2025ISNA Nanjing

2025 International Symposium on Nonlinear Acoustics

2025国际非线性声学大会

Booklet of the Conference

June 30th - July 4th, 2025

Shangri-La Hotel, Nanjing, China

Chairs: Dong Zhang and Desen Yang

Host/Organizer

Department of Acoustics, School of Physcis
Nanjing University

Co-organizers

The Acoustical Society of China
Acoustical Society of America
Center for Theoretical Physics of Complex Systems
Key Laboratory of Modern Acoustics
Jiangsu Physical Society
Jiangsu Provincial Physical Science Research Center

2025ISNA Nanjing

中国声学学会 The Acoustical Society of China

ASA Acoustical Society of America

近代声学教育部重点实验室 KEY LABORATORY OF MODERN ACOUSTICS, MINISTRY OF EDUCATION

江苏省物理学会 Jiangsu Physical Society

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Message from the 2025 International Symposium on Nonlinear Acoustics

Prof. Dong Zhang
Department of Acoustics, School of Physics
Nanjing University
China

Prof. Desen Yang
College of Underwater Acoustic Engineering
Harbin Engineering University
China

Welcome to the 2025 International Symposium on Nonlinear Acoustics, which will take place in the beautiful city of Nanjing, China, from June 30th to July 4th, 2025. We are thrilled and deeply honored to host this prestigious event, gathering researchers, academics, and professionals from across the globe to foster scientific exchange, generate innovative ideas, and inspire groundbreaking projects in the field of nonlinear acoustics.

The Institute of Acoustics at Nanjing University was founded by Prof. Rongjue Wei in 1954. It is the top acoustics department among Chinese universities, and has broad research directions, such as physical acoustics, nonlinear acoustics, biomedical ultrasound, photoacoustics, transducer engineering, electroacoustics and audio acoustics.

Nanjing, a city steeped in history and culture, serves as the capital of Jiangsu province and stands as a key center for education, research, and innovation in China. Situated along the Yangtze River, Nanjing is one of China's Four Great Ancient Capitals, known for its lush green parks, scenic lakes, and historical monuments that attract visitors from around the world. We look forward to welcoming you to Nanjing, China, and to an enriching and inspiring symposium in 2025.

Sincerely,

Committees

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- Ph. Blanc-Benon (France)
- R. O. Cleveland (UK)
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- L. A. Ostrovsky (USA/Russia)
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- X. M. Wang (The Institute of Acoustics of the Chinese Academy of Science)
- J. Yang (The Institute of Acoustics of the Chinese Academy of Science)
- Y. F. Zhou (Chongqing Medical University)

J. Tu (Nanjing University), Local Organization Secretary, 2025isna@gmail.com

2025 International Symposium on Nonlinear Acoustics
2025国际非线性声学大会

Practical Information

Conference Venue: Shangri-La Hotel

329 Zhongyang Road, Gulou District, Nanjing, Jiangsu Province 210037 China
Tel: +86-25-86308888
Email: nanjing@shangri-la.com

Accommodation

Check-in time: 14:00
Check-out time: 12:00

Breakfast

For those attendees staying at the Shangri-La Hotel with the special group rate (TSP280624), complimentary breakfast will be served daily by the Shangri-La Hotel.

Lunch

Complimentary lunch buffet is served on the 2nd floor of the Shangri-La Hotel each day (12:00-14:00) for all attendees (resident and day attendees).

Dinner

Monday: Welcome Reception. The welcome reception will take place on the evening of Monday, June 30th at 18:00 in the Zijin Room (5th floor) at the Shangri-La Hotel.

Tuesday: Banquet Dinner. The banquet dinner will take place on the evening of Tuesday, July 1st between 18:30-20:30 at the Shangri-La Hotel. Tickets for this should have been purchased separately.

Conference Venue

Shangri-La Hotel

Venue Address:

329 Zhongyang Road, Gulou District, Nanjing, Jiangsu Province 210037 China

Tel: +86-25-86308888

Email: nanjing@shangri-la.com

https://www.shangri-la.com/nanjing/shangrila/

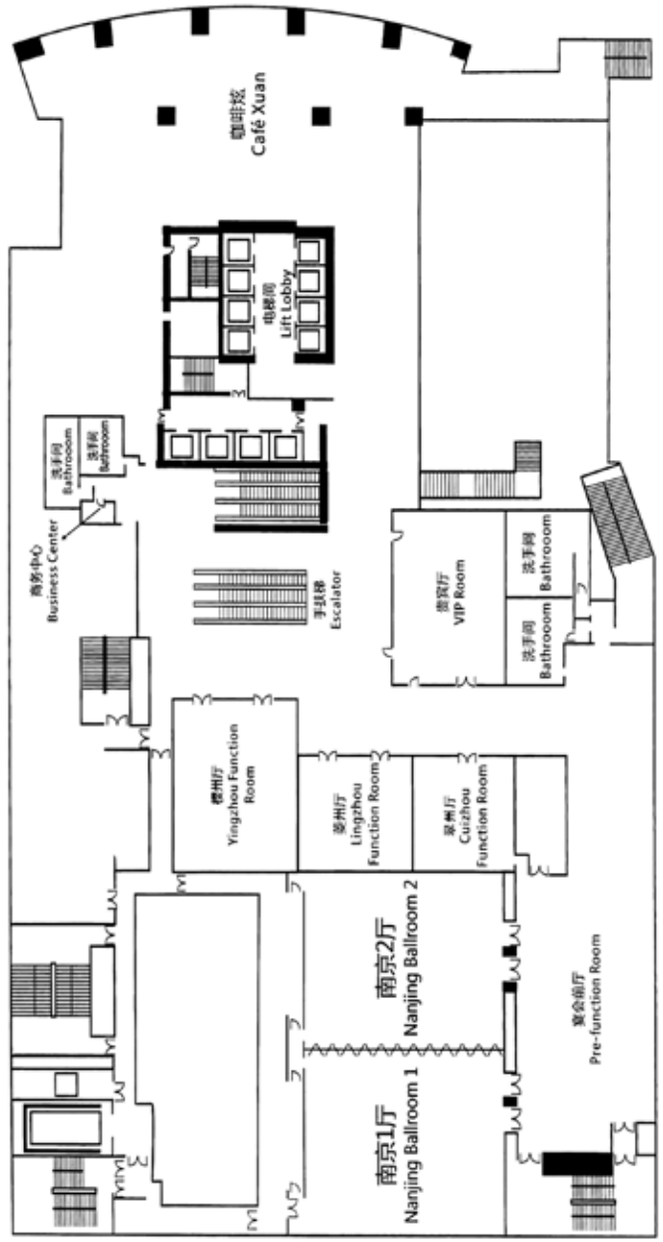
Transportation:

1.Nanjing Lukou International Airport: about 46 km by Taxi or 19 stops by Metro

2.Nanjing Railway Station: about 5.1 km by Taxi or 1 stop by Metro

3.Nanjing South Railway Station: about 17 km by Taxi or 12 stops by Metro

Venue Plans



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Sponsors and Exhibitors

Center for Theoretical Physics of Complex Systems

Jiangsu Provincial Physical Science Research Center

Oral Presentation Guide

- In the scientific sessions, each invited speaker will have a total of 20 minutes including Q&A, while regular oral presentation will have a total of 15 minutes including Q&A.
- In the plenary lecture sessions, the total time allotted to each speaker is 30 minutes including Q&A.
- PC laptops, computer projectors, and laser pointers will be provided in all lecture sessions, normal audio equipment such as microphones will be provided as well.
- Speaks will be required to use the provided PC laptop. No option will be provided for presenters to use their own laptops for presentations.
- Avoid Font Problems: Since your computer may have sophisticated fonts (such as special equation symbols) that the conference computers do not have, it is suggested that when you save your PowerPoint presentations, use “Save As” from your “File” pull-down menu. When a dialog box pops up, click on the “Tools” menu on that dialog box and select “Save Options”. Then, check the option “Embed true type fonts”. Click “OK” and then click “Save”. This allows you to include the fonts you are using in your presentations to minimize the font incompatibility problems. Otherwise, any fonts that are not recognized by the conference computers would be incomprehensible. In addition to the default “.pptx” file format, we suggest that you also save a copy of your presentations in the “.ppsx” (PowerPoint Show) format for safe (the “.ppsx” version may also include some of the special fonts in your presentations). If you have a full version of Adobe Acrobat, we suggest you also save (or print) your presentations into a “.pdf” format and thus you will be able to use the free Adobe Reader software to present in case nothing else would work.
- Authors should bring slides files on a **USB** drive to load onto the provided computer in **Corresponding Session Rooms**, and check the compatibility in advance. The time available for uploading and reviewing your presentation files is listed as follows:

Tuesday	**July 1st: 7:30-8:00 or 13:00-13:30**
Wednesday	**July 2nd: 7:30-8:00 or 13:00-13:30**
Thursday	**July 3rd: 7:30-8:00 or 13:00-13:30**
Friday	**July 4th: 7:30-8:00**

Poster Presentation Guide

- Poster boards and fastening materials will be provided. The maximum and recommended poster size is 120 cm (height) x 90 cm (width).
- The poster session will be located outside Nanjing Ball Room on Tuesday, July 1st, 2025. Authors are required to post their posters on the boards before 12:30 PM.

