

# 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, 2–6 December 2019.

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 abstract submission guidelines and submission 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)

Bioacoustics and Acoustical Oceanography: 20 Years Later  
(Joint with: Animal Bioacoustics)  
Organized by: Andone Lavery, Kelly Benoit-Bird

Marine Seismoacoustics  
(Joint with: Underwater Acoustics)  
Organized by: Ralph Stephen, Warren Wood

Observational Acoustical Oceanography: A Look at Enabling  
Technology from Academia and Industry  
(Joint with: ASA Committee on Standards)  
Organized by: Andrey Morozov

Special Session in Honor of Michael Buckingham  
(Joint with: Underwater Acoustics)  
Organized by: Simon Freeman, Grant Deane, David Barclay

### ANIMAL BIOACOUSTICS (AB)

Applications of Machine Learning to Bioacoustics  
(Joint with: Signal Processing in Acoustics, Acoustical  
Oceanography, Computational Acoustics)  
Organized by: Kaitlin E. Frasier, Marie A. Roch

Low-Frequency Sound Production and Passive Acoustic  
Monitoring  
(Joint with: Acoustical Oceanography)  
Organized by: Ana Širović, Jack Butler

Standards in Animal Bioacoustics—Purpose, Need, and Application  
(Joint with: ASA Committee on Standards)  
Organized by: Dorian Houser, Kurt Fristrup

Urban Noise: Its Effects on Animals' Acoustic Communication  
Organized by: Benjamin N. Taft, Kurt Fristrup

### DESCRIPTIVE SENTENCES

On the 20th anniversary of a formative session, the impact of new acoustic tools and deployment platforms on addressing marine biological questions will be discussed

Talks on the interaction between ocean acoustics and the vibration of the solid earth including earthquake and volcano generated T-phases, bottom interacting ocean acoustics, seismic observations of oceanic sounds, marine multi-channel seismology, and the vibration of floating ice

Advances in instrumentation for monitoring the ocean, geologic structures and marine ecosystems

Recognition of the contributions of Michael Buckingham in advancing the study of ocean acoustics, such as the theory of sediment acoustics, ambient noise in the deep ocean and in polar regions, fundamental acoustics theory in complex environments and bubble acoustics. Retrospective, historical, and contemporary papers that address any aspect of these topics are invited

Practical applications of machine learning to address challenges in bioacoustic research

Discussions of what can be learned about the ecology of animals and state of the ecosystem from long-term acoustic data focusing on low frequencies (up to a few kHz)

Recent growth in methods applied to wildlife acoustics has occurred, including assessments of the effects of noise on wildlife, passive acoustic monitoring methods, and procedures to measure animal hearing. For these and other emerging topics, development of normative procedures (standards) encourages comparable measurements and results. This session highlights progress on normative procedures in animal bioacoustics, including national standards development and application

Exploring the profound impact that the city's soundscape can have on the timing, effectiveness, and characteristics of the acoustic signals of animals

## ARCHITECTURAL ACOUSTICS (AA)

### Architectural Soundscapes

(Joint with: Noise)

Organized by: Gary Siebein, Keely Siebein, Hyun Paek

Soundscape measurement, analysis, design and evaluation methods and case studies in architectural settings

### Assembly Space Renovation Challenges

Organized by: Joe Keefe

Acoustical challenges of and solutions for renovated assembly spaces (auditoriums, gymnasiums, atriums, etc.)

