

# TECHNICAL PROGRAM AND SPECIAL SESSIONS

## TECHNICAL PROGRAM

Contributed papers are welcome in all branches of acoustics. The technical program will consist of lecture and poster sessions. Technical sessions will be scheduled Monday through Friday, 5–9 November 2018.

Every effort will be made to schedule contributed abstracts in accordance with author and Organizing Committee preferences. However, authors should be prepared to accept assignment to poster sessions. Assignments will take into account: a) author preference, b) program balance, and c) Technical Committee instructions. Abstracts will be rejected if they do not comply with the instructions.

Special sessions described below are planned for the meeting. Authors of invited papers must indicate the title of the special session in which they have been invited to participate when the abstract is submitted. Authors of contributed papers have the option to request placement of their abstracts in these sessions. If no special session placement is requested, contributed papers will be scheduled in sessions with abstracts of similar technical content.

## SPECIAL SESSIONS, ORGANIZERS, AND DESCRIPTIVE SENTENCES

### ACOUSTICAL OCEANOGRAPHY (AO)

Arctic Acoustical Oceanography  
(Joint with Underwater Acoustics, Animal Bioacoustics, Signal Processing in Acoustics)  
Organized by: Peter Worcester, Mohsen Badiey, Hanne Sagen

Experimental Assessment of Theories of Sound Propagation in Sediments  
(Joint with Underwater Acoustics)  
Organized by: Orest Diachok, N. Ross Chapman

Machine Learning and Data Science Approaches in Ocean Acoustics  
(Joint with Animal Bioacoustics, Underwater Acoustics, Signal Processing in Acoustics)  
Organized by: Wu-Jung Lee, Shima Abadi

Ocean Observatories: Laboratories for Acoustical Oceanography  
(Joint with Underwater Acoustics, Animal Bioacoustics)  
Organized by: Bruce Howe, Thomas Dakin

### ANIMAL BIOACOUSTICS (AB)

Anything You Can Do I Can Do Better: Bat Versus Dolphin Biosonar  
(Joint with Signal Processing in Acoustics)  
Organized by: Laura Kloepper, Brian Branstetter

Combining Passive and Active Acoustics for Ecological Investigations  
(Joint with Signal Processing in Acoustics)  
Organized by: Simone Baumann-Pickering, Ana Širović

Fish and Marine Invertebrate Bioacoustics  
Organized by: Bruce Martin, Xavier Mouy

Passive Acoustic Density Estimation: Recent Advances and Outcomes for Terrestrial and Marine Species  
(Joint with Acoustical Oceanography, Signal Processing in Acoustics)  
Organized by: Thomas Norris, Tiago Marques

### DESCRIPTIVE SENTENCES

Observations and modeling of acoustic propagation and ambient sound in the Arctic, including the effects of recent changes in the sea ice, ocean stratification, and other ocean processes and the application of acoustic methods to study these changes

Experimental evidence which sheds light on or suggest theoretically motivated experiments that can clarify the viability of theories of sound propagation in sediments

There is an increasing number of applications of machine learning methods in ocean acoustics, particularly when working with large data sets. This session will focus on researches employing data-driven methods and related topics on data access, code sharing, reproducible research, and others

Biological, geophysical, chemical, and physical oceanographic acoustical studies associated with ocean observatories

Presenters argue why their suborder's biosonar is superior to the other--presenters must include a comparison of bats and dolphins in their talk

The concurrent use of passive and active acoustics to simultaneously document a variety of animals in the water column for ecological investigations has shown great advances over the past years. This session will highlight advances that can be made combining acoustic techniques for ecosystem monitoring

Opportunity for researchers to present the latest results on fish and marine invertebrates bioacoustics. New information on sound production and perception by this diverse group is welcomed, as well as innovations in measurement techniques

Passive acoustic density estimation is becoming more widely used as a method to estimate the density and abundance of species, especially those which are vocally active and/or are cryptic, difficult to observe visually, or elusive. This session will focus on recent advances in this relatively new area of research for both terrestrial and marine species

## ARCHITECTURAL ACOUSTICS (AA)

Advances in the Laboratory Testing of Materials  
(Joint with Noise, ASA Committee on Acoustics, Structural  
Acoustical and Vibration)  
Organized by: Ron Sauro

Architectural Acoustics and Audio: Even Better Than The Real  
Thing  
Organized by: K. Anthony Hoover, Alex U. Case

Auditorium Acoustics and Architectural Design: Challenges and  
Solutions  
(Joint with ASA Committee on Acoustics)  
Organized by: Jin Yong Jeon, Ning Xiang