Condensed Program

Sunday, June 29th

16:00-20:00	**Registration**

Monday, June 30th

8:30-18:00	**Registration**
Short Courses (*Nanjing Ballroom 1*)	
9:00-10:00	**Nonlinear acoustics of fluids** Oleg A. Sapozhnikov *Moscow State University, Russia*
10:00-10:30	**Coffee Break**
10:30-11:30	**Nonlinear acoustics of solids** Mark F. Hamilton *University of Texas at Austin, USA*
12:00-14:00	**Lunch Buffet (*Café Xuan*)**
14:00-15:00	**Visualization of acoustic field with applications in identifying noise sources** Weikang Jiang *Shanghai Jiaotong University, China*
15:00-15:30	**Coffee Break**
15:30-16:30	**Parametric loudspeaker: Theory, advancement, and applications** Jun Yang *Institute of Acoustics, Chinese Academy of Sciences, China*
16:30-17:30	**Ultrasound Brain–Machine Interface: Principles, Technologies, and Emerging Applications** Dawei Wu *Nanjing University of Aeronautics and Astronautics, China*
18:00-20:00	**Welcome Reception (*Zijin Room, 5th floor*)**

Condensed Program

Tuesday, July 1st

8:30-18:00	**Registration**	
Opening Ceremony (*Nanjing Ballroom 1*)		
8:00-8:30	**1. Welcome speech** **2. Folk music performance**	
8:30-8:40	**Group photo**	
8:40-9:10	**Plenary Talk:** Magnetic Microrobots for Precision Biomedical Applications Qingsong Xu *University of Macau, Macau, China* **(*Nanjing Ballroom 1*)**	
9:10-9:40	**Plenary Talk:** Ultrasonic Diagnostics Across Infrastructure, Microstructures, and Energy Systems Zheng Fan *Nanyang Technological University, Singapore* **(*Nanjing Ballroom 1*)**	
9:40-9:55	**Coffee Break**	
9:55-11:55	**Session 1:** Acoustic Horizons: Theory & Applications **(*Nanjing Ballroom 1*)**	
12:00-13:00	**Poster Session (*Pre-function Room*)**	
12:00-13:30	**Lunch Buffet (*Café Xuan*)**	
13:30-15:25	**Session 2-1:** Underwater Acoustics **(*Nanjing Ballroom 1*)**	**Session 3:** Acoustic Bioeffects **(*Nanjing Ballroom 2*)**
15:25-15:40	**Coffee Break**	
15:40-18:20	**Session 2-2:** Underwater Acoustics **(*Nanjing Ballroom 1*)**	**Session 4:** Metamaterials **(*Nanjing Ballroom 2*)**
18:30-20:30	**Banquet**	

Condensed Program

Wednesday, July 2nd

8:30-18:00	**Registration**	
8:00-8:30	**Plenary Talk:** Non-invasive focused power ultrasound therapy targeting inferior perirenal adipose tissue for drug naive hypertension: a randomized, sham-controlled, proof-of-concept trial (PARADISE-HTN-II) Xiangqing Kong *The First Affiliated Hospital of Nanjing Medical University, China* **(*Nanjing Ballroom 1*)**	
8:30-9:40	**Session 5-1:** General Nonlinear Acoustics **(*Nanjing Ballroom 1*)**	**Session 6-1:** Ultrasonic Imaging and Therapy **(*Nanjing Ballroom 2*)**
9:40-9:55	**Coffee Break**	
9:55-11:55	**Session 5-2:** General Nonlinear Acoustics **(*Nanjing Ballroom 1*)**	**Session 6-2:** Ultrasonic Imaging and Therapy **(*Nanjing Ballroom 2*)**
12:00-13:30	**Lunch Buffet (*Café Xuan*)**	
13:30-14:00	**Plenary Talk:** Ultrasound-Driven Innovations in Sustainable Chemistry and Precision Medicine Ivan Smirnov, Mohan Zhang, James Kwan *University of Oxford, UK* **(*Nanjing Ballroom 1*)**	
14:00-15:40	**Session 7:** Ultrasound Sonochemistry **(*Nanjing Ballroom 1*)**	**Session 8:** Acoustic Transducer **(*Nanjing Ballroom 2*)**
15:40-15:55	**Coffee Break**	
15:55-18:20	**Session 9:** Innovative Acoustic Technology Transformation **(*Nanjing Ballroom 1*)**	**Session 10:** Ultrasonics Nondestructive Testing **(*Nanjing Ballroom 2*)**

Condensed Program

Thursday, July 3rd

8:30-18:00	**Registration**
8:00-8:30	**Plenary Talk:** Visualized intelligent ultrasound thrombolysis Dong Zhang *Nanjing University, China* **(*Nanjing Ballroom 1*)**
8:30-9:40	**Session 11-1:** Acoustic Metrology **(*Nanjing Ballroom 1*)**
9:40-10:10	**Coffee Break**
10:10-11:40	**Session 11-2:** Acoustic Metrology **(*Nanjing Ballroom 1*)**
12:00-13:30	**Lunch Buffet (*Café Xuan*)**
13:30-14:00	**Plenary Talk:** Aeroacoustics as Particle Displacement Benefits and Challenges for Computational Acoustics Marcus Maeder *Technical University of Munich, Germany* **(*Nanjing Ballroom 1*)**
14:00-15:40	**Session 12:** Audio and Environmental Acoustics **(*Nanjing Ballroom 1*)** | **Session 13:** High Intensity Focused Ultrasound **(*Nanjing Ballroom 2*)**
15:40-15:55	**Coffee Break**
15:55-18:20	**Session 14:** Industrial and Power Ultrasound **(*Nanjing Ballroom 1*)** | **Session 15:** Computational Acoustics **(*Nanjing Ballroom 2*)**
18:30-20:00	**Board Meeting**

Condensed Program

Friday, July 4th

8:00-9:40	**Session 16-1:** Acoustic Microfluidics **(*Nanjing Ballroom 1*)**
9:40-9:55	**Coffee Break**
9:55-11:40	**Session 16-2:** Acoustic Microfluidics **(*Nanjing Ballroom 1*)**
11:40-12:00	**Closing Ceremony** **(*Nanjing Ballroom 1*)**
12:00-14:00	**Lunch Buffet (*Café Xuan*)**

Short Course Lecture 1

Nonlinear acoustics of fluids

Oleg A. Sapozhnikov

Moscow State University, Russia

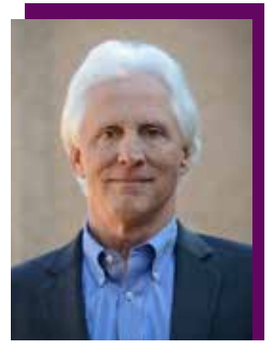
9:00-10:00 Monday June 30th, Nanjing Ballroom 1

The lecture presents the fundamentals of nonlinear acoustics of fluids. The subject of nonlinear acoustics is considered from the point of view of the dynamics of various perturbation modes. The basic equations are given, and the features of nonlinear effects in the presence of shock fronts are discussed.

Oleg A. Sapozhnikov received the M.S. degree in physics and the Ph.D. and D.Sc. degrees in acoustics from Moscow State University (MSU), Moscow, Russia. He is currently a Professor with the Department of Acoustics, Physics Faculty, MSU. For more than twenty years, he has also been with the Applied Physics Laboratory, Center for Industrial and Medical Ultrasound, University of Washington, Seattle, USA. His research interests are physical acoustics, nonlinear wave phenomena, and medical ultrasound, including shock wave lithotripsy, high-intensity focused ultrasound, and ultrasound-based imaging. He has been a member of the International Committee of the International Symposia on Nonlinear Acoustics, a member of the Board of the International Congress on Ultrasonics, a member of the Board of the Russian Acoustical Society, and a Fellow of the Acoustical Society of America.

Short Course Lecture 2

Nonlinear acoustics of solids



Mark F. Hamilton

University of Texas at Austin, USA

10:30-11:30 Monday June 30th, Nanjing Ballroom 1

This lecture presents fundamentals of nonlinear acoustics of solids, expanding on Part I for fluids. Topics include nonlinear compressional and shear waves and their interactions, strain energy densities, shear wave polarizations, shear wave beam diffraction for quadratic and cubic nonlinearity, surface waves, anisotropy, and slow dynamics in granular media.

Mark F. Hamilton received his B.S. in Electrical Engineering from Columbia University, his M.S. and Ph.D. in Acoustics from Penn State, and performed postdoctoral research in the Department of Mathematics at University of Bergen in Norway. He is currently Professor of Mechanical Engineering at University of Texas at Austin. He conducts research in physical acoustics, particularly nonlinear acoustics, often with biomedical applications. His research areas have included nonlinear sound beams, nonlinear waveguide interactions, radiation force and acoustic streaming, and nonlinear interface and shear waves in solids. His administrative positions have included Secretary General of the International Organizing Committee for the International Symposia on Nonlinear Acoustics (ISNA), and President of the Acoustical Society of America (ASA) and the International Commission for Acoustics (ICA). He was recently awarded the ASA Gold Medal.