### Computational Acoustics for Architectural Applications

(Joint with: Computational Acoustics)

Organized by: Laura C. Brill, Michael Vorländer

Showcase of architectural applications for computational acoustic methods

### How Does Speech Perception Work: A Tutorial and Panel Discussion for Architectural Speech Privacy

(Joint with: Psychological and Physiological Acoustics, Speech Communication, ASA Committee on Standards)

Organized by: Jennifer Lentz, Kenneth W Good, Jr

A tutorial on speech perception for architectural speech privacy will be presented by a panel of invited speakers

### Large Music Rehearsing Spaces

(Joint with: Musical Acoustics)

Organized by: Brian Corry

Case studies of large music rehearsal spaces. Includes discussion of the needs/desire for the space, or issues with existing spaces, and the design solutions implemented in the new/renovated

### Sound Transmission and Impact Noise in Buildings

(Joint with: Noise, Structural Acoustics and Vibration, ASA Committee on Standards)

Organized by: Matthew Golden, Benjamin M. Shafer

General topics in sound transmission and impact noise in the built environment

### Sustainable Acoustics for Smart Cities

(Joint with: Noise)

Organized by: Siu-Kit Lau, Andy Chung

This session will address the current needs of sustainable acoustics and their environments for smart cities, facilitate the development of the built environment harmonizing with nature and to increase the awareness of acoustics in sustainable architecture and city planning

## BIOMEDICAL ACOUSTICS (BA)

### Application of Quantitative Ultrasound *in vivo* in Humans

Organized by: Jonathan Mamou, Michael Oelze

Recent advances in quantitative ultrasound methods for biomedical applications in humans using *in vivo* including novel technologies to solve a wide range of diagnostic issues

### Cavitation Bioeffects

Organized by: Juliana Simon, Hong Chen

Focuses on topics related to the biological effects of cavitation bubbles, including, lithotripsy, cavitation-mediated drug delivery, and thrombolysis

### Cavitation Nuclei: Bubbles, Droplets, and More

(Joint with: Physical Acoustics)

Organized by: James Kwan, Shashank Sirsi

Exploring new developments on the design and manufacture of cavitation nuclei as well as discussing their response to ultrasound and novel applications

### High Frame Rate Ultrasound Imaging: Technical Developments and Clinical Applications

(Joint with: Signal Processing in Acoustics)

Organized by: Libertario Demi, Alessandro Ramalli

High frame rate ultrasound imaging, based on the transmission of simultaneously focused beams or diverging/plane waves, has become increasingly popular in medical ultrasound imaging. The relevance and broad range and applications of these modalities has pushed the development of many innovative solutions in terms of devices, beam forming schemes and applications that will be discussed and reviewed

### New Frontiers in Doppler Ultrasound

Organized by: Alfred Yu, Jeffrey A. Ketterling

Latest technological advances in Doppler ultrasound, including novel transmit sequences, processing algorithms, phantom design, and new application domains

### Ultrasound Phantom Development and Tissue Characterization

Organized by: Yunbo Liu, Matthew Myers

Topics related to ultrasound phantom development and tissue acoustic property quantifications for both therapeutic and diagnostic ultrasound applications

## COMPUTATIONAL ACOUSTICS (CA)

### Applications of Model Reduction in Computational Acoustics

(Joint with: Structural Acoustics and Vibration, Signal Processing in Acoustics)

Organized by: Kuangcheng Wu, D. Keith Wilson

Model reduction approaches to reduce computational time in analyzing large datasets or to simplify large, complex numerical models. These approaches may be based on physical insights or on advanced numerical techniques

## COMPUTATIONAL ACOUSTICS (CA) (continued)

Parabolic Equation Methods Across Acoustics  
(Joint with Physical Acoustics, Underwater Acoustics, Acoustical Oceanography, Signal Processing in Acoustics, Structural Acoustics and Vibration)  
Organized by: Michelle Swearingen, Jennifer Cooper

## ENGINEERING ACOUSTICS (EA)

Acoustical Engineering in Consumer Electronics  
(Joint with: Structural Acoustics and Vibration)  
Organized by: Caleb F. Sieck, Edward M. Okorn

Acoustic Holography and Visualization of Sound: Methods and Applications  
(Joint with: Physical Acoustics, Structural Acoustics and Vibration)  
Organized by: Michael Scanlon, Caleb Goates

