver. Preclinical Study in an In Vivo Porcine Model
Sophie Cambronero, Aurélien Dupre, Charles Mastier, Michel Rivoire, David Melodelima
LabTAU, INSERM, Centre Léon Bérard, Université Lyon 1, Univ Lyon, F-69003, LYON, France

2:10 PM
5287: An Endoscopic Concentric Ring Sector-Vortex Ultrasound Phased Array Applicator for Pancreatic Tumor Ablation
Muhammad Zubair{2}, Matthew S. Adams{2}, Chris J. Diederich{1}
{1}Department of Radiation Oncology, University of California San Francisco, United States; {2}University of California, San Francisco, United States

2:20 PM
4065: Ultrasound Image-Guided Drug Delivery Using a Spherically Focused Phased Array Transducer
Ryan Margolis{2}, Lokesh Basavarajappa{1}, Junjie Li{2}, Kenneth Hoyt{2}
{1}University of Texas at Da, United States; {2}University of Texas at Dallas, United States

2:30 PM
4526: Phase-Changing Nanodroplets for Ultrasound Monitoring of on Demand Delivery of Chemotherapeutics
Catalina-Paula Spatarelu, Austin Van Namen, Geoffrey Luke
Dartmouth College, United States

2:40 PM
4698: Real-Time Closed-Loop Feedback Control of Focused Ultrasound for Consistent Blood-Brain Barrier Opening
Chih-Yen Chien, Yan Gong, Yaoheng Yang, Yimei Yue, Hong Chen
Washington University in St. Louis, United States

2:50 PM
4828: The Dynamics of Histotripsy Bubble Clouds Nucleated from Echogenic Liposomes
Aarushi Bhargava{1}, Samuel Hendley{1}, Shaoling Huang{2}, David McPherson{2}, Kenneth Bader{1}
{1}University of Chicago, United States; {2}University of Texas Health Science Center-Houston, United States

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Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-14: NDE: Non-Destructive Evaluation (PM)
Session Chair(s): Robert Addison (Rockwell Science Center), Lawrance Kessler (Sonoscan Inc.)

1:30 PM
4652: Virtual Array Plane Wave Imaging
Guillermo Cosarinsky{1}, Jorge Cruza{1}, Jose Brizuela{3}, Juan Manuel Iriarte{2}, Jorge Camacho{1}
{1}Institute of Physical and Information Technologies (ITEFI-CSIC), Spain; {2}National Atomic Energy Commission (CNEA), Argentina; {3}National Scientific and Technical Research Council (CONICET), Argentina

1:40 PM
4747: Polymer Structure Defect Characterization Using Airborne Ultrasounds
Nicolas Quaegebeur{2}, Maxime Bilodeau{2}, Hajar Saikouk{2}, Jonathan Delisle{2}, William Grey{1}, Bernard Pelletier{1}
{1}EXO-S, Sherbrooke, Canada; {2}GAUS, Université de Sherbrooke, Canada

1:50 PM
5197: Modelling of Ultrasonic Waves in Layered Elastic Heterogeneous Materials
Alistair Ferguson{3}, Katherine Tant{3}, Mohammud Foondun{3}, Anthony Mulholland{2}, Alistair Forbes{1}
{1}National Physical Laboratory, United Kingdom; {2}University of Bristol, United Kingdom; {3}University of Strathclyde, United Kingdom

2:00 PM
5200: Noise Reduction in Flexible-Array-Inspection Images with Machine Learning for Aerospace Applications
Blair Rocks, Daniel Irving, Kevin McAughey, Han Wells, Claire Thring, David Hughes
Novosound, United Kingdom

2:10 PM
5313: Numerical Simulations of Extensional Ultrasonic Edge Waves for Detecting Impact Damage to the Edges of CFRP Composite Laminates
Jun Yu Harry Chu, Charles Courtney
University of Bath, United Kingdom

2:20 PM
5378: Resonant Ultrasound Applied to Additively Manufactured Alloys
Gabriela Petculescu{2}, Damilola Dada{2}, Naresh Deoli{2}, Jonathan Raush{2}, Shengmin Guo{1}
{1}Louisiana State University, United States; {2}University of Louisiana at Lafayette, United States

2:30 PM
4175: Modelling and Experimental Characterization of Bonding Delamination in Ultrasonic Linear Array Transducer
Wenxiang Ding, Maxime Bavencoffe, Marc Lethiecq
GREMAN UMR7347, Université de Tours, CNRS, INSA Centre Val de Loire, France

2:40 PM
4876: An Efficient Finite Beam Model Description of Stress in a Fluid Immersed Plate Using ASM
Simen Hammervold Midtbø{2}, Magne Aanes{1}, Andreas Talberg{1}, Svein-Erik Måsøy{2}
{1}NDT Global Norway, Norway; {2}Norwegian University of Science and Technology, Norway

2:50 PM
5114: Determination of the Acoustic Properties of a Phenolic Resin Film Using a Radial Electric Field Excited Piezoceramic Resonator
Andrey Teplykh, Boris Zaitsev, Alexander Semyonov, Irina Borodina
Kotel'nikov Institute of Radio Engineering and Electronics of RAS, Saratov Branch, Russia

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-15: MEL: Musculoskeletal Elastography & Anisotropy (PM)
Session Chair(s): Kathy Nightingale (Duke University)

1:30 PM
4283: Nearly Incompressible Transverse Isotropic (NITI) Model of Soft Tissue Elasticity
John J. Pitre Jr., Mitchell Kirby, Maju Kuriakose, Hong-Cin Liou, Ruikang Wang, Matthew O'Donnell, Ivan Pelivanov
University of Washington, United States

1:40 PM
4468: Strong Elastic Anisotropy in the Cornea: Comparing Acoustic Micro-Tapping Based Optical Coherence Elastography with Ex Vivo Mechanical Testing
Mitchell Kirby, Hong-Cin Liou, Tueng Shen, Ivan Pelivanov, Ruikang Wang, Matthew O'Donnell
University of Washington, United States

1:50 PM
4814: Plane Nonlinear Shear Wave Propagation in Transversely Isotropic Soft Tissues
John Cormack
Department of Medicine, University of Pittsburgh, United States

2:00 PM
4951: Factors Affecting In Vivo SH and SV Mode Wave Propagation in Vastus Lateralis Muscle at Varying Knee Flexion Angles Using Ultrasonic Rotational 3D SWEI
Anna Knight{2}, Courtney Trutna{2}, Felix Jin{2}, Ned Rouze{2}, Laura Pietrosimone{2}, Lisa Hobson-Webb{1}, Alison Toth{1}, Mark Palmeri{2}, Kathryn Nightingale{2}
{1}Duke Health, United States; {2}Duke University, United States

2:10 PM
4952: Group Shear Wave Speed Viscoelastic Analysis Using 3D Rotational Volumetric Shear Wave Imaging in Relaxed and Contracted In Vivo Muscle
Courtney Trutna{2}, Anna Knight{2}, Felix Jin{2}, Ned Rouze{2}, Laura Pietrosimone{2}, Alison Toth{1}, Lisa Hobson-Webb{1}, Mark Palmeri{2}, Kathryn Nightingale{2}
{1}Duke Health, United States; {2}Duke University, United States

2:20 PM
5344: In Vivo Ultrasound Shear Wave Elasticity Imaging for Assessing Diaphragm Function in Mice
Jeehyun Lee{2}, Woojin M. Han{3}, Young C. Jang{2}, Sumit Verma{1}, Andrés J. García{2}, Stanislav Emelianov{2}
{1}Emory University School of Medicine, United States; {2}Georgia Institute of Technology, United States; {3}Icahn School of Medicine at Mount Sinai, United States

Wednesday, September 15: 1:30 PM - 3:30 PM (Eastern Time)
D5P-16: TMU: Micromachined Ultrasonic Transducers II (PM)
Session Chair(s): A. Sanli Ergun (Orchard Ultrasoud Innovation)

1:30 PM
4070: Automatic Optical Failure Detection on Large Ultrasonic Arrays
Kasper Fløng Pedersen, Martin Lind Ommen, Erik Vilain Thomsen
Technical University of Denmark, Denmark

1:40 PM
4084: Analytical CMUT Modelling Using Effective Radius Theory
Stine Løvholt Grue, Erik Vilain Thomsen
Technical University of Denmark, Denmark

1:50 PM
4487: Poly-Si on Quartz Substrate for Silicide Based Row-Column CMUTs
Kitty Steenberg, Andreas Spandet Havreland, Erik Vilain Thomsen
Technical University of Denmark, Denmark

2:00 PM
4504: Viscoelasticity Assessment Using Quartz Crystal Microbalance for Accurate Loaded CMUT Modeling
Tony Merrien{1}, Maxime Hery{1}, Audren Boulmé{2}, Dominique Certon{1}
{1}GREMAN, France; {2}MODULEUS, France

2:10 PM
4733: Tailoring High Frequency Ultrasonic Transducers Fabricated by the Soft Mold Process
Paul A. Günther, Holger Neubert, Alexander Michaelis, Sylvia E. Gebhardt
Fraunhofer IKTS, Fraunhofer Institute for Ceramic Technologies and Systems, Germany