Short Course Lecture 3

Visualization of acoustic field with applications in identifying noise sources

Weikang Jiang

Shanghai Jiaotong University, China

14:00-15:00 Monday June 30th, Nanjing Ballroom 1

The course focuses on microphone array measurement based visualization of acoustic field, which is very helpful to identify the positions and intensities of acoustical sources. Microphone array based visualization of sound field includes mainly near field acoustical holography(NAH) and beam forming(BF). In the course, the foundation theories, methodologies and technology of NAH and BF are introduced respectively, and some cases in engineering are presented to show abilities of NAH/BF in application. Because the conventional NAH/BF are effective mainly for steady stationary monopole sources in free fields usually, some progresses for sources with various features such as movement, multipole, nonstationary, in environment with strong disturbing, are developed for identifying noise sources of trains, fans, engines, etc. in engineering.

Dr. Weikang Jiang is a Distinguished Professor at Shanghai Jiao Tong University (SJTU) and serves as the Director of the Computational Acoustics Branch of the China Acoustical Society (CAS). He has held key academic leadership roles, including Fellow of CAS, Director of the Institute of Vibration, Shock and Noise at SJTU, Deputy Director of the State Key Laboratory of Mechanical Systems and Vibration (SJTU), and Chair of the Noise and Vibration Control Committee of the China Society of Vibration Engineering. Dr. Jiang's research expertise lies in acoustic field visualization, high-performance computational acoustics, and noise/vibration reduction. He has led seven national-level projects funded by the National Natural Science Foundation of China (NSFC), including 2 key projects. He authored over 120 SCI-indexed papers in top journals such as JSV, JASA, MSSP, APA. His contributions have been recognized with awards such as the First Prize of Shanghai Science and Technology Invention (2020) and three other ministerial-level technology awards.

Dr. Jiang's website is http://wkjiang.sjtu.edu.cn/EnglishWeb

Short Course Lecture 4

Parametric loudspeaker: Theory, advancement, and applications

Jun Yang

Institute of Acoustics, Chinese Academy of Sciences, China

15:30-16:30 Monday June 30th, Nanjing Ballroom 1

Dr. Jun Yang is the Distinguished Professor of Chinese Academy of Sciences (CAS) and the Deputy Director of Institute of Acoustics, Chinese Academy of Sciences (IACAS). He is also the Vice Dean of School of Electronic, Electrical and Communication Engineering, University of Chinese Academy of Sciences (UCAS). Dr. Jun Yang obtained the Ph.D. degree in acoustics from Nanjing University, China in 1996. From 1996 to 1998, he was a Postdoctoral Fellow of IACAS, China. From 1998 to 1999, he was with Hong Kong Polytechnic University, as Visiting Scholar. From 1997 to 1999, he was with IACAS, as an Associate Professor. He joined the School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), as a Research Fellow, a Teaching Fellow, an Assistant Professor, and an Associate Professor, in 1999, 2001, 2003, and 2005, respectively. Since 2003, he has been a Professor with IACAS. From 2011 to 2020, he was the Director of the Key Laboratory of Noise and Vibration Research, IACAS.

Dr. Jun Yang has contributed significantly to acoustics research and education. He has completed over 50 projects for industries and the government, and was granted over US$50 million R&D funds. He has published over 600 journal and proceeding papers, and has been granted more than 100 patents. He won the IES Prestigious Engineering Achievement Award in 2001, Gold Award in Technology Exhibition at NTU for developing Audio Beam Loudspeaker" in 2004, Excellent Paper Award for 5 times, and the Award of Excellence in the final evaluation of CAS Hundred Talents Program in 2008. Recently, he obtained the Pollyanna Chu Outstanding Teacher Prize in 2014 and 2020 respectively, Excellent Scientist Award by the Chinese Institute of Electronics in 2015, Excellent Graduate Advisor Award by CAS in 2016, the title of State Council Expert for Special Allowance" in 2018, the second prize of Beijing Science and Technology Progress Award in 2020, and the Outstanding Contribution Award in Audio Engineering by the Acoustical Society of China in2023.

Dr. Jun Yang is a Fellow of the Acoustical Society of China (ASC), Chinese Institute of Electronics (CIE), International Institute of Acoustics and Vibration (IIAV), a Senior member of the Institute of Electrical and Electronics Engineers (IEEE), the Section Director for China of IIAV, and the Vice President of the International Institute of Noise Control Engineering (I - INCE). He is an Executive Director of ASC, and chairs the Audio Engineering Society of China (AESC). He serves as the Editor - in - Chief of the Sound & Vibration journal.

Short Course Lecture 5

Ultrasound Brain–Machine Interface: Principles, Technologies, and Emerging Applications

Dawei Wu

Nanjing University of Aeronautics and Astronautics, China

16:30-17:30 Monday June 30th, Nanjing Ballroom 1

This short course introduces the cutting-edge field of Ultrasound Brain–Machine Interface (US–BMI), which integrates biomedical acoustics, neurovascular physiology, and ultrasound-enabled signal decoding to build noninvasive links between the brain and external devices. The course begins by outlining the current landscape of brain–machine interface research and development, and highlights how ultrasound provides unique advantages over traditional EEG, fMRI, and optical imaging modalities. Key enabling technologies for US–BMI will be presented, including ultrasound transducer arrays, transcranial ultrasound techniques, microvascular ultrasound imaging, and ultrasound-based neural signal decoding. Application Scenarios of Ultrasound Brain–Machine Interfaces which inculde monitoring,replacement,rehabilitation and augmentation will also be discussed. Finally, the course addresses challenges and the pathway toward clinical and translational deployment of US-BMI.Attendees will gain a comprehensive understanding of the theory, implementation, and application of US–BMI, with insights valuable for both research and translational purposes.

Dr. Dawei Wu is a Professor at the State Key Laboratory of Mechanics and Control of Mechanical Structures, and the Director of the Institute of Precision Drive and Control at Nanjing University of Aeronautics and Astronautics. He earned his Ph.D. in Biomedical Engineering from the University of Southern California, USA. Previously, he was a senior research scientist at Crown Research Institutes in New Zealand.Dr. Wu's research interests include ultrasound transducers and their applications in precision diagnosis and treatment of cardiovascular and neurological diseases. He has published over 100 scientific papers.He was selected for China's National High-Level Talent Program and Jiangsu Distinguished Professor Program, and he is a Distinguished Young Scholar of the Chinese Academy of Engineering.

Plenary Lecture 1

Magnetic Microrobots for Precision Biomedical Applications

Qingsong Xu

University of Macau, China

8:40-9:10 Tuesday July 1st, Nanjing Ballroom 1

Traditional biomedical micromanipulation is implemented by rigid microinjectors and micromanipulators to operate biological samples. New technologies and tools are necessary for better manipulating soft biological targets by reducing damage. Magnetic microrobots driven by magnetic fields provide a promising solution. However, applying such tiny microrobots to realize dexterous manipulation tasks is challenging. This presentation will report on our recent development of magnetic microrobots for precision biomedical applications. It ranges from magnetic soft catheter robots for vascular intervention, untethered magnetic microrobots for precision therapy, and tentacle-like microrobot swarms with large force output for biomedical micromanipulation. These magnetic microrobotic systems will enable efficient and safe biomedical applications to enhance human health via precision medical treatment. The challenging problems will be addressed, and future work will be discussed.

Dr. Qingsong Xu is a Professor at the Department of Electromechanical Engineering, Faculty of Science and Technology, University of Macau, and Director of the Smart and Micro/Nano Systems Laboratory. His research involves intelligent micro/nanosystems, precision robotics, and biomedical applications. He has published four books and over 450 papers in international journals and conferences, cited over 14000 times in Google Scholar with an H-index of 70. He currently serves as an Associate Editor of IEEE Transactions on Robotics (T-RO). He was a Technical Editor of IEEE/ASME Transactions on Mechatronics (T-MECH) and an Associate Editor of IEEE Transactions on Automation Science and Engineering (T-ASE) and IEEE Robotics and Automation Letters (RA-L). Prof. Xu has received more than ten best paper awards from international conferences and multiple times of Macao Science and Technology Awards from Macao SAR, China. He has been selected into the top 2% of the world's top scientists released by Stanford University since 2019. He is a Fellow of IEEE, ASME, and AAIA.