## EDUCATION IN ACOUSTICS (ED)

Hands-On Demonstrations for Middle- and High-School Students  
Organized by: Keeta Jones, Tracianne B. Neilsen, Daniel A. Russell

Listen-Up and Get Involved!  
(Joint with: Women in Acoustics)  
Organized by: Keeta Jones, Tracianne B. Neilsen, Daniel A. Russell

Mentoring Graduate and Undergraduate Students  
(Joint with: Student Council, Women in Acoustics)  
Organized by: Daniel A. Russell, Kent Gee

Selecting a Textbook for Teaching an Acoustics Course  
(Joint with: Musical Acoustics)  
Organized by: Daniel A. Russell, Jack Dostal

Take 5's  
Organized by: Jack Dostal

## INTERDISCIPLINARY (ID)

Guidance from the Experts: Applying for Grants and Fellowships  
(Joint with: Student Council)  
Organized by: Daniel Guest, Eric Rokni

## DESCRIPTIVE SENTENCES

Comparison of the use of parabolic equation methods in different areas in acoustics

Presentations on the unique acoustical challenges that arise in the development of consumer products

Near-field acoustic holography is a method of recording and displaying three-dimensional sound information as color-coded maps and videos. Contributions are welcome that investigate the underlying principles of holography, new methods for estimating the sound field near a source, the measurement of acoustic parameters, novel hand-held or fixed microphone array techniques with pressure and/or particle velocity transducers, broadband beamforming techniques, and visualization of 3D noise maps on 3D models

Acoustics demonstrations for middle and high school students. No abstracts. ASA member volunteers who interact with students from local area high schools. All equipment for 10-15 demonstrations is provided. Anyone interested in volunteering, please contact [kjones@acousticalsociety.org](mailto:kjones@acousticalsociety.org)

Acoustics demonstrations for middle- and high-school aged Girl Scouts. No Abstracts. Equipment is provided for 10-15 demonstration stations and ASA members show demos and interact with students. Anyone interested in volunteering to help can contact [kjones@acousticalsociety.org](mailto:kjones@acousticalsociety.org)

The mentoring of students at both undergraduate and graduate levels is a vital role of the faculty member and the transition from graduate student to new faculty member requires the former mentee to now become a mentor. Papers will include best practices and guidelines for mentoring graduate and undergraduate students, along with tips for success, selecting students from a pool of applicants, dealing with problem students, mentoring across differences, and developing productive and rewarding mentoring relationships

The process of selecting a textbook when asked to teach a new course (or when the standard text goes out of print) can be a daunting task, given the variety (or lack thereof) of textbooks available for both general topics, undergraduate courses or upper level special topics graduate courses. This session will focus on hints for how to determine which books might be appropriate for an acoustics course (at various levels, undergrad through graduate), how to evaluate the content of a textbook and its appropriateness as a text for the course being taught, how to use a new textbook for your course, and what to do when no single book seems to do provide what is needed

For a Take-Five session, no abstract is required. We invite you to bring your favorite acoustics teaching ideas. Choose from the following: short demonstrations, teaching devices, or videos. The intent is to share teaching ideas with your colleagues. If possible, bring a brief, descriptive handout with enough copies for distribution. Spontaneous inspirations are also welcome. You sign up at the door for a five-minute slot before the session begins. If you have more than one demo, sign-up for two consecutive slots

A panel of successful fellowship winners, selection committee members, and fellowship agency members will answer questions regarding grants and fellowships, application advice, and funding opportunities. The panelists will briefly introduce themselves, followed by a question and answer session with the audience

## INTERDISCIPLINARY (ID) (continued)

Introduction to Technical Committees  
Organized by: Kieren Smith, Alex Padilla, Will Doebler

## MUSICAL ACOUSTICS (MU)

Asian Musical Instruments  
Organized by: James P. Cottingham

Experimental Methods in Musical Acoustics: Best Practices  
Organized by: Andrew A. Piacsek