2:20 PM
4745: Micro-Structuring with UV Picosecond Laser Pulses as an Enabling Technology for High-Resolution Endoscopic Ultrasound Probes
Daniel Arnaldo Del Cerro{2}, Julian Zou{1}, Katherine Latham{1}, Dimitris Karnakis{2}
{1}Daxsonics Ultrasound Inc., Canada; {2}Oxford Lasers Ltd., United Kingdom

2:30 PM
5300: High Electromechanical Efficiency Charging-Free Hysteresis-Free CMUTs with Long Rectangular Membranes
Eric Dew, Afshin Kashani Ilkhechi, Mohammad Maadi, Roger Zemp
University of Alberta, Canada

2:40 PM
5322: Demonstration of Polyimide-Based Flexible CMUT Operation on Curved Substrates
Ivano Lucarini{2}, Luca Maiolo{1}, Francesco Maita{1}, Alessandro Stuart Savoia{2}
{1}CNR - IMM, Italy; {2}Roma Tre University, Italy

2:50 PM
5351: Optimization of High Frequency CMUT Array Geometry for Guidewire IVUS
Coskun Tekes{2}, Evren Arkan{1}, Levent Degertekin{1}
{1}Georgia Institute of Technology, United States; {2}Kennesaw State University, United States

3:00 PM
5356: Phase Array Ultrasonic Transducer Based on a Flip Chip Bonding with Indium Solder Bump
Jaehoon Lee, Eun-Sok Kim
University of Southern California, United States

3:10 PM
5465: Design of Pre-Charged CMUTs with a Metal Floating Gate
Muhammetgeldi Annayev{1}, Oluwafemi J. Adelegan{2}, Feysel Yalcin Yamaner{1}, Ömer Oralkan{2}
{1}NC State University, United States; {2}North Carolina State University, United States

3:20 PM
5488: Design and Fabrication of Single-Element CMUTs for Forming a Transcranial Array for Focused Beam Applications
Tamzid Ibn Minhaj, Oluwafemi J. Adelegan, Ali Önder Biliroglu, Muhammetgeldi Annayev, Zachary A. Coutant, Feysel Yalcin Yamaner, Ömer Oralkan
North Carolina State University, United States

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-06: MTC: Applications of Tissue Characterization II (AM)
Session Chair(s): Roberto Lavarello (Pontificia Universidad Católica del Perú)

5:45 AM
4261: Quantitative Evaluation of Rotator Cuff Tears Based on Nonlinear Statistical Analysis of Ultrasound Radio-Frequency Signals
Renjie Song{2}, Qi Zhang{2}, Ziyan Yuan{2}, Dahua Xu{1}, Xiasheng Guo{2}, Juan Tu{2}, Dong Zhang{2}
{1}Affiliated Hospital of Nanjing University of Chinese Medicine, China; {2}Institute of Acoustics, School of Physics, Nanjing University, China

5:55 AM
4273: Viscoelastic Properties of a Corneal Stromal Model Measured by Surface Acoustic Wave Optical Coherence Elastography (SAW-OCE)
Yilong Zhang, Kanheng Zhou, Chunhui Li, Zhihong Huang
University of Dundee, United Kingdom

6:05 AM
4673: Quantitative Micro-Ultrasound Differentiates High Grade Glioma and Healthy White Matter in Ex Vivo Tissue Samples
Hannah Thomson{3}, Shufan Yang{1}, Thomas Stritch{2}, Mitch Baldwin{2}, Sandy Cochran{3}
{1}Edinburgh Napier University, United Kingdom; {2}Stryker Medical Devices, United States; {2}Stryker Medical Devices, Ireland; {3}University of Glasgow, United Kingdom

6:15 AM
5075: Simulation of LIPUS Topography and the Thermal Properties of the Achilles Tendon
Qian Zheng{1}, Shuxin Sun{1}, Lixin Jiang{2}, Dean Ta{1}
{1}Fudan University, China; {2}Shanghai Jiao Tong University, China

6:25 AM
5255: Probabilistic Estimation of Speed-of-Sound Anisotropy in Musculoskeletal Ultrasound
Naiara Korta Martiartu{2}, Saulė Simutė{1}, Lisa Ruby{2}, Thomas Frauenfelder{2}, Marga Rominger{2}
{1}ETH Zurich, Switzerland; {2}University Hospital Zurich, Switzerland

6:35 AM
5428: Automatic In Vivo Detection of Posterior Staphyloma Deformation in High Myopia in B-Mode Images
Kazuyo Ito{3}, Jonathan Mamou{2}, Jason Daryle G. Yu{3}, Yee Shan Dan{3}, Theresa Lye{2}, Isabella Q. Loh{3}, Ronald H. Silverman{1}, Quan V. Hoang{3}
{1}Columbia University Irving Medical Center, United States; {2}F.L. Lizzi Center for Biomedical Engineering, Riverside Research, United States; {3}Singapore Eye Research Institute, Singapore National Eye Centre, Duke-NUS Medical School, Singapore

6:45 AM
4539: Entropy Based on Adaptively Decomposed Ultrasound RF Echo Signals for Breast Lesion Characterization
Ruihan Yao{1}, Yufeng Zhang{1}, Zhiyao Li{2}, Xun Lang{3}, Zhicheng Wang{1}, Kai Huang{3}
{1}Information School, Yunnan University, China; {2}Third Affiliated Hospital of Kunming Medical University, China; {3}Yunnan University, China

6:55 AM
4702: Amplitude Envelope Analysis for Characterization of Fibrous Tissue and Fat Droplets in Liver
Yuki Ujihara{3}, Kazuki Tamura{4}, Shohei Mori{5}, Dar-In Tai{1}, Po-Hsiang Tsui{2}, Hiroyuki Hachiya{6}, Shinnosuke Hirata{3}, Kenji Yoshida{3}, Tadashi Yamaguchi{3}
{1}Chang Gung Memorial Hospital, Taiwan; {2}Chang Gung University, Taiwan; {3}Chiba University, Japan; {4}Hamamatsu University School of Medicine, Japan; {5}Tohoku University, Japan; {6}Tokyo Institute of Technology, Japan

7:05 AM
4805: Speed of Sound and Tissue Brightness Evaluation in a Murine Model of Liver Steatosis
Rached Baida{3}, Vincent Hingot{3}, Arthur Chavignon{3}, Gilles Renault{4}, Frank Lager{4}, Catherine Postic{7}, Christian Boitard{2}, Bernard Van Beers{9}, Philippe Garteiser{5}, Dominique Valla{1}, Angélique Brzustowski{1}, Sabrina Doblas{6}, Edwige-Lud
{1}APHP, France; {2}CNRS, INSERM, APHP, Université de Paris, Institut Cochin, France; {3}Inserm, CNRS, Sorbonne Universite, Laboratoire d'Imagerie Biomedicale, Paris, France, France; {4}Inserm, CNRS, université de Paris, institut Cochin, Paris France, Fra

7:15 AM
4837: Ultrasonic Evaluation of Liver Fibrosis Coexisting with Hepatic Steatosis Using the Homodyned K Distribution Combined with Noise-Modulated Empirical Mode Decomposition
Qiyu Zhang{1}, Shuicai Wu{1}, Dar-In Tai{2}, Zhuhuang Zhou{1}, Po-Hsiang Tsui{3}
{1}Biomedical Engineering, Faculty of Environment and Life, Beijing University of Technology, Taiwan; {1}Biomedical Engineering, Faculty of Environment and Life, Beijing University of Technology, China; {2}Gastroenterology and Hepatology, Chang Gung Memor

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-07: MIS: Tissue Characterization & Real Time Imaging (AM)
Session Chair(s): Emilie Franceschini (CNRS at Aix-Marseille University)

5:45 AM
4015: Direct Model-Based Inversion for Improved Freehand Optical Ultrasound Imaging
Erwin Jozef Alles, Eleanor Catriona Mackle, Sacha Noimark, Adrien Emmanuel Desjardins
University College London, United Kingdom

5:55 AM
4194: Motion Compensation Method for Non-Periodic In-Plane and Out-of-Plane Motion in 2D Contrast-Enhanced Ultrasound of Focal Liver Lesions
Thodsawit Tiyarattanachai{1}, Simona Turco{2}, Andrej Lyshchik{4}, John Eisenbrey{4}, Daniel Rubin{3}, Aya Kamaya{3}, Ahmed El Kaffas{3}
{1}Chulalongkorn University, Thailand; {2}Eindhoven University of Technology, Netherlands; {3}Stanford University, United States; {4}Thomas Jefferson University, United States

6:05 AM
4110: Classification of Ultrasound Breast Tumor Images Within BI-RADS Category 4 with False-Positive Using Several CNNs
Pengfei Xu{2}, Jing Zhao{1}, Mingxi Wan{2}, Diya Wang{2}
{1}Second Hospital of Jilin University, China; {2}Xi'an Jiaotong University, China

6:15 AM
4192: Carotid Plaque Vulnerability Assessed by Combined Shear Wave Elastography and Ultrafast Doppler Compared to Histology
Guillaume Goudot{1}, Jonas Sitruk{2}, Anatole Jimenez{3}, Pierre Julia{2}, Lina Khider{2}, Mickael Tanter{3}, Tristan Mirault{2}, Mathieu Pernot{3}, Emmanuel Messas{2}
{1}Assistance Publique Hôpitaux de Paris / University of Paris, France; {2}Georges Pompidou hospital, APHP, University of Paris, France; {3}Physics for Medicine Paris, INSERM U1273, ESPCI, PSL University, France