Microphone Array Applications in Room Acoustics  
(Joint with Engineering Acoustics, Signal Processing in Acoustics  
and Noise)  
Organized by: Michael Vorländer, Gary Elko

Session in Memory of Murray Hodgson  
(Joint with Noise)  
Organized by: Maureen Connelly, Nicola Prodi, David Woolworth

Sustainable Acoustics in Social Space and WELL Buildings  
Organized by: Siu-Kit Lau, Andy Chung, Ethan Bourdeau

Validation of Modeling and Analysis: Predictions and Outcomes  
(Joint with Noise)  
Organized by: Logan D Pippitt, Benjamin Bridgewater

## BIOMEDICAL ACOUSTICS (BA)

Bubble Trouble in Therapeutic Ultrasound  
(Joint with Physical Acoustics)  
Organized by: Christy Holland, Klazina Kooiman

Shock Waves and Ultrasound for Calculus Fragmentation  
(Joint with Physical Acoustics)  
Organized by: Juliana Simon, Michael R. Bailey

State of the Art in Lung Ultrasound: Past, Present, and Future  
(Joint with Physical Acoustics)  
Organized by: Libertario Demi, Martin Verweij

Targeted Drug Delivery - Acoustic Radiation Force  
(Joint with Physical Acoustics)  
Organized by: John Allen, Alfred Yu

## DESCRIPTIVE SENTENCES

Changes, both in method and capabilities of labs and standards.  
This can include equipment, procedures, theories and expansions

Adapting, enhancing and fictionalizing acoustics through  
architectural, audio and signal processing systems

Examples of new concepts and techniques in the design of  
architectural acoustics such as concert halls and opera houses.  
The alternatives of the acoustical designs are evaluated by the  
computer simulation or the scale model experiment to be reflected  
in the final design with the aim of the acoustic performance  
suitable for the various genres. The acoustic performance of a  
space can be confirmed through the measurement of the room  
acoustics and the background noise levels in the building after  
completion.

Spherical arrays applied in measurements of diffuseness, material  
reflection properties, or directional reverberation; Spherical arrays  
used for recording spatial sounds, mix to spatial audio formats,  
binaural etc.; Spherical and other arrays topologies used for  
source separation, classification of source and room features

Honoring Murray Hodgson's contributions to the measurement,  
characterization, prediction, and control of sound fields in rooms,  
especially industrial workshops, offices, classrooms, and health-  
care facilities

To facilitate the development of the built environment for future  
generations and increase the awareness of the acoustics in  
sustainable (or green building) architecture, this session would like  
to address the current technologies and understanding of  
sustainable acoustics and their environments in social spaces  
(including restaurants, entertainment facilities, etc.) and WELL  
buildings. The sustainable acoustics environment should enhance  
the ability for future generations to meet their own needs

Simulations, modelings, calculations, and auralizations are how we  
predict the way a space will sound. Verifying these predictions is  
crucial to the improvement of our analysis methods. This session  
will provide comparisons of acoustical and sound reinforcement  
predictions to the final built environment

Bubbles have enabled exciting diagnostic and therapeutic  
ultrasound applications. This session will explore the challenges  
presented by detecting, controlling, and mapping bubble activity in  
ultrasound-mediated drug and bioactive gas delivery, tissue  
ablation, acoustic droplet vaporization, and therapeutic targeting

Topics related to the medical use of acoustics to disrupt  
calcification in the body

Comprehensive overview of the state of the art in lung ultrasound.  
Clinical, safety and technical aspects of lung ultrasound will be  
discussed. Particular attention will be given to imaging artifacts  
and new lung ultrasound imaging techniques

Role of the acoustic radiation force in both theoretical and  
experimental aspects of drug delivery with targeted contrast  
agents and particles

## **BIOMEDICAL ACOUSTICS (BA) (continued)**

Therapeutic Ultrasound Transducers  
(Joint with Physical Acoustics)  
Organized by: Adam Maxwell, Tatiana D. Khokhlova

Wave Propagation in Complex Media: From Theory to Applications  
(Joint with Structural Acoustics and Vibration, Physical Acoustics)  
Organized by: Guillaume Haiat, Pierre Belanger

## **ENGINEERING ACOUSTICS (EA)**

Acoustic Particle Velocity Sensors, Algorithms, and Applications in  
Air  
(Joint with Noise)  
Organized by: Michael V. Scanlon

## **EDUCATION IN ACOUSTICS (ED)**

Measuring Educational Outcomes  
Organized by: Robert D. Celmer, Andrew Piacsek

## **INTERDISCIPLINARY (ID)**

Excellence in Acoustics Around the World  
(Joint with ASA Committee on Standards)  
Organized by: Brigitte Schulte-Fortkamp, Ann R Bradlow,  
Jean-Pierre Hermand, Gopu Potty, Andy Chung