Plenary Lecture 2

Ultrasonic Diagnostics Across Infrastructure, Microstructures, and Energy Systems

Zheng Fan

Nanyang Technological University, Singapore

9:10-9:40 Tuesday July 1st, Nanjing Ballroom 1

Ultrasound stands at the forefront of modern diagnostics, offering a unique ability to interrogate the internal state of materials by capturing subtle changes in wave propagation induced by microstructural and mechanical features. Through shifts in speed, amplitude, and frequency, ultrasonic waves reveal deep insights into the condition, composition, and integrity of complex materials. This makes them indispensable for non-destructive evaluation across a spectrum of critical applications. In structural systems such as reinforced concrete, early-stage degradation often escapes visual detection. Advanced ultrasonic techniques, including coda wave interferometry and Rayleigh wave spectroscopy, are deployed to detect microcracks and changes in acoustic impedance caused by corrosion. These methods provide enhanced sensitivity for infrastructure monitoring, enabling intervention long before visible damage appears. At the material scale, ultrasound serves as a window into microstructural characteristics. Polycrystalline media, influenced by grain size, morphology, and crystallographic texture, affect ultrasonic responses in measurable ways. By decoding these responses, we can assess the internal structure of materials produced by processes like additive manufacturing, where conventional inspection tools are often inadequate. In the energy sector, we extend ultrasonic techniques to the inspection of electric vehicle battery cells. Acoustic signals are used to monitor internal temperatures, assess the state of health, and estimate the state of charge, all without compromising the sealed structure of the battery. This enables real-time, non-invasive diagnostics that improve both safety and performance. These advances demonstrate the versatility and power of ultrasound in tackling some of the most demanding challenges in materials engineering. From civil infrastructure and advanced manufacturing to energy storage, ultrasonic inspection is redefining how we evaluate, understand, and safeguard complex systems.

Dr. Zheng Fan is an associate professor in the School of Mechanical and Aerospace Engineering at Nanyang Technological University, Singapore. He earned his Ph.D. degree in Mechanical Engineering from Imperial College London in 2010, and his Bachelor's and Master's degrees in Acoustics from Nanjing University in 2004 and 2006, respectively. Currently, he leads a research team dedicated to developing novel techniques for the non-destructive evaluation, structural health monitoring, and sound manipulation. His work integrates advanced physics and modeling techniques with the development of technologies that can be rapidly deployed in practical settings. Dr. Fan maintains strong links with the global industry, collaborating with major companies such as Rolls-Royce, Shell, Lloyd's Register, EDF, and Sembcorp, etc. His research spans from thorough investigations of fundamental theories to the application of science in addressing real-world challenges. The results of his work have been published in over 90 papers in top tier journals. He holds two international patents and has successfully licensed these technologies to industry partners. In 2018, Dr. Fan was awarded the Achenbach Medal for his outstanding contributions to structural health monitoring. Since 2020, he has been ranked among the world's top 2% of scientists by Stanford University. Dr. Fan also serves as an Associate Editor for "Structural Health Monitoring – An International Journal" and "Ultrasonics," two leading journals in his field.

Plenary Lecture 3

Non-invasive focused power ultrasound therapy targeting inferior perirenal adipose tissue for drug naive hypertension: a randomized, sham-controlled, proof-of-concept trial (PARADISE-HTN-II)

Xiangqing Kong

The First Affiliated Hospital of Nanjing Medical University, China

8:00-8:30 Wednesday July 2nd, Nanjing Ballroom 1

Renal denervation therapy has confirmed the efficacy and safety of targeting sympathetic nerves on hypertension. However, invasive manner of RDN limits its application in mild to moderate hypertensive patients. Perirenal adipose tissue (PRAT) is implicated in the maintenance of hypertension, and preclinical evidence suggests the sensory nerve signaling could serve as a therapy target. This trial aims to evaluate the efficacy and safety of a novel non-invasive therapy by focused power ultrasound mediated inferior perirenal adipose tissue modification (FPU-iPRATM) on blood pressure in drug naive hypertensive patients. This multicenter, blinded, randomized, sham controlled trial enrolled 79 drug-naive or participants(office systolic blood pressure [SBP] 140-159 mmHg, office diastolic blood pressure [DBP] < 100 mmHg, 24-h ambulatory SBP ≥130 mmHg) who have discontinued their drugs for at least 4 weeks from 4 Chinese centers. Participants received one-time FPU-iPRATM (n=39) or sham operation (n=40). The primary efficacy endpoint is the change in 24-h ambulatory SBP at 1-month, and the major secondary endpoints are changes in 24-h ambulatory SBP and DBP at 3-month. Safety events were assessed at 3 months. The results of PARADISE-HTN-II trial provide a proof of principle evidence for non-invasive blood pressure reduction by FPU-iPRATM therapy, with 3-month efficacy and safety.

Xiangqing Kong, MD, Chief physician, Professor, Doctoral supervisor, Director of the Department of Cardiovascular Medicine of the First Affiliated Hospital of Nanjing Medical University (Jiangsu Province Hospital).National tens of millions of talents, the winner of the first National Innovation Award and the national May 1st Labor Medal, Jiangsu Province 333 first-level talents. He is engaged in the cross-innovation of cardiovascular medical instruments and cardiovascular etiology research, and the initiator of eHypertension in a prospective primary hypertension cohort. He has presided over the national high-tech research and development project (863 Program), the national key research and development program, the national science and technology major project, the national major scientific research instrument development project, the national nature original exploration program, the national nature surface project (5) and more than 10 provincial and ministerial projects. He has published more than 400 research papers.

Plenary Lecture 4

Ultrasound-Driven Innovations in Sustainable Chemistry and Precision Medicine

James Kwan

University of Oxford, United Kindom

13:30-14:00 Wednesday July 2nd, Nanjing Ballroom 1

This talk presents the latest results from Prof. James Kwan's team at the University of Oxford's Physical Acoustics Laboratory and the Oxford Suzhou Centre of Advanced Research. It explores the physical, chemical, and biological effects of acoustic cavitation in chemical engineering and biomedical contexts. In sonochemistry, the team develops novel reactors and sonocatalysts to enhance reaction efficiencies for green hydrogen production, CO2 reduction, ammonia synthesis, and advanced oxidation processes. Innovations include nanostructured TiO2 sonophotocatalysts, gas-stabilizing gold nanocones (gs-AuNCs), and pulsed ultrasound reactors for intensified radical generation, achieving unprecedented energy efficiency and reduced environmental impact. In ultrasound-enhanced therapies, cavitation-nucleating drug carriers are designed for precise, sustained treatment of diseases such as atherosclerosis. Sound-sensitive poly(lactic-co-glycolic acid) microparticles (mcPLGA MPs) enable HIFU-guided implantation and controlled drug release, reducing inflammation while providing real-time imaging feedback. The findings underscore the efficacy of shape-morphology-optimized microparticles in enhancing cavitation response, enabling targeted, prolonged therapeutic action and imaging contrast in models of arterial inflammation.

Together, these studies demonstrate the transformative potential of ultrasound-based technologies across disciplines, offering energy-efficient, and noninvasive strategies for chemical synthesis, environmental remediation, and precision medicine. The team's integrated approach paves the way for next-generation sonochemical and sonotherapeutic platforms with broad industrial and clinical relevance.

James Kwan is an Associate Professor at the Department of Engineering Science at the University of Oxford and a Tutorial Fellow at Balliol College. He is part of the Physical Acoustics Lab (PacLab) and a PI in OSCAR. His research interests include the application of mechanical, thermal, and chemical effects of ultrasound and cavitation to address challenges in personal and environmental health. He was awarded the W.W. Spooner Junior Research Fellowship at the University of Oxford for his work in ultrasound-based strategies for drug delivery. From 2016 to 2020, James was an Assistant Professor at the School of Chemical and Biomedical Engineering at Nanyang Technological University Singapore (SCBE). James' work to date on ultrasound and cavitation has resulted in invited presentations and lectures around the world, peer-reviewed journal articles in prestigious journals such as Ultrasonics Sonochemistry, Journal of Controlled Release, Small, and Theranostics, and co-authored book chapters. He is also part of the Editorial Board of Ultrasonics Sonochemistry. Additionally, he has applied for numerous patents, two of which have been awarded and are now licensed to separate spinout companies in the USA and UK.

2025 International Symposium on Nonlinear Acoustics
2025国际非线性声学大会

Plenary Lecture 5

Visualized intelligent ultrasound thrombolysis

Dong Zhang

Nanjing University, China

8:00-8:30 Thursday July 3rd, Nanjing Ballroom 1

Thrombotic diseases have increasingly become a major global health issue, surpassing malignant tumors and heart diseases to become the leading cause of death worldwide. Therefore, achieving safe and efficient thrombolytic therapy is one of the key scientific challenges in improving the efficacy of thrombotic disease treatment. In recent years, low-intensity ultrasound thrombolysis has exhibited great potential in the diagnosis and treatment of thrombotic diseases, while related mechanisms and optimized parameters remain unclear. Our research mainly focuses on the development of visualized ultrasound thrombolysis system. Upon this, intelligent image analysis can automatically identify thrombus characteristics, while ultrasonic RF signals enable real-time monitoring and evaluation of the spatiotemporal evolution of acoustic cavitation. Under multi-parameter conditions, machine learning is employed to assist in constructing optimized phased-array ultrasound thrombolysis emission strategy, which can be used to deeply investigate the synergistic mechanism of acoustic streaming and cavitation in promoting ultrasound thrombolysis, and eventually achieve safer and more controllable ultrasound thrombolysis.