6:25 AM
4262: Tissue Recognition with Deep Ensemble Learning of Ultrasound Wavelet Spectra
Zhun Xie{1}, Nan Ji{2}, Lijun Xu{1}, Jianguo Ma{1}
{1}Beihang University, China; {2}Beijing Tiantan Hospital, Capital Medical University, China

6:35 AM
4484: Evaluation of Muscle Fatigue State by Ultrasonic Attenuation Coefficient
Yuxi Wang, Guanjun Yin, Jianzhong Guo
Shaanxi Normal University, China

6:45 AM
4642: Fully Automated Left Atrium Quantification Using Deep Learning
Jieyu Hu{1}, Sindre Hellum Olaisen{1}, Erik Smistad{2}, Håvard Dalen{1}, Lasse Løvstakken{1}
{1}Norwegian University of Science and Technology, Norway; {2}Norwegian University of Science and Technology, SINTEF Medical Technology, Norway

6:55 AM
4890: Shape Parameter Mapping Using Gamma Distribution of Puborectalis Muscle from 3D Ultrasound
Catalin Cernat{5}, Shreya Das{1}, Gijs Hendriks{1}, Frieda van Den Noort{5}, Claudia Manzini{4}, C. Huub van der Vaart{3}, Chris de Korte{2}
{1}Radboudumc, Netherlands; {2}Radboudumc, University of Twente, Netherlands; {3}University Medical Center, Utrecht, Netherlands; {4}University Medical Center, Utrechtt, Netherlands; {5}University of Twente, Netherlands

7:05 AM
4939: Harmonic Concise Atoms for Mean Scatterer Spacing Estimation in the Normal and Ablated Liver Tissues
Xiuhua Zeng{1}, Yufeng Zhang{2}, Keyan Wu{2}, Ruihan Yao{2}, Zhicheng Wang{2}
{1}Qujing Normal University, China; {2}Yunnan University, China

7:15 AM
5347: Real-Time Attenuation Estimation on an Experimental Ultrasound System
Sjoerd Nooijens{3}, Holger Hewener{1}, Marcus Ingram{2}, Jasleen Birdi{3}, Arun Muraleedharan{3}, Steffen Tretbar{1}, Alexander Bertrand{3}, Marc Fournelle{1}, Jan D'Hooge{3}
{1}Fraunhofer IBMT, Germany; {2}IMEC, Belgium; {3}KU Leuven, India; {3}KU Leuven, Belgium

7:25 AM
4714: Real-Time Ultrasonic Tracking of an Intraoperative Needle Tip with Integrated Fibre-Optic Hydrophone
Christian Baker{1}, Miguel Xochicale{1}, Francois Joubert{1}, Fang-Yu Lin{1}, Sunish Mathews{3}, Dzhoshkun Shakir{1}, Sebastien Ourselin{1}, Anna David{3}, Brian Dromey{2}, Adrien Emmanuel Desjardins{3}, Tom Vercauteren{1}, Wenfeng Xia{1}
{1}King's College London, United Kingdom; {2}University College Hospital, United Kingdom; {3}University College London, United Kingdom

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Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-09: MIM: Deep learning Based Diagnosis (AM)
Session Chair(s): Libertario Demi (University of Trento)

5:45 AM
4041: A Multicenter Study Assessing Artificial Intelligence Capability in Scoring Lung Ultrasound Videos of COVID-19 Patients
Federico Mento{4}, Tiziano Perrone{3}, Anita Fiengo{3}, Veronica Narvena Macioce{1}, Francesco Tursi{1}, Andrea Smargiassi{2}, Riccardo Inchingolo{2}, Libertario Demi{4}
{1}Asst Lodi, Italy; {2}IRCCS A. Gemelli, Italy; {3}IRCCS San Matteo, Italy; {4}University of Trento, Italy

5:55 AM
4060: Performance Comparison of U-Net and its Variants for Monitoring of Microwave Ablation in Ultrasound
Xin Jia, Mengke Wang, Xiejing Li, Ting Shen, Xingjian Zhao, Mingxi Wan, Siyuan Zhang
Xi'an Jiaotong University, China

6:05 AM
4236: YOLOv4 Neural Network Based Carotid Plaque Recognition from Ultrasound Dynamic Videos
Yao Wei{1}, Jun Xue{1}, Ling Wei{2}, Bin Yang{2}, Meng Yang{1}
{1}Peking Union Medical College Hospital, China; {2}Tsinghua University, China

6:15 AM
4339: Weakly-Supervised Deep Learning for Breast Tumor Detection in Ultrasound Images
Yongshuai Li{1}, Yuan Liu{3}, Zhili Wang{2}, Jianwen Luo{1}
{1}Biomedical Engineering, School of Medicine, Tsinghua University, China; {2}Chinese PLA General Hospital, China; {3}Fifth Medical Center of Chinese PLA General Hospital, China

6:25 AM
4577: Deep-Learning Framework Based on a Large Ultrasound Image Database to Realize Computer-Aided Diagnosis for Liver and Breast Tumors
Makoto Yamakawa{2}, Tsuyoshi Shiina{2}, Koichiro Tsugawa{3}, Naoshi Nishida{1}, Masatoshi Kudo{1}
{1}Kindai University, Japan; {2}Kyoto University, Japan; {3}St. Marianna University School of Medicine, Japan

6:35 AM
5094: Detection and Monitoring of Microwave Ablation Using Convolutional Neural Network with Transfer Learning in Ultrasound
Mengke Wang, Xin Jia, Xiejing Li, Ting Shen, Mingxi Wan, Siyuan Zhang
Xi'an Jiaotong University, China

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-10: MIM: 3D & 4D Imaging (AM)
Session Chair(s): Richard Lopata (Eindhoven University), Hairong Zheng (Shenzhen Institutes of Advanced Technology)

5:45 AM
4167: Robot-Assisted 3-D Transcranial Power Doppler (TCPD) Intelligent Scanning and Imaging System
Liyuan Jiang, Bo Zhang, Shukuan Lu, Jiacheng Liu, Mingxi Wan
Xi'an Jiaotong University, China

5:55 AM
4345: Shared-Sparse Aperture for Matrix Array Super-Resolution 3D Imaging
Di Wang, Jingyi Yin, Jiabin Zhang, Jue Zhang
Peking University, China

6:05 AM
4445: 3D+t Ultrasound-Based Fluid-Structure Interaction Modeling Including Pre-Stress for Abdominal Aortic Aneurysm Rupture Risk Analysis
Judith Fonken{2}, Esther Maas{2}, Arjet Nievergeld{2}, Marc van Sambeek{2}, Frans van de Vosse{1}, Richard Lopata{1}
{1}Eindhoven University of Technology, Netherlands; {2}Eindhoven University of Technology,Catharina Hospital, Netherlands

6:15 AM
4558: 3D Ultrasound Spine Imaging with Application of Neural Radiance Field Method
Honggen Li{2}, Hongbo Chen{2}, Wenke Jing{2}, Yuwei Li{2}, Rui Zheng{1}
{1}ShangahiTech University, China; {2}ShanghaiTech University, China

6:25 AM
4659: 3D Contrast-Enhanced Ultrasound Imaging of the Muscle Using a Sparsely Controlled Matrix Array Probe
Jiabin Zhang, Di Wang, Jian An, Feihong Dong, Feng Feng, Jingyi Yin, Wenyu Guo, Shuo Huang, Jue Zhang
Peking University, China

6:35 AM
4663: Matrix array 3D contrast-enhanced imaging of rabbit kidney in vivo using random sparse apertures
Di Wang, Jiabin Zhang, Jue Zhang
Peking University, China

6:45 AM
4862: 3D Microbubble Localization with a Convolutional Neural Network for Super-Resolution US Imaging
Marion Piepenbrock, Daria Koretskaia, Georg Schmitz, Stefanie Dencks
Ruhr University Bochum, Chair of Medical Engineering, Germany

6:55 AM
5221: Block-Wise 3D Ultrasound Image Super-Resolution
Kenule Tuador Nwigbo{3}, Duong Hung Pham{3}, François Varray{1}, Adrian Basarab{3}, Denis Kouamé{2}
{1}Creatis Laboratory, France; {2}Institut de Recherche en Informatique de Toulouse, UMR CNRS 5505, Université de Toulouse, France; {3}IRIT Laboratory, France

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-11: MIM: Artificial Intelligence Based Image Methods (AM)
Session Chair(s): Hazrat Ali (Umeå University), Jianwen Luo (Tsinghua University)

5:45 AM
4036: Annotation Web – An Open-Source Web-Based Annotation Tool for Ultrasound Images
Erik Smistad{2}, Andreas Østvik{2}, Lasse Løvstakken{1}
{1}Norwegian University of Science and Technology, Norway; {2}Norwegian University of Science and Technology & SINTEF Medical Technology, Norway

5:55 AM
4105: 2.5 D Dual-Phase Intratumoral Microvascular DCEUS-Based Functional Perfusion Imaging Using Machine Learning
Qiao Wang, Shukuan Lu, Mingxi Wan, Diya Wang
Xi'an Jiaotong University, China

