MONDAY - November 16

11:00 - 12:15 — Welcome to NC20 and Plenary by Dr. Lily Wang, University of Nebraska - Lincoln: The Acoustic Experience in Restaurants

12:15 - 13:00 — Break

Building Acoustics - Case Studies 1
Chairpersons: Greg Coudriet, Chris Springthorpe

13:00 - 13:20	526	1.1.1.1	An Integrated Approach to the Sound Isolation of a Fitness Center
13:20 - 13:40	621	1.1.1.2	Fitness Activities Noise Impact in High Rise Buildings
13:40 - 14:00	375	1.1.1.3	Case Studies in Fitness Center Noise and Vibration with Adjacent Residential or Commercial Space
14:00 - 14:20	309	1.1.1.4	Conversion and Compliance

Highway Noise
Chairpersons: Paul Donavan, Dana Lodico

13:00 - 13:20	507	1.1.2.1	Noise Modeling of Short Safety Barriers Using Realistic Vehicle Source Height Distributions
13:20 - 13:40	551	1.1.2.2	Public Involvement Tools for Visualizing and Hearing Transportation Noise
13:40 - 14:00	585	1.1.2.3	Consideration of Photovoltaic Systems as an Alternative Approach to Meeting Regulatory Requirements for Noise Abatement Measures
14:00 - 14:20	549	1.1.2.4	NCHRP 791 - Structure-borne Noise Case Study I-205

Education and Student Classic Paper Competition 1
Chairpersons: Andrew Barnard, Patricia Davlew, David Herrin

13:00 - 13:20	378	1.1.3.1	Leveraging ABET Accreditation to Promote Inclusion of Noise Control Engineering Concepts in Engineering Programs
13:20 - 13:40	639	1.1.3.2	Overview of Lyon, R.H.'s 1971 paper on Analysis of sound-structure interaction by theory and experiment."
13:40 - 14:00	593	1.1.3.3	Overview of Lyon's 1963 JASA paper on noise reduction of rectangular enclosures with one flexible wall
14:00 - 14:20	598	1.1.3.4	Overview of Richard H. Lyon's 1971 paper on analysis of sound-structure interaction by theory and experiment

Beamforming, Holography, and Active Noise Control
Chairpersons: J. Stuart Bolton, Jianxiong Feng

13:00 - 13:20	622	1.1.4.1	Improved Wideband Holography Algorithm for Rotating Sound Source Localization
13:20 - 13:40	611	1.1.4.2	Application of a Virtual Rotating Array for Near-field Localization of Rotating Sound Sources
13:40 - 14:00	592	1.1.4.3	Retrofit of a conventional beamforming array with a rotating sensor arm for multireference, continuous-scan beamforming
14:00 - 14:20	425	1.1.4.4	Singular Vector Filtering Method for Disturbance Enhancement Mitigation in Active Noise Control Systems

14:20 - 15:00 — Break

Building Acoustics - Case Studies 2
Chairpersons: Melinda Miller, Roderick Mackenzie

15:00 - 15:20	438	1.2.1.1	Case Study: Floating Jack-Up Slabs for Multi-Story Cinema in Manhattan
15:20 - 15:40	556	1.2.1.2	Flanking Sound Transmission Via Conjoined Fenestration in Buildings
15:40 - 16:00	620	1.2.1.3	Pool Equipment Mechanical Noise Impact
16:00 - 16:20			

Tire/Pavement Noise
Chairpersons: Kiran Patil, Peng Wang

15:00 - 15:20	317	1.2.2.1	Low noise poroelastic road pavements base on modified asphalt binder
15:20 - 15:40	344	1.2.2.2	Tone Characteristics of Tire-Pavement Interaction Noise due to Pavement Distress
15:40 - 16:00	440	1.2.2.3	An Artificial Neural Network-based Tool for Prediction of Tire-Pavement Interaction Noise
16:00 - 16:20	642	1.2.2.4	The Effectiveness of Quieter Pavement in Reducing Traffic Noise in the Presence of Other Noise Abatement Features

Student Classic Paper Competition 2
Chairpersons: Andrew Barnard, Patricia Daview, David Herrin

15:00 - 15:20	641	1.2.3.1	Overview of M. G. Prasad's 1983 paper on Acoustical Studies on Louver-Type Orifices
15:20 - 15:40	524	1.2.3.2	Overview of Challis, V.R., Prasad, M.G., Shi, Y., and Fisher, F.T.'s 2008 Paper on A Vibration Energy Harvesting Device with Bidirectional Resonance Frequency Tenability
15:40 - 16:00	595	1.2.3.3	Overview of Prasad's 1987 paper on a four load method for evaluation of acoustical source impedance in a duct
16:00 - 16:20	640	1.2.3.4	Overview of Ver, I. L. 1974 paper on Measurement of Dynamic Stiffness and Loss Factor of Elastic Mounts as a Function of Frequency and Static Load