Dr. Zhang Dong is currently the vice dean of the School of Physics, Nanjing University. His main research directions are medical ultrasound, nonlinear acoustics, and acoustic signal processing. He has been granted more than 10 key and general projects of the National Natural Science Foundation of China. He has published more than 200 peer-reviewed papers in journals such as Nat Materials, PR Applied, JASA, etc., and has obtained more than 30 authorized invention patents. In 2006, he was selected for the New Century Excellent Talents Plan of the Ministry of Education. In 2007, he won the second - prize of the Natural Science Award of the Ministry of Education. In 2016, he was approved as the leader of the Science and Technology Innovation Team of the Qinglan Project in Jiangsu Province, and won the first - prize of the Natural Science Award of the Ministry of Education. In 2017, he won the third - prize of Jiangsu Science and Technology Award. In 2018, he was selected into the 2nd-level Jiangsu 333 High level Talent Cultivation Project. In 2021, he became the leader of the Science and Technology Innovation Team of Jiangsu Higher Education Institutions. His currently also serves as the vice president of the Acoustical Society of China, member of the advisory committee of the International Conference on Nonlinear Acoustics, associate editor of Applied Acoustics abd Acta Acustica, editorial board member of Acoustical Physics, Technical Acoustics, Journal of Clinical Medical Ultrasound, as well as Chinese Journal of Medical Imaging, etc.

Plenary Lecture 6

Aeroacoustics as Particle Displacement
Benefits and Challenges for Computational Acoustics

Marcus Maeder

Technical University of Munich, Germany

13:30-14:00 Thursday July 3rd, Nanjing Ballroom 1

The field of aeroacoustics has seen a vast development regarding various descriptions and methodologies as part of computational acoustics since the ground-breaking developments of Lighthill in the 1950s. Common strategies to describe wave generation and propagation in moving fluids utilize an Eulerian frame with the well-known acoustic quantities such as the fluid density, velocity, and pressure fluctuations, together with suitable numerical schemes. Despite the ongoing development in computational power, industrial applications such as the sound radiation of airplanes result in enormous models, even with a truncated exterior domain. The situation becomes even more complex if the coupling to structural vibration must be considered, since appropriate boundary and initial conditions are necessary. In the 1930s, a French scientist named Galbrun developed a displacement-based formulation of the acoustic wave propagation in moving fluids, which is still rather unknown in the aeroacoustic community. However, by using a Lagrangian particle displacement as the generalized unknown, the overall size of the models decreases significantly while simplifying coupling conditions. This talk reviews Galbrun's equation, along with benefits and challenges for computational acoustics, placing a significant focus on boundary and coupling conditions for multiphysical investigations. This way, coupled problems of aeroacoustics and hydroacoustics, including elastic structures, can be solved efficiently, making complex problems easier to access using computational acoustics.

Dr. Maeder is a fully employed Research Associate at the chair of Vibroacoustics of Vehicles and Machines at the TUM School of Engineering and Design at the Technical University of Munich (TUM), Germany, from which he also received his doctoral degree in Engineering Mechanics with his work "Sound and vibration in a mixed frame - Applications in aeroacoustics and rotor dynamics". Doctor Maeder is the author and co-author of numerous peer-reviewed journal articles, a book chapter, a patent, and over 50 conference contributions on various research topics in numerical and experimental vibroacoustics. Specifically, this includes applications in the automotive and aerospace sectors, civil engineering, medical equipment, and material property identification of monolithic and carbon composite structures. His research is based on the pillars of fundamental theory, numerical methods, experiments, and data-driven approaches to understand wave propagation in solids and fluids and their interaction. In addition to his research, Dr. Maeder is teaching courses in "Machine Learning" and "Experimental Vibroacoustics" at TUM and was a guest lecturer for "Noise, Vibration, and Harshness" at Tongji University, Shanghai, China. Besides his commitment as a reviewer for various international journals, Marcus Maeder is an Associated Editor for Numerical and Computational Acoustics for Acta Acustica and the current chair of the Technical Committee on Computational Acoustics within the European Acoustics Association.

List of Oral Presentations

Tuesday, July 1st, 2025-Session 1: Acoustic Horizons: Theory & Applications

Chair Persons: Dong Zhang, Yu Zhang

9:55-10:15 **Perturbation solution for second-harmonic generation in focused shear wave beams in soft solids (Invited Talk)**
Philip G. Kaufinger, John M. Cormack, Kyle S. Spratt, Mark F. Hamilton

10:15-10:35 **Ultrasound Neuromodulation and Sonogenetics (Invited Talk)**
Quanxiang Xian, Lei Sun

10:35-10:55 **Low-Intensity Ultrasound Coupled with Sonosensitizers for Environmental Applications: Attempts and Trends in Sonochemistry within Nonlinear Acoustics (Invited Talk)**
Xiaoge Wu

10:55-11:15 **Quasi-static component generation of ultrasonic guided waves and its application for lithium-ion battery state of charge and cathode evolution (Invited Talk)**
Xiaolei Lin, Xiaofeng Li, Mingxi Deng, Weibin Li

11:15-11:35 **Ultrasound laser induced breakdown spectroscopy for chemical analysis of sea water (Invited Talk)**
Alexey V Bulanov

11:35-11:55 **Portable Ultrafast Super-resolution Imaging Platform for Medical Ultrasound Applications (Invited Talk)**
Juan Tu

Tuesday, July 1st, 2025-Session 2: Underwater Acoustics
Chair Person: Gang Qiao

13:30-13:50 **Research on cross-medium communication mechanisms combining acoustic and electromagnetic waves (Invited Talk)**
Fengzhong Qu

13:50-14:10 **Nonlinear Underwater Acoustic Phenomena: Mechanisms for Advanced Sound Field Manipulation (Invited Talk)**
Jie Shi

14:10-14:25 **Research on the Influence of Ocean Waveguide Interfaces on the Distribution Characteristics of Difference Frequency Sound Field**
Yuan Cao, Desen Yang, Haokang Shi, Jie Shi, Haoyang Zhang

14:25-14:40 **Research on nonlinear Acoustic Detection of Submarine Pipelines Based on 3D Height Field Modeling**
Peng-yue Wang, Jian-jun Zhu, Pei-hong Wang, Guo-qing Zhao

14:40-14:55 **Study on the Influencing Factors of Underwater Acoustic Three-Wave Mixing**
Huanran Yang, Jiangyi Zhang, Haoyang Zhang, Song Li, Desen Yang

14:55-15:10 **Mode Control of Nonlinear Acoustic Field in Shallow Sea Waveguide**
Haokang Shi, Desen Yang, Yuan Cao, Jie Shi, Haoyang Zhang

15:10-15:25 **Virtual Sensing-Based Active Noise Control Algorithm for Narrowband Underwater Noise Using Underwater Parametric Acoustic Array**
Bo Fan, Jie Shi, Haokang Shi

15:40-15:55 **Low-Frequency Radiated Sound Field Prediction of Structural Acoustic Sources via Sparse Bayesian Learning Equivalent Source Method**
Hu Cheng, Jie Shi, De-sen Yang

15:55-16:10 **A Novel Path Planning Method for Underwater Target Search Incorporating Acoustic Parameters**
Siyuan Liao, Wenbin Xiao, Yongxian Wang, Zhao Sun and Wenfeng Liu

16:10-16:25 **Key Technologies of Underwater Passive Acoustic Monitoring and Applications in Cetacean Bioacoustics Research**
Lei Li, Gang Qiao, Songzuo Liu, Qian Wang, and Xuerong Cui

16:25-16:40 **The hydrodynamic noise from oscillating capsules**
Wenda Di, Zhongrui Zhu, Desen Yang

16:40-16:55 **The VANC Nonlinear Filtering Algorithm Based on Acoustic-Vibrational Cooperative Sensing**
Yuhang Li，Guocheng Gao

16:55-17:10 **The efficiency of nonlinear acoustic interaction and the parameter of nonlinearity of a liquid with gas and vapor-gas bubbles**
Vladimir A. Bulanov

17:10-17:25 **Performance Evaluation of High-Order Vector Hydrophones: Directional Gain and Signal Amplitude Attenuation in Practical Applications**
Zi Yang, Erzheng Fang

17:25-17:40 **A Docker-Based Integrated Central Computing Architecture for Multi-Tasks of UUV**
Yuanyuan Tan, Erzheng Fang, Feisu Shen

Tuesday, July 1st, 2025-Session 3: Acoustic Bioeffects
Chair Persons: Juan Tu, Xiaozhou Liu

13:30-13:50 **Speckle Dynamic Analysis-based Ultrasound Velocimetry for Carotid Artery imaging (Invited Talk)**
Jianbo Tang

13:50-14:10 **LTP/LTD-like plasticity and therapeutic effects induced by transcranial ultrasound stimulation (Invited Talk)**
Junfeng Sun

14:10-14:25 **Research on Enhancing Transdermal Drug Delivery Based on Multi-Stage Dynamic Focusing**
Xinyue Gong, Honghui Xue, Juan Tu

14:25-14:40 **Multiphysics Modeling of Intravascular Acoustic Cavitation: Microbubble Behavior and Vascular Stress Response**
Chao Zhang, Xinxing Duan

14:40-14:55 **Low-Intensity Pulsed Ultrasound Restores Pancreatic β-Cell Function and Systemic Glucose Homeostasis via Mitochondrial Energetic Reprogramming in Type 2 Diabetic Mice**
Chen Ni, Chenghai Li, Faqi Li