6:05 AM
4121: Deep Learning Ultrasound Computed Tomography with Sparse Transmissions
Zhaohui Liu, Jiameng Wang, Mingyue Ding, Ming Yuchi
Huazhong University of Science and Technology, China

6:15 AM
4171: Automatic 3D Ultrasound Imaging for Interphalangeal Joints by 3D Residual Convolutional Neural Network
Qin Zou, Junling Gao, Bo Zhang, Lei Xu, Diya Wang, Mingxi Wan
Xi'an Jiaotong University, China

6:25 AM
4677: Deep Learning Based Diverging Wave Imaging: Temporal Coherence for Cardiac Motion Estimation
Jingfeng Lu{2}, Fabien Millioz{1}, Damien Garcia{1}, Dong Ye{2}, Denis Friboulet{1}
{1}CREATIS, China; {1}CREATIS, France; {2}HIT, France; {2}HIT, China

6:35 AM
4686: Learning Based Approach for Speed-of-Sound Adaptive Rx Beamforming
Young-Min Kim, Myeong-Gee Kim, Seok-Hwan Oh, Gu-Il Jung, Hyeon-Min Bae
KAIST, Korea

6:45 AM
5278: Pixel-Wise Deep Reinforcement Learning Approach for Ultrasound Image Denoising
Piotr Jarosik, Marcin Lewandowski, Ziemowit Klimonda, Michal Byra
Institute of Fundamental Technological Research of the Polish Academy of Sciences, Poland

6:55 AM
5305: Ai Augmented Ultrasound Support for Advanced Femoral Nerve Anesthesia Using a Portable Device
Johan Berggreen{2}, Anders Johansson{4}, John Jahr{3}, Sebastian Möller{1}, Tomas Jansson{1}
{1}Digitalisering IT/MT, Region Skane, Sweden; {2}IPV Skåne University Hospital, Lund Sweden, Sweden; {3}Lund University, Sweden; {4}Office of Medical Service. Lund University Hospital, Lund, Sweden, Sweden

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-12: MIS: Coded Excitation & Tomography (AM)
Session Chair(s): James Wiskin (QT Ultrasound Inc.), Mohamed Almekkawy (Pennsylvania State University)

5:45 AM
4625: Self-Portrait of an Ultrasonic Wave Propagating in a Random Scattering Medium
Elsa Giraudat, William Lambert, Mathias Fink, Alexandre Aubry
Institut Langevin, France

5:55 AM
4892: Impact of CMUTs Nonlinearity on Phase Modulated Coded Excitation
Marie Frisenfeldt Olesen{1}, Fredrik Gran{1}, Jørgen Arendt Jensen{2}, Erik Vilain Thomsen{3}
{1}BK Medical, Denmark; {2}Technical University of Denmark, Denmark; {3}Technical University of Denmark - Health Technology, Denmark

6:05 AM
5186: Reflection Ultrasound Computed Tomography with Sparse Acquisition Sequences
Berkan Lafci, Justine Robin, Xosé Luís Deán-Ben, Daniel Razansky
ETH Zurich and University of Zurich, Switzerland

6:15 AM
5230: Synchronized Sine-Sweep Imaging for Uncoupling Nonlinear Signatures During Pulse Compression
Nathalie Lamothe, Enrique González-Mateo, Noé Jiménez, Francisco Camarena
Universitat Politècnica de València, Spain

6:25 AM
5327: Context-Based Coding of Ultrasound Medical Images Using Shape-Adaptive Transform Representations
Shira Nemirovsky-Rotman, Zvi Friedman, Moshe Porat
Technion, Israel

6:35 AM
5355: Localization of a Scatterer in 3D with a Single-Element Transducer
Luzhen Nie{2}, Steven Freear{2}, Sevan Harput{1}
{1}London South Bank University, United Kingdom; {2}University of Leeds, United Kingdom

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Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-13: NAS: Acoustic Sensors (AM)
Session Chair(s): Kentaro Nakamura (Tokyo Institute of Technology), Jagannath Devkota (National Energy Technology Laboratory)

5:45 AM
4141: Characteristics of CMUT with MXenes Diaphragm
Cizhu Luo, Fengxiu Wang, Lanjiang Song, Xinhua Guo
wuhan university of technology, China

5:55 AM
4214: Analysis of the Effect of Electrode Thickness on QCM Mass Sensitivity
Wei Pan, Xianhe Huang
University of Electronic Science and Technology of China, China

6:05 AM
4432: Robustness of Gold Nanoparticles on Gold Film Electrode for Sweat Analysis with Miniature Sono-Electroanalytical Platform
Xiang She, Xiaohe Wang, Pengfei Niu, Menglun Zhang, Wei Pang
Tianjin University, China

6:15 AM
4537: Study of Waveform Recovery by Deconvolution Using Simulated Hydrophone
Shin-Ichiro Umemura, Shin Yoshizawa
Tohoku University, Japan

6:25 AM
4860: Magnetic Bead-Mediated Vibration for the Detection of Circulating Tumor Cells in Blood Samples
Siyuan Xie, Linguo Yu, Tiemei Chen, Mian Chen, Xiangwei Lin, Haoming Lin, Xin Chen, Siping Chen
Shenzhen University, China

6:35 AM
4869: Impulse Measurements of SAW Sensor with Ultra-Wide-Band Hyperbolically Frequency-Modulated Reflectors
Dmitrij Smirnov{1}, Rimantas Miškinis{1}, Soumya Yandrapalli{2}, Victor Plessky{2}
{1}FTMC, Lithuania; {2}GVR Trade SA / EPFL, Switzerland

6:45 AM
5167: Practical Application of Active Damping for Measurement with Narrowband Ultrasonic Transducers
William Somerset{3}, Lei Kang{2}, Andrew Feeney{1}, Steve Dixon{3}
{1}University of Glasgow, United Kingdom; {2}University of Portsmouth, United Kingdom; {3}University of Warwick, United Kingdom

6:55 AM
5410: Numerical Analysis on Ultrasonic Sensing Mechanism of Fiber Gratings and Their Frequency Responses
Xianmei Wu, Jiayi Chen, Qi Yang, Bingwen An
Institute of Acoustics, Chinese Academy of Sciences, China

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-14: PUM: Ultrasonics Motors & Actuators (AM)
Session Chair(s): Masaya Takasaki (Saitama University)

5:45 AM
4212: Ultrasound Liquid Crystal Lens with Radial Focal Displacement
Jessica Onaka, Takahiro Iwase, Daisuke Koyama, Mami Matsukawa
Doshisha University, Japan

5:55 AM
4421: A Face-Shear Mode Piezoelectric Multilayer Actuator Based on Metamaterial Construction
Xiaopin Hu, Kang Yan, Dawei Wu
Nanjing University of Aeronautics and Astronautics, China

6:05 AM
4639: Force Characteristics of Disc-Shaped PZT Transducer for Underwater Acoustic Propulsion System
Yuan Qian{2}, Deqing Kong{1}, Kuribayashi Minoru Kurosawa{2}
{1}Muroran Institute of Technology, Japan; {2}Tokyo Institute of Technology, Japan

6:15 AM
5088: BNBTM and SCNN Lead-Free Ultrasonic Transducers for Underwater Propulsion System
Takumi Hirata{2}, Deqing Kong{2}, Yutaka Doshida{1}, Minoru Kurosawa{3}, Manabu Aoyagi{2}
{1}Ashikaga University, Japan; {2}Muroran Institute of Technology, Japan; {3}Tokyo Institute of Technology, Japan

6:25 AM
5150: Dynamic Resonant Frequency Control of Ultrasonic Transducer Using Dual Vibration Modes
Fangyi Wang{2}, Satori Hachisuka{2}, Hiroki Yokozawa{1}, Susumu Miyake{2}, Takeshi Morita{2}
{1}Nidec Corporation, Japan; {2}University of Tokyo, Japan

6:35 AM
5478: A Transducer for Micro Cryogenic Actuator Using Novel Preload Mechanism Without Bolt-Clamping
Takefumi Kanda, Kairi Yagi, Takumi Nishida, Daisuke Yamaguchi, Shuichi Wakimoto
Okayama University, Japan

6:45 AM
5504: Subminiature Underwater Propeller with Electrical Controllability of Steering
Lurui Zhao, Eun-Sok Kim
University of Southern California, United States

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-15: APR: Plate Wave Resonators (AM)
Session Chair(s): Tao Han (Shanghai Jiao Tong University), Michio Kadota (Tohoku University)

5:45 AM
4480: Comparative Study of Traditional and Broadband Piston Mode Designs of A1-Mode Resonators on Lithium Niobate
Yawei Li{2}, Yu-Po Wong{1}, Zhaohui Wu{2}, Qi Liang{2}, Keyuan Gong{2}, Jing-Fu Bao{2}, Ken-Ya Hashimoto{3}
{1}Chiba University, Japan; {2}University of Electronic Science and Technology of China, China; {3}University of Electronic Science and Technology of China/Chiba University, Japan

5:55 AM
4555: A Novel N79 Filter Using Solid-Mounted A1-Mode Resonator for 5G Applications
Bohua Peng{1}, Nianchu Hu{1}, Bin Jia{1}, Huilian Wang{2}
{1}EPIC MEMS (Xiamen) Co., Ltd, China; {2}Institute of Microelectronics, Chinese Academy of Sciences (CAS), China