Machine Learning in Musical Acoustics  
(Joint with: Signal Processing in Acoustics, Computational Acoustics)  
Organized by: Bozena Kostek, Scott H. Hawley

## NOISE (NS)

Community Noise  
(Joint with: ASA Committee on Standards)  
Organized by: Eric Reuter, David Woolworth

Current Trends and Advancements in Applying Acoustics to Smart Cities  
(Joint with: Architectural Acoustics, ASA Committee on Standards)  
Organized by: Brigitte Schulte-Fortkamp, Bennett Brooks

Development of New Sounds for Electric Vehicles  
(Joint with: Psychological and Physiological Acoustics, ASA Committee on Standards)  
Organized by: Klaus Genuit, Brigitte Schulte-Fortkamp

Outdoor Entertainment Noise  
Organized by: David Manley, Tony Hoover

Quiet Supersonic Flights 2018  
(Joint with: Signal Processing in Acoustics)  
Organized by: Jonathan Rathsam, Larry Cliatt

Supersonic Jet Aeroacoustics  
(Joint with: Physical Acoustics and Computational Acoustics)  
Organized by: Alan T. Wall, Kent L. Gee

Workshop on Supersonic Jet Aeroacoustics  
(Joint with: Physical Acoustics, Computational Acoustics)  
Organized by: Alan T. Wall

Transportation Noise from its Consequences to the Solution Set  
(Joint with: Animal Bioacoustics, Underwater Acoustics)  
Organized by: Bonnie Schnitta, James Phillips

## PHYSICAL ACOUSTICS (PA)

Aqueous Acoustic Metamaterials  
(Joint with: Engineering Acoustics, Structural Acoustics and Vibration, Underwater Acoustics)  
Organized by: Matthew Guild, Shane Lani, Jason Smoker

Design of Acoustics Metamaterials: Optimization and Machine Learning  
(Joint with: Structural Acoustics and Vibration, Computational Acoustics)  
Organized by: Feruza Amirkulova

## DESCRIPTIVE SENTENCES

A sample of work from each each Technical Committee, representing each of the unique fields of acoustics represented in the ASA.

Acoustics of all types of Asian musical instruments.

Detailed descriptions of methods and procedures to measure quantities of interest in musical acoustics, including discussion of precision, reliability, and cost

Applications of machine learning techniques and algorithms for mining and classifying musical data, performing creative tasks, synthesizing novel sounds or replicating musical instruments, mimicking emotion and mood in music, and enhancing musical education

Measurement, prediction, and mitigation of community noise

New research into soundscape considerations related to smart growth principles, which are strongly relevant for future urban development

Electric vehicles provide a new challenge for the acoustical design of interior and exterior sounds. Interior sounds are needed to inform the driver about the driving situation and exterior sounds are needed to inform people outside from the approaching car

Outdoor entertainment noise; design, modeling, measurements, and perception

Showcase the experimental design and results from NASA's First Large-Scale Quiet Sonic Boom Community Response Test

Noise characterization of supersonic jets through measurement, modeling, and simulation of aeroacoustic phenomena with applications to jet noise reduction technologies, launch vehicle, payload, and launch pad damage risk models, and personnel and community noise predictions for commercial and military aircraft. Please see also the "Jet Noise Reduction Workshop" on p. 11

See page 11 for details

The effects on people and wildlife from transportation noise (land, air, and sea), as well as innovative solutions for reducing noise

Explores the unique challenges of designing, testing and fabricating acoustic metamaterials in underwater and other aqueous environment

Recent advances in optimization and machine learning allow improved design of acoustics metamaterials. This section solicits submissions pertaining to applications of optimization methods, machine learning methods and data mining to metamaterials with particular emphasis on inverse engineering and predicting structure-property relationships. Topics of interest include but are not limited to inverse design of metamaterials with particular functionality or behavior, property prediction, bandgaps, accelerated simulation and algorithm development, topology optimization