14:55-15:10 **Numerical Study of Ultrasound-Driven Focusing and Transdermal Transport of Drug Particles Using a Coupled LBM–IBM–PD Model**
Yu Yang, Minglei Shan, Juan Tu

15:10-15:25 **A Novel Fresnel Acoustic Metastructure Coupling Material for Focusing Enhancement during Transcranial Ultrasonic Therapy**
Zijun Liu，Juan Tu

Tuesday, July 1st, 2025-Session 4: Metamaterials
Chair Person: Xuefeng Zhu

15:40-16:00 **Seven-octave ultrabroadband metamaterial absorbers (Invited Talk)**
Yong Li

16:00-16:20 **Bubble acoustic metamaterials (Invited Talk)**
Zhandong Huang

16:20-16:35 **Maximum helical dichroism enabled by an exceptional point in non-Hermitian gradient metasurfaces**
Xiao Li, Chuanjie Hu, Yangyang Fu

16:35-16:50 **A Low-Frequency Broadband Short-Channel Sound Absorber with Dual-Mode Tunable Elastic Walls**
Ting Li, Fengmin Wu, Junjun Wang, Dong Zhang

16:50-17:05 **Encapsulated bubbles as stable sound transmission metamaterials and maximum sound transmission through a damped bubble layer**
Keke Wang

17:05-17:20 **Construction of bubble-like acoustic metamaterials and acoustic regulation in water**
Yating Wen

17:20-17:35 **Efficient acoustic energy harvesting underwater via the phase reversal Fresnel zone plate**
Zi-Bin Lin, Ji-Zhen Liu, Yu-Gui Peng, Xue-Feng Zhu

17:35-17:50 **Analysis of Lamb Wave Propagation in Highly Anisotropic Composite Plates via Fibre-optic interference and Coordinate Transformation**
Weiwei Kan

17:50-18:05 **Z-Classified Topological Phases and Bound States in the Continuum Induced by Multiple Orbitals**
Shi-Feng Li, Wen-Jie Yang, Cui-Yu-Yang Zhou, Yi-Fan Zhu, Xin-Ye Zou and Jian-Chun Cheng, Badreddine Assouar

18:05-18:20 **Super-resolution acoustic displacement metrology through topological pairs in orbital meta-atoms**
Yangyang Fu, Xiao Li, and Changdong Chen

Wednesday, July 2nd, 2025-Session 5: General Nonlinear Acoustics
Chair Persons: Qingyu Ma, Gepu Guo, Mark Hamilton, Oleg Sapozhnikov

8:30-8:50 **Acoustics Meets Cell Culture: In Vitro Strategies for Bioengineering (Invited Talk)**
Chikahiro Imashiro

8:50-9:10 **Single-beam acoustical tweezers (Invited Talk)**
Zhixiong Gong

9:10-9:25 **Assessment of homogenizing material properties of scatterers to facilitate calculation of acoustic radiation force**
Cassidy A. Christie, Thomas S. Jerome, Mark F. Hamilton

9:25-9:40 **High-intensity focused ultrasound array in air**
Oleg A. Sapozhnikov, Shamil A. Asfandiyarov, Anastasiya V. Lapina, Sergey A. Tsysar

9:55-10:10 **Numerical modeling of difference-frequency wave generation in the three-dimensional field of a dual-frequency parametric array**
Petr V. Yuldashev, Anastasia V. Kvashennikova, Igor B. Esipov, Maria S. Sergeeva, Vera A. Khokhlova

10:10-10:25 **Numerical analysis of weakly nonlinear acoustic wave propagation in felted material**
Maria M. Vuin, Dmitri Kartofelev

10:25-10:40 **Reconfigurable Ultra-Deep Subwavelength Acoustic Field Control with Oscillating Microbubble Array Metamaterials (OMAMs)**
Xinjia Li, Long Meng

10:40-10:55 **Real-time treatment efficacy monitoring for dual-frequency nonlinear HIFU therapy based on parametric array effect**
Zhengrong Zhu, Jingwen Yu, Gepu Guo, Qingyu Ma

10:55-11:10 **Evaluation of stress states in prestressed steel bars: A comparison between resonance-based and acoustoelastic methods**
Ronghua Xu, Raúl Enrique Beltrán Gutiérrez, Marx Steffen

11:10-11:25 **Pulse Propagation in Felt and Its Dependence on Relaxation Time**
Dmitri Kartofelev, Maria M. Vuin

11:25-11:40 **Nonlinear acoustic wave responses of hyperelastic curved structures subject to dynamic loads**
Fangtao Xie, Yegao Qu

11:40-11:55 **Underwater acoustic metamaterials**
He Gao

Wednesday, July 2nd, 2025-Session 6: Ultrasonic Imaging and Therapy
Chair Person: Dingjie Suo

8:30-8:50 **Musculoskeletal ultrasound computed tomography based on full waveform inversion (Invited Talk)**
Yubing Li, Panpan Li, Chang Su, Weijun Lin

8:50-9:10 **Reversible Ca2+ signaling and enhanced paracellular transport in endothelial monolayer induced by acoustic bubbles and targeted microbeads (Invited Talk)**
Jiawei Lin, Chaofeng Qiao, Hao Jiang, Zhihui Liu, Yaxin Hu, Wei Liu, Yu Yong, Fenfang Li

9:10-9:25 **A 128-channel ultrasound imaging platform for blood perfusion**
Zhang Xi, Jianguo Ma

9:25-9:40 **Enhanced blood-brain barrier opening induced by focused ultrasound combined with microbubble clusters trapped by an acoustic vortex tweezer**
Shifang Guo, Wanlin Jia, Xinru Hu, Yan Li, Zhen Ya, Chaoyu Wang, Pengfei Xu, Diya Wang, and Mingxi Wan

9:55-10:10 **Acoustic Hologram-enabled Simultaneous Multi-Target Blood-Brain Barrier Opening (AH-SiMBO)**
Bingbing Cheng, Xinya Yao, Xiangkun Piao, Jia-Ji Pan

10:10-10:25 **Research on Dual-Focused Ultrasonic Transducers with a Short Focal Length**
Xiao Zhang, Zhuochen Wang

10:25-10:40 **Airy-beam holographic sonogenetics for advancing neuromodulation precision and flexibility**
Zhongtao Hu

10:40-10:55 **Development of PMUTs with broaden bandwidth and improved sensitivity towards in vivo imaging**
Wanli Yang, Xingli Xu, Xiaofan Hu, Xiaohua Jian, Qinglin Sun, Pengfei Niu and Zhuochen Wang

10:55-11:10 **Characterization of nonlinear focused ultrasound transducers and fields employed in modern therapeutic applications such as boiling histotripsy**
Sergey A. Tsysar, Ekaterina M. Ponomarchuk, Petr V. Yuldashev, Oleg A. Sapozhnikov, Vera A. Khokhlova

11:10-11:25 **Autocorrelation-Based Shear Wave Viscoelastic Imaging by Harmonic Multifrequency Vibration**
LiJuan Wang, Zhaoxun Wang, Xiongtao Xiao, MingXi Wan, HongMei Zhang

11:25-11:40 **3D Echocardiography with High Spatiotemporal Resolution via Motion Compensation and Clutter Filtering**
Xiaoke Zhang, Xipeng Chen, Pengfei Xu, Diya Wang

Wednesday, July 2nd, 2025-Session 7: Ultrasound Sonochemistry
Chair Persons: Xiaoge Wu, Yang Tao

14:00-14:20 **Scaling Law of Ultrasonic Bubbling at the Air-Liquid Interfaces Toward Solid-Free Air Purification (Invited Talk)**
Xiuxing Tang, and Duyang Zang

14:20-14:40 **Ultrasound Food Processing: Sono-physical and sono-chemical perspectives (Invited Talk)**
Yang Tao, Yue Wu, Dandan Li, Yongbin Han

14:40-14:55 **Applications of the numerical simulation on the ultrasound processing of plant-based proteins**
Yue Wu

14:55-15:10 **Improved assessment sensitivity of time-varying cavitation events based on wavelet analysis**
Qi Zhang, Xiaoge Wu, Dong Zhang, Juan Tu

15:10-15:25 **Investigation of ultrasound propagation in fluids with PLGA microparticles**
Mohan Zhang, Ivan Smirnov, James Kwan

15:25-15:40 **Ultrasound-Driven Innovations in Sustainable Chemistry and Precision Medicine**
Ivan Smirnov, Mohan Zhang, James Kwan

Wednesday, July 2nd, 2025-Session 8: Acoustic Transducer
Chair Person: Dawei Wu

14:00-14:20 **Soft acoustic materials for wireless human-machine interface (Invited Talk)**
Jianfeng Zang

14:20-14:40 **MEMS Underwater Acoustic Sensors: Opportunities and Challenges (Invited Talk)**
Yongyao Chen

14:40-14:55 **Enhanced Controlled Drug Release Utilizing Millimeter-Scale Ultrasonic Transducer Technology**
Hanmin Peng

14:55-15:10 **The design and application of dual-modes micro multi-frequency ultrasonic transducer**
Weiwei Shao, Peiyang Li, Zhangjian Li, Xueru Yang, Xiangxin Li, and Yaoyao Cui