6:05 AM
4803: Ring-Shaped Lamb Wave Resonator Based on LiNbO3 Thin Film with Resonant Frequency of A1/A3 Mode Above 6/17 GHz
Jie Zhou, Jieyu Liu, Ying Xie, Qinwen Xu, Zhongye Wu, Wenjuan Liu, Yao Cai, Chengliang Sun
Wuhan University, China

6:15 AM
5118: A Study of Monolithic Integrated Multiband Filters Based on Y124° Cut Lithium Niobate on Insulator (LNOI) Platform
Pengcheng Zheng, Shibin Zhang, Hongyan Zhou, Jinbo Wu, Liping Zhang, Tiangui You, Xin Ou
Shanghai Institute of Microsystem and Information Technology, China

6:25 AM
5205: High Performance Lamb Wave Contour Mode Resonator Based on Co-Sputtered Al0.78Sc0.22N Film
Zhifang Luo, Shuai Shao, Tao Wu
ShanghaiTech University, China

6:35 AM
5503: Design and Analysis of LiNbO3 High Order Asymmetric Lamb Wave Resonators with Composite Plate Structure
Yushuai Liu, Zhiyuan Gao, Yaoqing Lu, Tao Wu
Shanghaitech, China

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-16: TMU: Micromachined Ultrasonic Transducers III (AM)
Session Chair(s): Jessica Liu Strohmann (Qualcomm)

5:45 AM
4179: Real-Time Control of the Resonance Frequency of a Piezoelectric Micromachined Ultrasound Transducer for Airborne Applications
Marco Passoni, Niccolò Petrini, Fabio Quaglia
STMicroelectronics, Italy

5:55 AM
4277: Bowl-Shaped ZnO Ultrasonic Transducer for Photoacoustic/Ultrasonic Multimode Microscopy
Jinying Zhang{1}, Dongdong Zhao{1}, Defang Li{1}, Fengshuo Tian{1}, Weijiang Xu{3}, Xianmei Wu{2}
{1}Beijing Institute of Technology, China; {2}Institute of Acoustics, Chinese Academy of Sciences, China; {3}Polytechnique Hauts-de-France, China

6:05 AM
4470: Characterization and Modelling of Delay Line Based CMUTs
Erik Vilain Thomsen{2}, Kasper Fløng Pedersen{1}, Andreas Spandet Havreland{2}
{1}DTU, Denmark; {2}Technical University of Denmark - Health Technology, Denmark

6:15 AM
4476: Comparative Assessment of Plane Wave Imaging with 256-Element CMUT and Single Crystal Probes
Paolo Mattesini{2}, Alessandro Stuart Savoia{1}, Alessandro Ramalli{2}, Enrico Boni{2}, Piero Tortoli{2}
{1}Roma Tre University, Italy; {2}University of Florence, Italy

6:25 AM
4617: Towards the Development of Frequency Tunable PMUT
Kaustav Roy, Rudra Pratap
Indian Institute of Science, India

6:35 AM
4759: A Feasibility Study of a PMUT-Based Wearable Sensor for the Automatic Monitoring of Carotid Artery Parameters
Alessandro Stuart Savoia{1}, Riccardo Matera{3}, Fabio Quaglia{2}, Stefano Ricci{3}
{1}Roma Tre University, Italy; {2}ST Microelectronics, Italy; {3}University of Florence, Italy

6:45 AM
4847: Design of Sealed AlN PMUT for High-Quality Ultrasound Imaging
Yun Zhang, Chengjun Huang, Hang Gao
Institute of Microelectronics of the Chinese Academy, China

6:55 AM
5072: The Long-Term Reliability of Pre-Charged CMUTs for the Powering of Deep Implanted Devices
Marta Saccher{1}, Shinnosuke Kawasaki{1}, Ronald Dekker{2}
{1}Delft University of Technology, Netherlands; {2}Philips Research, Netherlands

7:05 AM
5429: Nonlinear Intermodal Coupling and Energy Transfer in ZnO PMUTs
Nishta Arora, Randhir Kumar, Rudra Pratap, Akshay Naik
Indian Institute of Science, Bengaluru, India

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-17: NAF: Acoustic Microfluidics (AM)
Session Chair(s): Long Meng (Shenzhen Institutes of Advanced Technology)

5:45 AM
4058: Theory of SAW-Based Acoustophoresis and its Application in the Design of Particle Separation Devices
Zixing Liu, Xiasheng Guo, Dong Zhang
Nanjing University, China

5:55 AM
4075: Performance Deterioration to GHz Bulk-Acoustic-Wave Resonator Induced by Throughput
Xingchen Li{1}, Xingli Xu{1}, Weiwei Cui{1}, Guanyu Zhang{1}, Mark Reed{2}
{1}Tianjin University, China; {2}Yale Univiersity, United States

6:05 AM
4093: How the Ultrasonic Parameters Affect the Mixing Performance of a Microfluidic Mixer Based on Acoustically Driven Microbubbles
Hao Wu, Cheng Zhou, Yufang Liu, Haixia Yu, Dachao Li
Tianjin University, China

6:15 AM
4447: Ultrahigh Frequency Surface Acoustic Wave Actuated Electrode-Free Digital Microfluidic Chip
Shuchang Liu, Weiwei Cui, Xuexin Duan, Wei Pang
Tianjin University, China

6:25 AM
4797: Acoustic Tensiometer for Microfluidic Sessile Drops
Umar Farooq, Xiufang Liu, Wei Zhou, Long Meng, Hairong Zheng
Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences, China

6:35 AM
5080: Enhanced Rayleigh Streaming in Resonant Cylindrical Shells
Qin Lin, Feiyan Cai, Fei Li, Xiangxiang Xia, Jinping Wang, Rujun Zhang, Hairong Zheng
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

6:45 AM
5117: Detection of Protein Binding by Shear Mode Ultrasonic Reflection Coefficients Using c-Axis Tilted ScAlN Film Above 100MHz
Yamashita Miho, Yanagitani Takahiko
Waseda University, Japan

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-18: PGA: General Physical Acoustics (AM)
Session Chair(s): Vincent Laude (Institut FEMTO-ST)

5:45 AM
4183: Design and Fabrication of a 3MHz 2D Array with 1-λ Pitch for Ultrasonic Modulation
Yizhe Sun, Haochen Kang, Gengxi Lu, Yushun Zeng, Robert Wodnicki, Qifa Zhou
University of Southern California, United States

5:55 AM
4459: An Analysis of Surface Acoustic Wave Modes of a Finite Solid Covered with Electrodes by Rayleigh-Ritz Method
Jinghui Wu{2}, Ji Wang{2}, Erasmo Carrera{3}, Honglang Li{1}
{1}National Center for Nanoscience and Technology, China; {2}Ningbo University, China; {3}Politecnico di Torino, Italy

6:05 AM
4494: Elastic Properties of Biomineralized Structures Measured by Ultrasonic Pulse-Echo Technique
Andrei Sotnikov{1}, Richard Best{2}, Igor Zlotnikov{2}, Hagen Schmidt{1}
{1}Leibniz IFW Dresden, Germany; {2}TU Dresden, Germany

6:15 AM
4525: Elastic Properties of ABS-Plastic Acoustic Metamaterial Produced by 3D Printing Method
Aleksandr Volodarskii, Natalia Shirgina, Aleksei Kokshayskii, Natalia Odina, Aleksander Korobov
Lomonosov Moscow State University, Russia

6:25 AM
4823: Numerical Determination of Primary and Interparticle Acoustic Radiation Force Between a Pair of Rings in a Standing Wave
Fatemeh Malekabadi, Serhat Yesilyurt
Sabanci University, Turkey

6:35 AM
4998: Surface Wave Characterization in Soft Solid Using Ultrafast Ultrasound Imaging
Héctor Alarcón, David Espindola
Universidad de O'Higgins, Chile

6:45 AM
5065: Two-Stage Ultrasonic Atomization Using a Gravity-Fed Pre-Stage
Balasubramanian Nallannan{1}, Ilkka Nissilä{1}, Mikko Seppänen{1}, Henri Siljanen{2}, Heikki Nieminen{1}
{1}Aalto University, Finland; {2}University of Eastern Finland, Finland

6:55 AM
5433: The Influence of the Liquid Salinity and Shell Composition on the Frequency Dependent Attenuation Characteristics and Apparent Shell Elasticity of Lipid-Coated Microbubbles
Aj Sojahrood{3}, Cj Yang{2}, P Nittayacharn{1}, C Counil{1}, Ac Deleon{1}, Aa Exner{1}, De Goertz{3}, Mc Kolios{2}
{1}Case Western University, United States; {2}Ryerson University, Canada; {3}Sunnybrook Health Science Center, Canada

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-19: MTC: Machine Learning in Tissue Characterization (AM)
Session Chair(s): Kay Raum (Charité – Universitätsmedizin Berlin)

5:45 AM
4023: Deep Learning Based Robust Attenuation Imaging and Quantification
Tripan Dipta Roy{1}, Souradip Sen{1}, Karthik Raj Katipally{3}, Charles Tremblay-Darveau{2}, Conner Pitts{2}, Deep Bera{3}
{1}Indian Institute of Technology Guwahati, India; {2}Philips Healthcare, United States; {3}Philips India Ltd., India