Graduate Studies in Acoustics Poster Session  
(Joint with Student Council, Engineering Acoustics)  
Organized by: Trevor W. Jerome

Inclusion, Diversity, and Equity in Acoustics  
(Joint with Women in Acoustics)  
Organized by: Dominique A. Bouavichith, Kelly Whiteford, Evelyn  
Hoglund

## **MUSICAL ACOUSTICS (MU)**

Computational and Experimental Investigations of Flow in Musical  
Instruments  
(Joint with Structural Acoustics and Vibration, Signal Processing  
in Acoustics)  
Organized by: Whitney Coyle

Modeling Musical Instruments and Effects  
(Joint with Signal Processing in Acoustics)  
Organized by: Scott Hawley, Vasilis Chatzioannou

Percussion Instruments  
(Joint with Physical Acoustics, Structural Acoustics and Vibration)  
Organized by: Uwe Hansen, Andrew Morrison

## **DESCRIPTIVE SENTENCES**

Design, metrology, and bioeffects of therapeutic and dual use  
transducers

The understanding of the interaction between an acoustic wave  
and a complex medium is an important problem in various  
applications such as non-destructive evaluation or biomedical  
ultrasound. This session will focus on experimental issues as well  
as on modeling and simulation works, including the development  
of inversion procedures

Acoustic particle velocity sensors, or vector sensors, have the  
ability to localize acoustic targets with very small form-factors.  
Airborne sensing with vector sensors provides unique capabilities  
for military, law-enforcement, entertainment and communications  
applications. Topic includes emerging R&D, performance evalua-  
tions and applications

Models for measuring outcomes from educational activities in  
acoustics

Recent developments and future plans in acoustics in different  
countries around the world will be introduced by the respective  
ambassadors. The objective is to increase international  
collaboration and communication in all matters on acoustics

A wide range of Graduate Programs in Acoustics will present, in  
poster format, what their University has to offer a prospective  
student

As part of Strategic Plan Task Force 2 on Membership  
Engagement and Diversity, a panel of speakers will discuss how  
principles of Inclusion, Diversity, and Equity can be incorporated  
into the Society's practices to more effectively engage members  
from a variety of backgrounds, specifically with regard to issues of  
diversity in education and membership

Visualization, measurement, and computational modeling of air  
flow in and around musical instruments

The intersection of physical modeling of musical instruments and  
related sound effects including synthesis of musical instrument  
sound, the interaction between instrument and acoustic spaces,  
special problems to overcome and measurements to quantify  
model parameters

Work on all types of percussion musical instruments

## **NOISE (NS)**

Acoustic Vehicle Alerts: Effects on Soundscape, Quality of Life, and Traffic Safety  
(Joint with Psychological and Physiological Acoustics)  
Organized by: Jeanine Botta, Brigitte Schulte-Fortkamp

Effects of Noise on Human Performance  
(Joint with Speech Communication, Psychological and Physiological Acoustics)  
Organized by: Joonhee Lee

Emerging Technologies for Noise Control  
(Joint with Physical Acoustics, Structural Acoustics and Vibration, Architectural Acoustics)  
Organized by: Ning Xiang, Kirill Horoshenkov

Noise and Vibration from Fitness Activities  
(Joint with Structural Acoustics and Vibration, Architectural Acoustics)  
Organized by: Matthew Golden, James Phillips

Supersonic Jet Aeroacoustics  
(Joint with Physical Acoustic, Signal Processing in Acoustics, ASA Committee on Standards)  
Organized by: Alan Wall, Allan Aubert, Kent Gee

Structure-Borne Noise in Buildings and What We Can Do About It  
(Joint with Architectural Acoustics, Structural Acoustics and Vibration, ASA Committee on Standards)  
Organized by: James Phillips, Bonnie Schnitta

Technological Challenges in Noise Monitoring  
(Joint with ASA Committee on Standards, Signal Processing in Acoustics)  
Organized by: Matthew Blevins, Anton Netchaev

## **PHYSICAL ACOUSTICS (PA)**

Acoustic Metamaterials and Super-Resolution Imaging  
(Joint with Signal Processing in Acoustics)  
Organized by: Matthew Guild, Jeffrey Rogers

Challenges in Computational Acoustics  
(Joint with Architectural Acoustics, Noise, Signal Processing in Acoustics, Underwater Acoustics)  
Organized by: D. Keith Wilson, Matthew Blevins

Interactions of Sound Beams with Objects  
(Joint with Biomedical Acoustics)  
Organized by: Likun Zhang, Grant Eastland