15:10-15:25 **High-performance transparent ultrasonic transducers for advanced photoacoustic imaging**
Zhiqiang Zhang, Chaorui Qiu, Zhiqiang Xu, Chengbo Liu, Weibao Qiu, Fei Li, Hairong Zheng

15:25-15:40 **Miniature Ultrasound Transducer for Guidance of Minimally Invasive Interventional Procedures**
Yue Yang, Jianguo Ma

Wednesday, July 2nd, 2025-Session 9: Innovative Acoustic Technology Transformation
Chair Persons: Kailiang Xu, Fang Yang

15:55-16:15 **Unraveling Plasma Protein Corona by Ultrasonic Cavitation Augments Active-Transporting of Liposome in Solid Tumor (Invited Talk)**
Guowei Wang, and Pintong Huang

16:15-16:35 **Multi-dimensional Realtime Passive Cavitation Imaging (Invited Talk)**
Xiran Cai

16:35-16:50 **Advances in nonlinear ultrasonic guided waves: Intelligent characterization and phased array imaging**
Xuan Li, Lishuai Liu, Yanxun Xiang

16:50-17:05 **Comfortable Wearable-ultrasonic Patch for Noninvasive Monitoring of Blood Flow Vector Information**
Jianzhong Chen,Dawei Wu

17:05-17:20 **Nanobubbles based ultrasound imaging and therapy**
Fang Yang, Xiao Wang, Jian Tang, Mingxi Li

17:20-17:35 **Deep Learning Inversion with Prior Knowledge Integration for Cortical Bone Imaging**
Chenchen Zhou, Tao Jiang, Guoao Ma, Ying Li, Kailiang Xu, and Dean Ta

17:35-17:50 **Spinal cord injury imaging from acute to chronic phase using ultrasound localization microscopy**
Junjin Yu, Kailiang Xu

17:50-18:05 **Research on Multi-Parametric Functional Perfusion Imaging and Systems Based on Dynamic Contrast-Enhanced Ultrasound**
Diya Wang, Mingxi Wan

18:05-18:20 **Integrated Wearable Cardiac Ultrasound: Flexible Transducer Array and 64-channel Miniaturized System**
Zhongwen Cheng, Xuanrong Ji

Wednesday, July 2nd, 2025-Session 10: Ultrasonics Nondestructive Testing
Chair Persons: Xudong Yu, Zheng Fan

15:55-16:15 **Flexible Ultrasonic Transducers for Multiscale Structural Damage Detection (Invited Talk)**
Shifeng Guo

16:15-16:35 **Ultrasonic array imaging for defect detection in complex-shaped aerospace composite structures (Invited Talk)**
Xudong Yu

16:35-16:50 **A Magnetoelectric–Ultrasonic Multimodal System for Synchronous Evaluation of Surface and Internal Defects in Metals**
Jianglei Chang, Xiangyu Gao, Shuxiang Dong, Fei Li

16:50-17:05 **Ultrasonic Scanning System for Lithium-ion Battery Detection**
Xin-Ye Zou, Xin Li, Zeng-Xin Cai

17:05-17:20 **SAFE-PML approach for modal study of poroelastic guided waves in fluid-saturated porous waveguides**
Hao Zhou, Zijian Zhang, Peng Zuo, Ming Huang, Mingxi Deng, Xudong Yu

17:20-17:35 **An Improved Ultrasonic Phased Array ToFD Method for Defect Detection in Fan Disk IFW Joints**
Tingyu Luo, Yankai Li, Jiayi Geng, Xudong Yu

17:35-17:50 **Piezoelectric Ceramic Wafers Enable the Effective Excitation of High-frequency Primary Ultrasonic Guided Wave and Reception of Low-frequency Static Component in Pipes**
Xiang Wan, Shuaixiang Chen, Liping Huang , Xuhui Zhang ,Yuan Chen

Thursday, July 3rd, 2025-Session 11: Acoustic Metrology
Chair Persons: Ping Yang, Longbiao He, Feng Niu

8:30-8:50 **Zero group velocity Lamb wave stress measurement method based on multimodal fusion (Invited Talk)**
Jiaxin Li, Tianchen Sheng, Bo Zhao

8:50-9:10 **Research on Air-coupled Ultrasonic Transducers Based on Cellular Polypropylene Films (Invited Talk)**
Peng Xu, Haoliang Li, Jian Li, Zheng Hu, Xunlin Qiu, Yanxun Xiang

9:10-9:25 **Research on the Vibration Velocity Consistency Between Underwater Membrane and Acoustic Field**
Yiyu Wang, Guanghui Jia, Shiquan Wang

9:25-9:40 **Far-field Sonic Boom Prediction Based on Augmented Burgers Equation**
Huijie Yang, Guanwen Sun, Hanyin Cui, Weijun Lin

10:10-10:25 **Research on Three-Dimensional Vector Parameters Optimization Measurement Method for Vector Hydrophones**
Guanghui Jia, Boyue Wu, Yi Chen, Yaping Huang

10:25-10:40 **Research on Acoustic Power Measurement of Tubular Divergent Wave Ultrasonic Transducers Based on the Electrical-Self Reciprocity Principle**
Man Luo, Renjie Song, Liang Wang, Dan Song

10:40-10:55 **Research on the Traceability for Novel Diagnostic and Therapeutic Ultrasound**
Guangzhen Xing, Huanran Lu, Feiming Qian, Ke Wang, Ping Yang

10:55-11:10 **Low-frequency self-noise measurement from a fiber-optic hydrophone using the insensitive reference method in vacuum**
Liuqing Yang, Yi Chen

11:10-11:25 **Online Acoustic Power Measurement of Transducers Based on Surface Vibration**
Liang Wang, Man Luo

Thursday, July 3rd, 2025-Session 12: Audio and Environmental Acoustics
Chair Persons: Jing Lu, Jiaxin Zhong

14:00-14:20 **On the nonlinear distortion of a miniature speaker (Invited Talk)**
Bilong Liu

14:20-14:40 **Secondary Path Inversion in Multi-channel Active Noise Control Using Time Domain Neural Networks (Invited Talk)**
Qinxuan Xiang, Yijing Chu, Ming Wu, and Guangzheng Yu

14:40-14:55 **Deep learning based prediction of urban air mobility noise propagation in urban environment**
Younghoon Kim

14:55-15:10 **Nonlinear Acoustic Computing and Reinforcement Learning for Robust Human-Robot Audition in Challenging Environments**
Xiaoliang Chen, Xin Yu, Le Chang, Yunhe Huang, Jiashuai He, Shibo Zhang, Jin Li, Likai Lin, Ziyu Zeng, and Xianling Tu

15:10-15:25 **Online Laguerre Filter Pole Selection for Multichannel Noise Reduction in Time-domain**
Yanwen Li, Huawei Chen

15:25-15:40 **A Deep Learning Pre-Processing Method for Speech Restoration in Parametric ArrayLoudspeaker**
Wenyao Ma, Ming Wu, Jun Yang

Thursday, July 3rd, 2025-Session 13: High Intensity Focused Ultrasound
Chair Persons: Yufeng Zhou, Faqi Li

14:00-14:20 **Initial Clinical Evaluation of Microbubble-mediated Histotripsy for Hepatic Metastases (Invited Talk)**
Yonghua Xu

14:20-14:40 **Ultrasound Directly Activates Sparse Neurons and Modulates Visual Circuits (Invited Talk)**
Jiaru He, Zhihai Qiu

14:40-14:55 **Cross-corneal riboflavin drug delivery enhanced and regulated by pLIFU cavitation for keratoconus treatment: ex vivo study**
Qiao Wang, Youjia Sun, Yaojie Wu, Diya Wang

14:55-15:10 **Prediction of Submillimeter-Lesions in Superficial Focused Ultrasound Ablation: An Integrated Approach Combining Machine Learning with Computational Modeling**
Xinyao Wu, Chenghai Li, Faqi Li

15:10-15:25 **Non-invasive Transcranial Ultrasound Theranostic System for Ischemic Stroke Rats**
Shuang Yang, Yuanbo Yang, Yufeng Zhou

15:25-15:40 **Real-Time Passive Cavitation Mapping and B-Mode Fusion Imaging via hybrid adaptive beamformer with Modified Diagnostic Ultrasound Platform**
Bingze Du, Yifei Zhu, Qi Zhang, Bo Ding

Thursday, July 3rd, 2025-Session 14: Industrial and Power Ultrasound
Chair Person: Chenghui Wang

15:55-16:15 **In vivo investigation of microbubble-enhanced transcranial focused ultrasour neuromodulation and sustainable antihypertensive effect（Invited Talk）**
Siyuan Zhang, Dapeng Li, Zhiwei Cui, Mingxi Wan

16:15-16:35 **Study on the Nonlinear Characteristic of Sandwich Piezoelectric Ultrasonic Transducer (Invited Talk)**
Long Xu, Jiawei Yu, Zhongji Yang

16:35-16:50 **Thermoacoustic Coupling and Stability Enhancement in High-Temperature Levitation**
Pengfei Wu, Xiaozhen Wang, Delong Xu, Weijun Lin

16:50-17:05 **Advancing on-chip ultrasonic manipulation: From microscale engineering to nanoscale control**
Junjun Lei