5:55 AM
4320: An Automatically Thyroid Nodules Feature Extraction and Description Network for Ultrasound Images
Ming Tian, Yue Zhao, Jing Jin
Harbin Institute of Technology, China

6:05 AM
4711: Classification of Breast Lesions with 3D Ultrasound: A Comparison Study Using Logistic Regression, Multilayer Perceptron, and Deep Learning
Thom de Rijk, Thomas van Den Heuvel, Chris de Korte
Radboudumc, Netherlands

6:15 AM
4853: Ultrasonic Evaluation of Liver Fibrosis Using the Homodyned K Distribution with an Artificial Neural Network Estimator
Anna Gao{1}, Shuicai Wu{1}, Dar-In Tai{2}, Zhuhuang Zhou{1}, Po-Hsiang Tsui{3}
{1}Beijing University of Technology, China; {2}Gastroenterology and Hepatology, China; {3}Institute for Radiological Research, China

6:25 AM
5149: Microultrasound-Based Machine Learning Classifier Differentiates Low- and High-Grade Glioma via Acoustic Impedance Maps in Finite Element Analysis
Hannah Thomson{2}, Shufan Yang{3}, Thomas Stritch{1}, Mitch Baldwin{1}, Sandy Cochran{2}
{1}Stryker Medical Devices, Ireland; {1}Stryker Medical Devices, United States; {2}University of Glasgow, United Kingdom; {3}University of Napier, United Kingdom

6:35 AM
5188: Quantitative Ultrasound and Artificial Intelligence for Staging Hepatic Steatosis in Nonalcoholic Fatty Liver Disease, Using Conventional Ultrasound Imaging, Validated with Histopathology
Gert Weijers, Isabelle Munsterman, Johan Thijssen, Joost Drenth, Eric Tjwa, Chris de Korte
Radboud University Medical Center, Netherlands

Thursday, September 16: 5:45 AM - 7:45 AM (Eastern Time)
E1P-20: PNL: Nonlinear Physical Acoustics & PTF: Thin Films (AM)
Session Chair(s): Ji Wang (Ningbo University, China)

5:45 AM
4127: Heat Generation Induced by Cavitation Clouds with Ultrasound Contrast Agent in HIFU Field：A Phantom Study
Hua Cao{1}, Yue Yuan{2}, Jingke Zhang{2}, Fu-Feng Lee{2}, Jianwen Luo{2}, Yu An{2}
{1}Chongqing Medical University, China; {2}Tsinghua University, China

5:55 AM
4278: Effect of Nonlinear Wave Propagation on Temperature Rise in High Frequency Imaging
Ehsan Jafarzadeh, Anthony Sinclair
University of Toronto, Canada

6:05 AM
4324: Measurement of the Orientational Angle of Liquid Crystal Molecules Induced by Ultrasound Vibration
Takahiro Iwase{1}, Jessica Onaka{1}, Daisuke Koyama{1}, Akira Emoto{2}, Mami Matsukawa{1}
{1}Doshisha university, Japan; {2}Tokushima university, Japan

6:15 AM
5147: Harmonic Scattering of an Ultrasonic Wave from a Localized Layered Hysteretic Damage
Pravinkumar Ghodake
Indian Institute of Technology Bombay, Mumbai, India

6:25 AM
5157: Analysis of Excitation Signal Characteristics Associated with Energy-Efficient Acoustic Cavitation
Sara Maghami, Örjan Johansson
Luleå university of technology, Sweden

6:35 AM
4241: Polarity Control of (0001) Oriented AlN Films by Si Doping and Applications to Polarity Inverted SiAlN/AlN Film Balk Acoustic Wave Resonators
Jun Sekimoto, Masashi Suzuki, Shoji Kakio
University of Yamanashi, Japan

6:45 AM
4427: c-Axis-Tilted ScAlN Film on Silicon Substrate for Surface Acoustic Wave Device
Takumi Tominaga{1}, Shinji Takayanagi{1}, Takahiko Yanagitani{2}
{1}Doshisha University, Japan; {2}Waseda University, Japan

6:55 AM
5126: Experimental and Theoretical Investigation of kt^2 and Velocity in YbGaN Films by DFT
Yuna Koike{1}, Junjun Jia{1}, Suzuki Masashi{2}, Takahiko Yanagitani{1}
{1}Waseda University, Japan; {2}Yamanashi University, Japan

7:05 AM
5495: GHz BAW Piezoelectric Transformers for Passive Voltage Amplification Using the Epitaxial ZnO Thin Films
Hiroki Kishi, Shiori Kobayashi, Takahiko Yanagitani
Waseda university, Japan

Thursday, September 16: 8:00 AM -10:00 AM (Eastern Time)
E2L-01: MTN: Theranostics
Session Chair(s): Helen Mulvana (University of Strathclyde), Mark Borden (University of Colorado)

8:00 AM
4603: Turn Up the Heat or Pop the Bubble? Clinical Translation of Ultrasound-Enhanced Drug Delivery to Solid Tumours
Constantin Coussios{2}, Michael Gray{2}, Cameron Smith{2}, Prateek Katti{2}, Laura Spiers{2}, Paul Lyon{1}, Robert Carlisle{2}
{1}Oxford University Hospitals NHS Trust, United Kingdom; {2}University of Oxford, United Kingdom

8:30 AM
5370: Development of an Integrated Photoacoustic-Guided Laser Ablation Intracardiac Theranostic System
Maryam Basij{2}, Samuel John{2}, Loay Kabbani{1}, Mohammad Mehrmohammadi{2}
{1}Henry Ford Hospital, United States; {2}Wayne State University, United States

8:45 AM
5257: The Effect of Pulse Length on Theranostic Ultrasound-Mediated Blood-Brain Barrier Opening Volume, Closing Timeline, and Cavitation Mapping in Vivo
Alec Batts, Robin Ji, Rebecca Noel, Alina Kline-Schoder, Elisa Konofagou
Columbia University, United States

9:00 AM
5389: Targeted Anti-Cancer Provascular Therapy Using Ultrasound-Stimulated Microbubbles and Nitrites to Increase Radiotherapy Efficacy
Simon Michon, Francis Rodier, François Yu
Université de Montréal, Canada

9:15 AM
5376: Dual Mode CMUT Array Operation for Skull Imaging and Passive Acoustic Monitoring in Transcranial Ultrasound
Sait Kilinc, Hohyun Lee, Costas Arvanitis, Levent Degertekin
Georgia Institute of Technology, United States

9:30 AM
4464: Sonobiopsy Increases Yield of Cell-Free DNA
Christopher Pacia, Lifei Zhu, Yimei Yue, Jinyun Yuan, Hong Chen
Washington University in St. Louis, United States

9:45 AM
4761: Ultrasound Imaging for Sonodynamic Therapy via Using Ultrasmall Silicate Nanoparticles
Nisi Zhang{1}, Mengxuan Wang{1}, Yijia Liu{1}, Deshang Hou{1}, Katherine Ferrara{2}, Zhifei Dai{1}
{1}Peking University, China; {2}Stanford University, United States

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Thursday, September 16: 8:00 AM -10:00 AM (Eastern Time)
E2L-02: MBF: Advanced & Innovative Flow Imaging
Session Chair(s): Lasse Lovstakken (Norwegian University of Science and Technology), Damien Garcia (CREATIS insa-lyon)

8:00 AM
4668: Coronary Ultrafast Doppler Angiography Using Motion-Adaptive Temporal Sliding Windows and SVD Clutter Filter
Naiyuan Zhang{2}, Minh Nguyen{1}, Luc Mertens{1}, David Barron{1}, Olivier Villemain{1}, Jérôme Baranger{1}
{1}Hospital for Sick Children, Canada; {2}University of Toronto, Canada

8:15 AM
5129: Ultrafast Doppler Imaging Reveals Quantitative Hemodynamic Maps of the Human Liver and Gives Access to Local Hepatic Pulse Wave Velocity
Sofiane Décombas-Deschamps{3}, Hanna Bendjador{3}, Marco Dioguardi Burgio{2}, Riccardo Sartoris{1}, Bernard Van Beers{2}, Valérie Vilgrain{2}, Mickael Tanter{3}, Thomas Deffieux{3}
{1}AP-HP. Nord Université de Paris, France; {2}Centre de recherche sur l'inflammation, AP-HP. Nord Université de Paris, Hôpital Beaujon, France; {3}Physics for medicine, Paris, France

8:30 AM
4723: First In-Vivo Mapping of 2D Intraosseous Blood Flow in the Human Tibia
Sébastien Salles, Guillaume Renaud
Laboratoire d'Imagerie Biomédicale, Sorbonne University, France

8:45 AM
5323: Model-Based Regularization for Non-Invasive Intraventricular Flow and Pressure Estimates in 4D Ultrasound Imaging
Thomas Grønli, Morten Smedsrud Wigen, Annichen Søyland Daae, Patrick Segers, Asbjørn Støylen, Lasse Løvstakken, Solveig Fadnes
Norwegian University of Science and Technology, Belgium; Norwegian University of Science and Technology, Norway

9:00 AM
4240: In Vivo Assessment of Diabetic Kidney Disease Using Ultrasound Localization Microscopy
Jingke Zhang{2}, Hong Zhang{1}, Yi Yang{2}, Qiong He{2}, Lanyan Qiu{1}, Linxue Qian{1}, Jianwen Luo{2}
{1}Beijing Friendship Hospital, China; {2}Tsinghua University, China