## PHYSICAL ACOUSTICS (PA) (continued)

Non-Reciprocal and Topological Acoustics  
(Joint with: Engineering Acoustics)  
Organized by: Michael Haberman, Yun Jing

## PSYCHOLOGICAL AND PHYSIOLOGICAL ACOUSTICS (PP)

Open Source Audio Processing Tools for Hearing Research  
(Joint with Speech Communication)  
Organized by: Volker Hohmann, Caslav Pavlovic

## SIGNAL PROCESSING IN ACOUSTICS (SP)

Eco Active Sonar  
(Joint with: Animal Bioacoustics)  
Organized by: Brian Ferguson, R. Lee Culver

Memorial Session in Honor of Ed Sullivan  
(Joint with: Underwater Acoustics)  
Organized by: Ning Xiang, Brian Ferguson, Zoi-Heleni Michalopoulou

Signal Processing for Architectural Acoustics and Noise Control  
(Joint with: Architectural Acoustics, Noise)  
Organized by: Matthew Scott Byrne, Siu-Kit Lau, Kainam Thomas Wong

Signal Processing for Biological Transients  
(Joint with: Animal Bioacoustics, Underwater Acoustics, Acoustical Oceanography, Speech Communication)  
Organized by: Simon Freeman, Blaine Harker, Philip Caspers

## SPEECH COMMUNICATION (SC)

Self-Perception in Speech Production  
Organized by: Sarah Bakst, Caroline Niziolek

Universal and Experiential Influences on Phonetic Perception  
Organized by: Matthew Masapollo, Linda Polka

## STRUCTURAL ACOUSTICS AND VIBRATION (SA)

Acoustic Metamaterials  
(Joint with: Physical Acoustics, Signal Processing in Acoustics)  
Organized by: Christina Naify, Bogdan Popa

Acoustics of 3D-Printed Materials and Structures  
Organized by: Alexey Titovich, Stephanie G. Konarski

Computational Methods for Mid-Frequency Structural Acoustic Problems  
(Joint with: Computational Acoustics)  
Organized by: Anthony Bonomo, David Raudales

Flow-Induced Vibration and Noise  
(Joint with Noise)  
Organized by: Kuangcheng Wu, Robert M. Koch

Novel Methods for Energy Dissipation in Structures  
(Joint with: Noise, Physical Acoustics, Engineering Acoustics)  
Organized by: Jerry H. Ginsberg, J. Gregory McDaniel

## DESCRIPTIVE SENTENCES

Topological phases, a hallmark of modern condensed matter physics, as well as non-reciprocity, have recently been identified in acoustic systems. This session will showcase new theoretical and experimental developments in these two burgeoning fields

Open tools for research: Hardware and software tools that can be used to investigate novel fitting strategies and algorithms for hearing devices will be shown and can be tried

Ecological (Eco-) Active Sonar is a concept for high-resolution wideband forward-looking sector scan active sonar featuring “unremarkable” sonar transmissions. The biological sonar of dolphins is one example of eco-active sonar. Another example is pulse compression sonar, also known as low probability of intercept or covert active sonar, which transmit low source level, wideband coded signals of long duration that do not disturb the marine ecosystem. This special session considers the properties and effectiveness of eco-active sonars

Celebration of Edmund J. Sullivan's life (an ASA Silver Medalist) and his contributions to model-based signal processing, including, but not limited to synthetic aperture acoustic arrays, and Bayesian methods in signal processing

All aspects related to the signal processing for architectural acoustics and noise control including imaging, source identification, characterization and active noise control in rooms and open spaces. Both theoretical and applied research are welcome

Most biological sounds, whether terrestrial or aquatic, are broad-band and transient in nature. This session will explore the various signal processing approaches employed by bio-acousticians and others to understand the context in which transient sounds are made, with a focus on sharing techniques across disciplines

Recent research exploring talkers' use of self-produced auditory information to guide speech production

Recent research on the development of phonetic perception, focusing on universal biases and experience-dependent perceptual changes that take place both in infancy and throughout life, including speculation about underlying mechanisms and processes

Contributions on theoretical and computational analysis of new metamaterial structures, experimental validation, characterization of prototype unit cells or bulk materials, and applied demonstrations.