17:05-17:20 **Generation of Extreme Acoustic Conditions via Spherically Standing Wave Focused Ultrasound under High Hydrostatic Pressure**
Dan Song, Jie Wang, Jiupeng Xiong, Yalu Liu, Huan Liu, Chengyong Li, Faqi Li

17:20-17:35 **Ultrasound-assisted electrocoagulation (US-EC) flow field regulation and sediment particle flocculation mechanism**
Yifeng Liu, Wenwen Bai

17:20-17:35 **Flocculation characteristics and mechanism of suspended sediments under ultrasonic-electrocoagulation（US-EC）coupling**
Wenwen Bai

17:50-18:05 **Cavitation structure regulation based on periodic boundary conditions**
Zhaokang Lei, Jiayu Ma, Xiajie Guo, Chenghui Wang

18:05-18:20 **Research Progress on the Application of Power Ultrasound in Wet Zinc Smelting**
Li Jing, Zhang Libo

Thursday, July 3rd, 2025-Session 15: Computational Acoustics
Chair Persons: Haijun Wu, Guangzheng Yu

15:55-16:15 **Acoustic metagratings: From principle to applications (Invited Talk)**
Jun Mei

16:15-16:35 **Underwater Nonlinear Acoustic Fields Calculation Using the Finite-Difference Time-Domain method (Invited Talk)**
Haoyang Zhang, Wenbo Sun, Jie Shi, Junyu Chen, Zepu Shen

16:35-16:50 **Topology Optimization of Finite Phononic Crystals for Vibration Isolation Based on Level Set Method and Boundary Element Method**
Zaizheng Ge, Changjun Zheng, Haifeng Gao, Chuanxing Bi

16:50-17:05 **Data-Driven Method for Predicting Long-Distance Acoustic Transmission Loss in the Deep Ocean**
Zhao Sun, Yongxian Wang, Siyuan Liao, Wenfeng Liu

17:05-17:20 **Supersonic Flow-Induced Acoustic Resonance and Flutter Modulation in a Piezoelectric Beam-Cavity System with Finite-Amplitude Sound Waves**
Shuai Liu, Hao Liu, Jiawei Mao, Yegao Qu, Penglin Gao, Guang Meng

17:20-17:35 **Numerical Investigation of Nonlinear Acoustic Effects in Micro-Perforated Hearing Protectors**
Qifan Xu

17:35-17:50 **Variational Inference-Based Full Waveform Inversion for Improved Uncertainty Quantification in Medical Ultrasound**
Qiang Li, Zehao Wang, Chengcheng Liu, Dean Ta

17:50-18:05 **Conditioned Diffusion Models for High-fidelity Ultrasound Computed Tomography**
Tianyu Liu, Heyu Ma, Peiwen Li, Aiduo Wang, Chengcheng Liu, Boyi Li, Dean Ta

18:05-18:20 **Local discontinuous Galerkin schemes for an ultrasonic propagation equation with fractional attenuation**
Can Li, Min-min Li, Zine El Abiddine Fellah

Friday, July 4th, 2025-Session 16: Acoustic Microfluidics
Chair Person: Xiasheng Guo

8:00-8:20 **Surface Acoustic Wave-based Microfluidics for Biomedical Applications (Invited Talk)**
Jinsoo Park

8:20-8:40 **Smart Detection of Blood cells by Acousto-Optic Amplification (Invited Talk)**
Yifan Wang, Tao Jiang, Yihan Ma, Keyu Chen, Xiaotong Si, Yi Yang

8:40-8:55 **Dynamic and multifunctional manipulation of cells in a multi-well plate using an acoustic vortex tweezer**
Shifang Guo, Xinru Hu, Wanlin Jia, Yan Li, Zhen Ya, Mingxi Wan

8:55-9:10 **A Hand-held in-Situ Nucleic Acid Detection Device Based on Dual-Function GHz Acoustofluidic Resonator**
Tiechuan Li and Xuexin Duan

9:10-9:25 **Acoustic Sorting Technology for Various Cell Analysis and Screenin**
Shizheng Zhou, Yuxin Wang, Ziyu Huang, Yu Liu, Yinning Zhou

9:25-9:40 **A Filter-free Acoustic Manipulation Chip for Enriching Metallic Particles in Lubricating Oil**
Xiaolong Lu, Ying Wei, Long Cao, Bincheng Zhao, Zhexiao Zhu

9:55-10:10 **Micro Robotics based on Movable Surface Acoustic Wave Tweezers**
Xianming Qin, Shuo Liu, Weidong Wang, Xueyong Wei

10:10-10:25 **Selective assembly of particles with synchronized Acoustic Tweezers: Oblique incidence**
Shuo Liu, Zhe Zhang, Shiyu Li, Yicheng Feng, Zhixiong Gong

10:25-10:40 **Microparticle enrichment and steering via frequency controlled acoustic bubble array**
Zhaoyu Deng, Zhichao Ma, Xiaozhou Liu

10:40-10:55 **Acoustic Band-Pass Photobleach Shield for Live-Cell Phenotypic Tracking**
Yuxin Wang, Yinning Zhou

10:55-11:10 **Investigation of acoustic radiation on non-spherical micro-objects for shape-based separation**
Muhammad Soban Khan, Mushtaq Ali, and Jinsoo Park

11:10-11:25 **Numerical and Experimental Investigation of Acoustic Streaming Flow for Rapid Biological and Chemical Assays**
Beomseok Cha, Sungwon Kim, Jinsoo Park

11:25-11:40 **Acoustofluidic-assisted Droplet Formation Control for Uniform Energetic Microspheres Fabrication**
Shuo Liu, Chuangyu Zhang, Xueyong Wei

List of Poster Presentations

P-1: **(2025052508263321) Tuning Initial Surface Tension and Buckling Pressure of Monodisperse Microbubbles by Changing Agitation Time**
Chang Lu, Hongyi Zhang, Ruchuan Shi, Peng Qin
Category: Acoustic Bioeffects

P-2: **(2025052421543810) Bending Wave Behavior in Nonlinear Hysteretic Acoustic Metamaterial Beams**
Zhenrong Huang,Ruizu Meng,Jiangyi Zhang
Category: General Nonlinear Acousticsx

P-3: **(2025052322541525) Physical fractal models in different coal body structures**
Yuyan Che, Guangui Zou, Tailang Zhao
Category: General Nonlinear Acoustics

P-4: **(2025052521141094) Numerical and experimental investigation of zero-group velocity combined harmonic generation through counter-directional guided waves mixing**
Changyu Zhang, Mingxi Deng, Weibin Li
Category: General Nonlinear Acoustics

P-5: **(2025052915140952) Numerical Analyses on Nonlinear Dynamic Behaviors of Bubble Array Driven by Ultrasonic Traveling Waves in Fluid**
Yihan Chen, Fangtao Xie, Yegao Qu
Category: General Nonlinear Acoustics

P-6: **(2025052515222840) MSRAR-Net: Single-Shot High-Quality 3D Ultrasound Imaging via Multi-resolution Residual Attention Reconstruction Network**
Tongyu Wang, Xipeng Chen, Chaoyu Wang, Pengfei Xu, Xiaoke Zhang, Diya Wang
Category: Ultrasonic Imaging and Therapy

P-7: **(2025052423051166) Safety Evaluation of Transcranial Focused Ultrasound Stimulation in C57BL/6J Mice**
Xuanjie Ye, Sujie Wang, Jingjia Yuan, Kaiping Wang, Yu Sun
Category: Ultrasonic Imaging and Therapy

P-8: **(2025052316535794) Revealing Cocaine Induced Brain Neurovascular Response Using EEG and Functional Ultrasound Imaging**
Shaoyuan Yan, Dean Ta, Kailiang Xu
Category: Ultrasonic Imaging and Therapy

P-9: **(2025052511004637) Microbubble extraction in nonlinear contrast-enhanced ultrasound Imaging**
Shuangyi Cheng, Kailiang Xu
Category: Innovative Acoustic Technology Transformation

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P-10: **(2025051416532920) Predicting the high intensity focused ultrasound focus in vivo using acoustic radiation force imaging**
Xinwang Shi, Fenglong Zhao, Lian Feng, Yijing Liu, Xiaowei Zhou
Category: High Intensity Focused Ultrasound

P-11: **(2025051416532920) Simulation of Head-related Transfer Functions for Different Microphone Positions in Hearing Aids**
Jin Yu，Guangzheng Yu，Qinglin Meng
Category: Computational Acoustics

P-12: **(2025052413572240) Analysis of Ultrasonic Excitation Signals on Attenuation Measurement Accuracy in Calcaneus-Mimicking Phantoms: Impact of Diffraction Effect and Signal Modulation**
Hengda Zhang, Delin Wu, Guangzhen Xing, Xiaobo Wang, Shenping Gao, Hongyuan Wang, Lei Yao
Category: Acoustic Metrology

P-13: **(2025052410501412) Research on High Sound Pressure Calibration Device for Surface Microphones Based on Resonant Coupling Tubes**
Shan He, Jianmin Qiu, Mingjun Cheng, Zhikai Zhang, Shuaijun Sang
Category: Acoustic Metrology

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