9:15 AM
4239: In Vivo Visualization of Wall Shear Stress on Mice Carotid Artery by Using High-Frequency Ultrasound Vector Doppler Imaging (HFVDI)
Yu-Hsiang Huang, Chih-Chung Huang
National Cheng Kung University, Taiwan

9:30 AM
4818: Ultrasound Localization Microscopy of a Mouse Model of Aging
Matthew Lowerison, Nathiya Sekaran, Zhijie Dong, Xi Chen, Daniel Llano, Pengfei Song
University of Illinois at Urbana-Champaign, United States

9:45 AM
4669: Using Ultrafast Diverging Waves, Power Doppler and Resistivity Index Map to Assess Brain Perfusion on Human Neonates
Nikan Fakhari{2}, Julien Aguet{1}, Minh Nguyen{1}, Luc Mertens{1}, David Barron{1}, Olivier Villemain{2}, Jérôme Baranger{1}
{1}SickKids, Canada; {2}University of Toronto / SickKids, Canada

Thursday, September 16: 8:00 AM -10:00 AM (Eastern Time)
E2L-03: NAS: Acoustic Sensors & NAI: Acoustic Imaging
Session Chair(s): Jafar Saniie (Illinois Institute of Technology), David Greve (Carnegie Mellon University)

8:00 AM
4279: Soft Ultrasonic Patches for Continuous Monitoring of Deep Tissues
Sheng Xu
University of California, San Diego, United States

8:30 AM
4570: High Sensitivity Piezoelectric MEMS Microphones Based on AlN with Cavity-SOI
Bohao Hu, Binghui Lin, Wenjuan Liu, Chengliang Sun
Institute of Technological Sciences, Wuhan University, China

8:45 AM
4296: Development of Harmonic Surface Acoustic Wave Sensors for Sensitive Detection of Greenhouse Gases
Jagannath Devkota{2}, David Greve{1}, Tao Hong{2}, Paul Ohodnicki{3}, Michael Buric{2}
{1}Carnegie Mellon University, United States; {2}National Energy Technology Laboratory, United States; {3}University of Pittsburgh, United States

9:00 AM
4532: Electroactive Diffraction Gratings for the Generation of Acoustic Vortex Beams
Rubén Darío Muelas Hurtado{1}, Joao Luis Ealo Cuello{1}, Karen Volke Sepúlveda{2}
{1}Universidad del Valle, Colombia; {2}Universidad Nacional Autónoma de México, Mexico

9:15 AM
5434: Gigahertz Ultrasonic Imaging of Nematodes in Liquids, Soil and Air
Justin Kuo{2}, Anuj Baskota{2}, Scott Zimmerman{2}, Frank Hay{1}, Sarah Pethybridge{1}, Amit Lal{2}
{1}Cornell University, United States; {2}Geegah Inc, United States

9:30 AM
5402: Imaging and Detection of Botrytis Cinerea with Gigahertz Ultrasonic Imager
Yutong Liu{1}, Justin Kuo{2}, Kerik Cox{1}, Justine Heuvel{1}, Kirstin Petersen{1}, Amit Lal{2}
{1}Cornell University, United States; {2}Cornell University/Geegah Inc., United States

9:45 AM
4930: Feasibility of 4 GHz Half-Wavelength Solid Contact Ultrasonic Microscopy
Paul van Neer, Benoit Quesson, Selman Tamer, Kodai Hatakeyama, Maarten van Es, Martijn van Riel, Daniele Piras
TNO, Netherlands

Thursday, September 16: 8:00 AM -10:00 AM (Eastern Time)
E2L-04: PPA: Physical Acoustics
Session Chair(s): Jan Brown (Jan Brown Consulting)

8:00 AM
4822: New Fascinating Properties and Potential Applications of Love Surface Waves
Piotr Kiełczyński
Institute of Fundamental Technological Research, Polish Academy of Sciences, Poland

8:30 AM
4059: Theoretical and Experimental Study of Propagating Lamb Wave Mode Caused by the Saw in Glass Plate/Thin Water Layer/128YX-LiNbO3 Structure
Jun Kondoh, Moe Tsubouchi, Ryota Mitsuyoshi, Yota Terakawa
Shizuoka University, Japan

8:45 AM
4280: Nonexistent Surface Acoustic Waves on the Basal Plane of Graphite
Alexei Maznev{1}, Arthur Every{2}
{1}MIT, United States; {2}University of Witwatersrand, South Africa

9:00 AM
4646: Animating Sound Using Neural-Network Multiplexed Holograms
Athanasios Athanassiadis{1}, Lennart Schlieder{2}, Kai Melde{1}, Valentin Volchkov{2}, Bernhard Schölkopf{2}, Peer Fischer{1}
{1}Max Planck Institute for Intelligent Systems, Stuttgart, Germany; {2}Max Planck Institute for Intelligent Systems, Tübingen, Germany

9:15 AM
4223: Powder Leveling Using Flexural Vibration of a V-Shaped Plate
Natsumi Nakaoka{2}, Daisuke Koyama{1}
{1}Doshisha University, Japan; {2}Doshisha Univesity, Japan

9:30 AM
5398: Accelerating Fullwave Simulations Using the Fourier Neural Operator
Thomas Kierski{6}, Zongyi Li{1}, Sean Huver{3}, Jacob McCall{2}, Kamyar Azizzadenesheli{4}, Paul Dayton{7}, Anima Anandkumar{1}, Gianmarco Pinton{5}
{1}California Institute of Technology, United States; {2}North Carolina State University, United States; {3}NVIDIA, United States; {4}Purdue University, United States; {5}University of North Carolina - Chapel Hill, United States; {6}University of North Ca

9:45 AM
4097: Sub-Diffractive Acoustic Vortices by Nonlinear Mixing
Noé Jiménez{3}, Joao Ealo{2}, Rubén Muelas-Hurtado{2}, Aroune Duclos{1}, Vicent Romero-García{1}
{1}Le Mans Université, France; {2}Universidad del Valle, Colombia; {3}Universitat Politècnica de València, Spain

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Thursday, September 16: 8:00 AM -10:00 AM (Eastern Time)
E2L-05: ABD: BAW Devices
Session Chair(s): Amelie Hagelauer (University of Bayreuth), Rich Ruby (Broadcom)

8:00 AM
4961: 5G: Revolution or Evolution?
Gernot Fattinger, Mudar Al-Joumayly, Alfred Gimenez, Waleed Yusuf, Ralph Rothemund, Fabien Dumont
Qorvo Inc., United States

8:30 AM
4307: Second-Order Nonlinearity of Amorphous SiOF Films in FBARs : Existence of Structural Anisotropy in Amorphous Films
Taisei Irieda{2}, Toshio Nishizawa{2}, Shinji Taniguchi{1}, Masanori Ueda{2}, Ken-Ya Hashimoto{3}
{1}TAIYO YUDEN Co., Ltd., Japan; {2}TAIYO YUDEN Mobile Technology Co., Ltd., Japan; {3}University of Electronic Science and Technology of China, Chiba University, Japan

8:45 AM
4378: Full 3D FEM Simulation of Thickness Shear Bulk Acoustic Resonators on Ln Assisted by Hierarchical Cascading Technique
Yiwen He{2}, Yu-Po Wong{1}, Ting Wu{2}, Jingfu Bao{2}, Ken-Ya Hashimoto{3}
{1}Chiba University, Japan; {2}University of Electronic Science and Technology of China, China; {3}University of Electronic Science and Technology of China/Chiba University, Japan

9:00 AM
4850: 4.2 GHz LiNbO3 Film Bulk Acoustic Resonator
Marie Bousquet{3}, Pierre Perreau{3}, Alice Joulie{3}, Fanny Delaguillaumie{3}, Catherine Maeder-Pachurka{3}, Gaël Castellan{3}, Grégory Enyedi{3}, Julien Delprato{3}, Frédéric Mazen{3}, Thierry Laroche{1}, Isabelle Huyet{2}, Alexandre Clairet{1}, Sylvain
{1}frecnsys, France; {2}SOITEC SA, France; {3}Université Grenoble Alpes, CEA-Leti, France

9:15 AM
5295: High-Frequency and High-Coupling Crystalline Y-Cut Lithium Niobate Film Bulk Acoustic Resonator (YBAR)
Soumya Yandrapalli{1}, Seniz Esra Kucuk{1}, Victor Plessky{2}, Patrick Turner{2}, Luis Guillermo Villanueva{1}
{1}EPFL, Switzerland; {2}Resonant Inc, Switzerland; {2}Resonant Inc, United States

9:30 AM
5290: High Rejection, 160MHz Bandwidth, High Q-Factor 6 GHz RF Filters for Wi-Fi 6E Manufactured in a Novel BAW Process
Ramakrishna Vetury, Daeho Kim, Frank Bi, Mary Winters, Rohan Houlden, David Aichele, Jeff Shealy
Akoustis, United States

9:45 AM
5055: An Improved Formula for Estimating the Stored Energy in a BAW Resonator from its Measured S11 Parameters
Renfeng Jin, Zongliang Cao, Mihir Patel, Ben Abbott, David Feld
Skyworks Inc, United States