Investigation of additive manufacturing for acoustic and vibration applications, including scaled, multi-materials, and other complicated structures fabricated from plastics, metals, etc.

Exploration of novel computational techniques along with extensions of existing methods, for the modeling of acoustic-structure interaction problems that fall in the mid-frequency range

This session focuses on analytical, computational, and/or experimental investigations into the generation of sound and/or structural vibration with steady or unsteady fluid flow-related origins

This session focuses on a diverse range of innovative concepts for enhancing damping and energy dissipation in structures

## **STRUCTURAL ACOUSTICS AND VIBRATION (SA) (continued)**

Treatment Methods and Computational Analysis of Vehicles  
(Joint with: Computational Acoustics, Engineering, Noise)  
Organized by: Benjamin M. Shafer, Michael T. Rose

## **UNDERWATER ACOUSTICS (UW)**

Comprehensive Nuclear-Test-Ban Treaty International Monitoring  
System: A Global Sensor Network with Scientific and Civil  
Applications in Hydroacoustics  
(Joint with: Acoustical Oceanography, Signal Processing in Acoustics)  
Organized by: Peter Loring Nielsen, David L. Bradley, Mario  
Zampolli, Georgios Haralabus

Ship Source Level Estimation: Methods and Measurements  
(Joint with: Animal Bioacoustics)  
Organized by: Dag Tollefsen, David P. Knobles, David Hannay

## **DESCRIPTIVE SENTENCES**

Explores the various modern methods of assessing, predicting, and treating sound and vibration in vehicles

The CTBT's IMS consists of a network of different sensor technologies designed to detect nuclear explosions worldwide. This session provides an overview of the IMS and its utilization to study regional and global physical hydroacoustic phenomena, including ocean basin and global-scale propagation, wave conversion, earthquake source mechanisms, three-dimensional underwater acoustic propagation marine mammal acoustics, ocean ambient noise, and Antarctic underwater acoustics

Estimation of ship source levels from acoustic sensor data in shallow water environments, including measurement techniques and analysis of recent data sets

# **OTHER TECHNICAL EVENTS AND INFORMATION**

## **ULTRASOUND MODELING WORKSHOP**

A 3-hour hands-on workshop using an HITU SIMULATOR will be offered at the San Diego ASA meeting on Monday morning, 2 December. This workshop is sponsored by the Biomedical Acoustics Technical Committee and will be available to all who are interested. There is no fee to participate, however, you are asked to register online or use the printed registration form on page 23 at the time you register for the meeting.

## **HOT TOPICS**

A "Hot Topics" session sponsored by the Tutorials, Short Courses, and Hot Topics Committee will cover the fields of Education in Acoustics, Acoustical Oceanography, and Speech Communication.

## **EXHIBIT**

An instrument and equipment exhibition will be located near the registration area and meeting rooms and will open on Monday, 2 December, with an evening reception serving lite snacks and a complimentary drink. Exhibit hours are Monday, 2 December, 5:30 p.m. to 7:00 p.m., Tuesday, 3 December, 9:00 a.m. to 5:00 p.m., and Wednesday, 4 December, 9:00 a.m. to 12:00 noon.

The Exhibit will include computer-based instrumentation, scientific books, sound level meters, sound intensity systems, signal processing systems, devices for noise control and acoustical materials, active noise control systems, and other exhibits on acoustics.

Contact the Exhibit Manager for information about participating in the exhibit: Dan Cooke, Director of Advertising and Exhibit Sales, AIP Publishing, LLC, 1305 Walt Whitman Road, Suite 300, Melville, NY 11747-4300, Tel: 516-576-2629; E-mail: dcooke@aip.org.