Novel Approaches to Acoustic and Elastic Wave Experimentation: Concepts, Hardware and Novel Processing Methods  
(Joint with Engineering Acoustics)  
Organized by: Michael R. Haberman, Dirk-Jan van Manen, Theodor Becker, Nele Boersing

Outdoor Sound Propagation  
(Joint with Noise, ASA Committee on Standards)  
Organized by: Vladimir Ostashev, Philippe Blanc-Benon, D. Keith Wilson

## **DESCRIPTIVE SENTENCES**

An exploration of vehicle alerts such as horn sounds and electronic signals that serve as status reports throughout shared spaces including residential neighborhoods, urban settings, and national parks

How noise can affect the performance in physical and cognitive tasks

New materials to improve the qualities of noise control

Assessment and prediction of noise and vibration from fitness related activities such as treadmills, group activities, and weight drops

Noise characterization of supersonic jets through measurement, modeling, and simulation of aeroacoustic phenomena informs jet noise reduction technologies, launch vehicle, payload, and launch pad damage risk models, and personnel and community noise predictions for commercial and military aircraft

Interior noise from sources of vibration within and without buildings: what causes it, how does it get there, how is it predicted and measured, and how we control it

Innovative solutions to technological challenges faced in noise monitoring or measurement systems (e.g., system response, long-term operation, power consumption, sensor footprint, etc.)

Explore novel methods of generating, detecting and imaging acoustic waves at scales smaller than the diffraction limit

Solutions to challenging computational acoustics problems requiring new or unconventional techniques or approaches

Recent advances of sound beam interactions with objects via scattering, radiation pressure and angular momentum transfer

Novel designs and ideas of unconventional laboratories for acoustic and elastic wave propagation. Topics include: active boundary control, virtual acoustic immersion, interplay of hardware and processing, hardware-in-the-loop approaches, real-time processing, application-specific transducers design

All aspects of sound propagation in the atmosphere such as the effects of turbulence and stratification, sound interaction with impedance ground and barriers, numerical implementation, and signal processing

## **PHYSICAL ACOUSTICS (PA) (continued)**

Willis Coupling in Acoustic Metamaterials  
(Joint with Structural Acoustics and Vibration, Signal Processing  
in Acoustics)  
Organized by: Michael R. Haberman, Feruza Amirkulova

## **PSYCHOLOGICAL AND PHYSIOLOGICAL ACOUSTICS (PP)**

Acoustics Outreach: Linking Physiology and Behavior for Future  
Collaborations  
Organized by: Amanda Lauer, Anna Diedesch

Music, Speech, and the Brain  
(Joint with Speech Communication, Musical Acoustics)  
Organized by: Christina Zhao, Patricia Kuhl

Speech Perception in Children with Hearing Impairment  
(Joint with Speech Communication)  
Organized by: Mishaela DiNino, Kelly Jahn

Understanding Limitations on Auditory Spatial Acuity  
Organized by: Andrew Brown

## **SIGNAL PROCESSING IN ACOUSTICS (SP)**

Detection and Tracking of Mobile Targets  
(Joint with Underwater Acoustics, Engineering Acoustics, Physical  
Acoustics)  
Organized by: Kainam Thomas Wong, Siu-Kit Lau

Geometric Signal Processing in Acoustics  
(Joint with Speech Communication)  
Organized by: Ananya Sengupta

Machine Learning for Acoustic Applications  
(Joint with Acoustical Oceanography, Architectural Acoustics,  
Musical Acoustics, Underwater Acoustics, Noise)  
Organized by: Peter Gerstoft, Weichang Li

## **SPEECH COMMUNICATION (SC)**

Phonetics of Under-Documented Languages  
Organized by: Benjamin V. Tucker, Richard Wright

Recent Advances in Experimental, Computational, and Clinical  
Research in Voice Production and Perception  
(Joint with Biomedical Acoustics, Signal Processing in Acoustics)  
Organized by: Zhaoyan Zhang, Michael Döllinger

The Sound of Emotion  
(Joint with Musical Acoustics, Psychological and Physiological  
Acoustics)  
Organized by: Shae Morgan, Kathrin Rothermich

## **DESCRIPTIVE SENTENCES**

Theoretical, numerical, and experimental research on acoustic metamaterials displaying Willis coupling, also known as bianisotropic acoustic media

Presentations from early career investigators and others bridging the gap between physiology and perception. Intended to facilitate increased and lasting interactions between scientists performing basic and applied research linking physiology and behaviour

Music and speech share similarities at many levels. The session will explore mechanisms related to music and speech sound processing using different brain and behavioral methods, covering studies from infancy to adulthood