Thursday, September 16: 10:30 AM - 11:45 AM (Eastern Time)
E3L-01: MTH: Neuromodulation
Session Chair(s): Hairong Zheng (Shenzhen Institutes of Advanced Technology)

10:30 AM
5493: Transcranial Focused Ultrasound (tFUS) Pulsation Modulates Epileptic Neural Activity and Physiological Symptoms on a Pentylenetetrazol-Injected Rat Model In Vivo
Minseok Koo, Taewon Choi, Jinhyoung Park
Sungkyunkwan University, Korea

10:45 AM
4389: Bilateral Ultrasound Neuromodulation for the Treatment of Parkinson's Disease Model Mouse Using Holographic Lens
Hui Zhou, Xiangxiang Xia, Lili Niu, Long Meng, Hairong Zheng
Shenzhen Institutes of Advanced Technology, China

11:00 AM
4953: Spatio-Temporal Analysis of Focused Ultrasound (FUS)-Evoked Local Field Potentials in an Ex Vivo Mouse Hippocampal Model
Ivan Suarez-Castellanos{3}, Elena Dossi{2}, Jérémy Vion-Bailly{3}, Léa Salette{2}, Jean-Yves Chapelon{3}, Alexandre Carpentier{1}, Gilles Huberfeld{1}, William Apoutou N'Djin{3}
{1}AP-HP, France; {2}College de France, France; {3}INSERM, France

11:15 AM
5298: Ultrasound Neurostimulation Enhanced with Neuron-Bound Piezoelectric Nanotransducers
Tomas Jordan, Mikaela O'Brien, Michael Hoppa, Geoffrey Luke
Dartmouth College, United States

Thursday, September 16: 10:30 AM - 11:45 AM (Eastern Time)
E3L-02: MBB: Beamforming II
Session Chair(s): Robert Rohling (University of British Columbia)

10:30 AM
5225: Patient Adapted Multi-Covariate Imaging of Sub-Resolution Targets
Rifat Ahmed, Gregg Trahey, William Walker
Duke University, United States

10:45 AM
5212: 3D Ultrasound Localization Microscopy of the Whole Rat Brain Using a 15 MHz Row-Column Addressed Probe: Microbubbles Detection Enhancement Using XDoppler Imaging
Adrien Bertolo{2}, Oscar Demeulenaere{2}, Jack Sauvage{1}, Mickael Tanter{2}, Mathieu Pernot{2}, Thomas Deffieux{2}
{1}Laboratory of Cardiovascular Imaging and Dynamics, Belgium; {2}Physics for Medicine Paris, Inserm U1273, ESPCI Paris, PSL University, CNRS FRE 2031, France

11:00 AM
5272: Real-Time Universal Synthetic Transmit Aperture Beamforming with Refocus
Dongwoon Hyun{1}, Jeremy Dahl{1}, Nick Bottenus{2}
{1}Stanford University, United States; {2}University of Colorado Boulder, United States

Thursday, September 16: 10:30 AM - 11:45 AM (Eastern Time)
E3L-03: MEL: Elasticity Imaging in Anisotropic Organs
Session Chair(s): Caterina Gallippi (University of North Carolina)

10:30 AM
4285: Quantification of Human Skin Anisotropy In Vivo with Acoustic Micro-Tapping OCE and Polarization-Sensitive OCT
Mitchell Kirby, Peijun Tang, Maju Kuriakose, Hong-Cin Liou, Russell Ettinger, Samuel Mandell, Ruikang Wang, Matthew O'Donnell, Ivan Pelivanov
University of Washington, United States

10:45 AM
4810: A Two-Point Shear Wave Elastography Method to Assess Muscle Stiffness In Vivo
Thomas Poulard{1}, Damien Bachasson{2}, Jean-Luc Gennisson{1}
{1}BioMaps, Université Paris-Saclay, CEA, CNRS, Inserm, France; {2}Institut de Myologie, Neuromuscular Physiology and Evaluation Laboratory, France

11:00 AM
5102: Direct in Plane Elastic Anisotropy Factor Quantification with Inclined Push Beams in Muscles
Ha Hien Phuong Ngo{1}, Thomas Frappart{2}, Christophe Fraschini{2}, Jean-Luc Gennisson{1}
{1}BIOMAPS, France; {2}Supersonic Imagine, France

11:15 AM
5384: Shear Shock Wave Injury In Vivo: High Frame-Rate Ultrasound Observation and Histological Assessment
Sandhya Chandrasekaran{2}, Francisco Santibanez{3}, Ruth Vorder Bruegge{3}, Tyler Long{3}, Tim Nichols{3}, Jason Kait{1}, Cameron R. Dale Bass{1}, Gianmarco Pinton{3}
{1}Duke University, United States; {2}North Carolina State University, United States; {3}University of North Carolina at Chapel Hill, United States

Thursday, September 16: 10:30 AM - 11:45 AM (Eastern Time)
E3L-04: TMU: PMUT
Session Chair(s): Alessandro Savoia (Università degli Studi Roma Tre), Susan Trolier-Mckinstry (Penn State University)

10:30 AM
5017: Commercialization of PMUT-Based Ultrasonic Time-of-Flight Range Sensors
David Horsley{2}, Richard Przybyla{1}, Mitchell Kline{1}, Oleg Izyumin{1}, Stefon Shelton{1}, Fabian Goericke{1}, Benjamin Eovino{1}
{1}Chirp Microsystems, United States; {2}UC Davis, United States

10:45 AM
4489: Silicon-on-Nothing ScAlN pMUTs
David Sze Wai Choong{1}, Daniel Ssu-Han Chen{1}, Duan Jian Goh{1}, Jihang Liu{1}, Sagnik Ghosh{1}, Yul Koh{1}, Sharma Jaibir{1}, Merugu Srinivas{1}, Fabio Quaglia{4}, Marco Ferrera{4}, Alessandro Savoia{3}, Eldwin Jiaqiang Ng{2}
{1}Institute of Microelectronics, Singapore; {2}Institute of Microelectronics, A-STAR (Agency for Science, Technology and Research), Singapore; {3}Roma Tre University, Italy; {4}STMicroelectronics, Italy

11:00 AM
4178: A Novel 6 MHz Phased Array Piezoelectric Micromachined Ultrasound Transducer (pMUT) with 128 Elements for Medical Imaging
Sina Sadeghpour{2}, Ekaterina Zilorina{1}, Jan D'Hooge{1}, Michael Kraft{2}
{1}KU Leuven, Belgium; {2}KU Leuven, ESAT, MNS, Belgium

11:15 AM
4752: Design, Fabrication, Characterization, and System Integration of a 1-D PMUT Array for Medical Ultrasound Imaging
Alessandro Stuart Savoia{1}, Enrico Boni{3}, Carlo Prelini{2}, Domenico Giusti{2}, Marco Ferrera{2}, Piero Tortoli{3}, Fabio Quaglia{2}
{1}Roma Tre University, Italy; {2}STMicroelectronics, Italy; {3}University of Florence, Italy

11:30 AM
4269: Laser-Micromachined, Dual-Resonant (17/34MHz) Ultrasound Transducer with Single Electrical Connection for Forward-Viewing Guidance of a sub-mm, Robotically-Steerable Guidewire System
Graham Collins{2}, Achraj Sarma{2}, Stephan Strassle Rojas{2}, Zachary Bercu{1}, Jaydev P. Desai{2}, Brooks Lindsey{2}
{1}Emory University, United States; {2}Georgia Institute of Technology, United States

Thursday, September 16: 10:30 AM - 11:45 AM (Eastern Time)
E3L-05: MIM: Super-Resolution Imaging II (AM)
Session Chair(s): Kang Kim (University of Pittsburgh), Jeremy Dahl (Stanford University)

10:30 AM
4760: Complex Phantoms and Live Cynomolgus Monkey Experiments for Transcranial Ultrasound Small Vascular Imaging Based on Chirp Coded Excitation
Yabo Yang{2}, Meiling Liang{2}, Jiacheng Liu{2}, Yujin Zong{2}, Ayache Bouakaz{1}, Mingxi Wan{2}
{1}e Imagerie et Cerveau, Inserm UMR U930, Université François Rabelais, France; {2}School of Life Science and Technology, Xi'an Jiaotong University, China

10:45 AM
4297: Super Resolution Ultrasound Blood Flow Imaging of the Posterior Eye for Glaucoma
Xuejun Qian{2}, Chengwu Huang{1}, Runze Li{2}, K. Kirk Shung{2}, Mark Humayun{2}, Shigao Chen{1}, Qifa Zhou{2}
{1}Mayo Clinic College of Medicine and Science, United States; {2}University of Southern California, United States

11:00 AM
5028: Super Resolution Imaging Nanodroplets with Multi-Frequency Hemispherical Phased Array
Lulu Deng, Harriet Lea-Banks, Ryan Jones, Meaghan O'Reilly, Kullervo Hynynen
Sunnybrook Research Institute, Canada

11:15 AM
5432: Aberration Correction in Ultrasound Localization Microscopy Using a Spatiotemporal Matrix Image Formation Framework
Alice Wu{2}, Vincent Perrot{2}, Jonathan Porée{2}, Hatim Belgharbi{2}, Chloé Bourquin{1}, Michael Chassé{3}, Jean Provost{2}
{1}Polytechnique, Canada; {2}Polytechnique Montréal, Canada; {3}Université de Montréal, Canada