Highlighting work that has attempted to disentangle the factors that limit spatial hearing acuity or accuracy, for example, acoustic factors from perceptual ("system") factors in the marked variation of spatial hearing performance across azimuth

Factors that relate to speech perception abilities in children with different hearing histories and interventions

Detection, localization and tracking of mobile objects such as aircraft, surface ships and unmanned vehicles

Topographical methods and non-linear manifold signal and feature modeling applied to acoustic phenomena

Machine learning and diverse data adaptive modeling and inference methods related to acoustic phenomena

Of the over 6000 world languages only a very small percentage have been investigated from a phonetic perspective, resulting in a major lack of acoustic description of these languages

Issues and review of recent advances in voice production and perception research

Broad overview of emotion and affect in the acoustic signal. Research on the production and perception of affective speech and non-speech sounds

## STRUCTURAL ACOUSTICS AND VIBRATION (SA)

Acoustic Metamaterials  
(Joint with Physical Acoustics)  
Organized by: Christina J. Naif, Alexey S. Titovich

Advanced Modeling Techniques for Computational Acoustics  
(Joint with Physical Acoustics, Underwater Acoustics, Architectural Acoustics)  
Organized by: Kuangcheng Wu, Elizabeth A. Magliula, James E. Phillips

Advances in Thermoacoustics  
(Joint with Engineering Acoustics, Physical Acoustics)  
Organized by: Matthew Kamrath, Robert M. Koch

History of Computational Methods in Structural Acoustics and Vibration  
(Joint with Noise, Signal Processing in Acoustics)  
Organized by: James E. Phillips, Benjamin Shafer, John B. Fahnlne

Utilization of High-Speed Cameras to Measure Vibration  
(Joint with Engineering Acoustics, Signal Processing in Acoustics)  
Organized by: Micah R. Shepherd, Trevor W. Jerome

## UNDERWATER ACOUSTICS (UW)

Acoustic Vector Field Studies  
(Joint with Signal Processing in Acoustics, Structural Acoustics and Vibration)  
Organized by: Kevin Smith, Robert J. Barton

Biological Effects on Seabed Geoacoustic Properties  
(Joint with Acoustical Oceanography, Animal Bioacoustics, Physical Acoustics)  
Organized by: Kevin M. Lee, Megan S. Ballard, Kelly M. Dorgan

Sediment Acoustics – Inferences from Forward Modeling, Direct, and Statistical Inversion Methods  
(Joint with Acoustical Oceanography, Signal Processing in Acoustics, Physical Acoustics)  
Organized by: Charles W. Holland, Stan E. Dosso

Unmanned Vehicles and Acoustics  
(Joint with Signal Processing in Acoustics, Structural Acoustics Vibration, Physical Acoustics)  
Organized by: Erin Fischell

Variability in Shallow Water Propagation and Reverberation  
(Joint with Acoustical Oceanography, Signal Processing in Acoustics)  
Organized by: Todd Hefner, David Dall'Osto

## DESCRIPTIVE SENTENCES

Theoretical and computational analysis of new metamaterial structures, experimental validation, and characterization of prototype unit cells or bulk materials, and demonstrations of the uses for acoustic metamaterials

Ideas/techniques that enable researchers to quickly evaluate and understand the results from numerical predictions in the fields of Structural Acoustics and Vibration, Underwater Acoustics, Architectural Acoustics, etc.

Recent advances in thermoacoustics from thermoacoustic engines to thermophone transducers and beyond

Development of computational methods in structural acoustics and vibration from the early days of 2-dimensional modal analysis on computer mainframes to the current state-of-the-art complex 3-dimensional multi-media dynamic time domain analysis on desktop PCs, and everything in between

Measurement of structural vibration using high-speed cameras including image processing theory, computational requirements, and experimental setup. Applications with rigorous validation are also encouraged

General features of the underwater acoustic vector field, advances in signal processing, sensors, and utilization of the underwater acoustic vector field for environmental assessment or other inversion algorithms

Measurements and modeling of the effects of biological activity on the geoacoustic properties of the seabed, including changes to bulk density, porosity, compressional and shear wave speed and attenuation, and seafloor roughness

Quantitative knowledge of seabed properties is important for industrial, military, and scientific applications. A wide variety of measurement and inference techniques have been developed over the years to address challenging physics associated with the acoustics of marine sediments. This session brings together the latest techniques

Application of unmanned and autonomous vehicles for underwater acoustic sensing

Measurements and modeling of propagation and reverberation in temporally and spatially varying environments. Includes but is not limited to variability of clutter, evolution of sea surface roughness, and range dependent oceanography