Modeling 1
Chairpersons: Wen Li, Chad Musser

15:00 - 15:20	347	1.2.4.1	Analytical Modeling of a Resilient Particle Impact Damper on a Simply Supported Plate
15:20 - 15:40	565	1.2.4.2	SEA model of coupled structures by means of periodic Finite Element models of the subsystems
15:40 - 16:00	560	1.2.4.3	Noise Control Treatments Modeling by means of a Generalized Transfer Matrix Method
16:00 - 16:20			

16:20 - 17:00 — Break

17:00 - 18:00 — Career Development Forum

Tuesday - November 17

11:00 - 11:45 — INCE-USA General Meeting

11:45 - 12:15 — Board Certification Information and Networking Meeting

12:15 - 13:00 — Break

Building Acoustics - Codes, Standards and Guidelines 1
Chairpersons: Jeanette Hesedahl, Ted Pyper

13:00 - 13:20	442	2.1.1.1	An Overview of the Draft ASTM Heavy/Hard Object Field Impact Test Standard
13:20 - 13:40	489	2.1.1.2	Reconsidering the '8-dB rule' in ASTM Impact and Airborne Ratings
13:40 - 14:00	635	2.1.1.3	Variation in Single Number Ratings Due to Tapping Machine Location
14:00 - 14:20			

Tire Noise - Vehicle Interior
Chairpersons: Paul Donavan, Tan Li

13:00 - 13:20	583	2.1.2.1	Road Induced Interior Noise: Use of OTPA to Determine Tire Contribution and Vehicle Sensitivity
13:20 - 13:40	386	2.1.2.2	Prediction of Split in Fundamental Air-Cavity Mode of Loaded Tires based on Experimental Observations and Computational Simulations
13:40 - 14:00	280	2.1.2.3	Pavement Texture Analysis and Correlation with Tire Noise
14:00 - 14:20			

Community/Industrial Noise 1
Chairpersons: Jacob Poling, Clinton Cyr

13:00 - 13:20	470	2.1.3.1	Noise Assessment and Control for Transit Tunnel Emergency Ventilation Systems
13:20 - 13:40	444	2.1.3.2	Noise Survey and Predictive Noise Modeling of an Industrial Facility
13:40 - 14:00	521	2.1.3.3	Impact Pile Driving Noise Propagation
14:00 - 14:20	416	2.1.3.4	Power Plant Noise Control: Ordinances, Modeling, Construction, Monitoring, and Startup

Modeling 2
Chairpersons: Wen Li, Chad Musser

13:00 - 13:20	616	2.1.4.1	Prediction and verification of sound diffraction effects using ray tracing.
13:20 - 13:40	566	2.1.4.2	Modeling Launch Vehicle Liftoff Acoustics with Ray Tracing
13:40 - 14:00	454	2.1.4.3	Prediction of exterior noise propagation from powertrain and exhaust locations in a combine harvester.
14:00 - 14:20			

14:20 - 15:00 — Break

Building Acoustics - Codes, Standards and Guidelines 2
Chairpersons: Greg Coudriet, Jeff Fullerton

15:00 - 15:20	505	2.2.1.1	Duct Liner Specification Improvement
15:20 - 15:40	555	2.2.1.2	Casing Radiated Treatment on Air Terminal Units Based on ASHRAE-130 Test Procedures
15:40 - 16:00	441	2.2.1.3	Discussion of Building Codes and Measurement Accuracy in Architectural Acoustics, Transmission Loss Measurements
16:00 - 16:20			

Vehicle Aerodynamic Noise
Chairpersons: Gordon Ebbitt, Daniel Carr

15:00 - 15:20	531	2.2.2.1	Improving Underbody Wind Noise Transmission of Electric Vehicles using Simulation
15:20 - 15:40	548	2.2.2.2	A Computational Approach to Assess Design Impact on Wind Noise for Heavy Trucks
15:40 - 16:00	353	2.2.2.3	An Investigation of People's Responses to Automobile Wind Noise with Gusts
16:00 - 16:20			

Community/Industrial Noise 2
Chairpersons: James Barnes, Clinton Cyr

15:00 - 15:20	406	2.2.3.1	Combined Heat and Power Project - A Community Noise Case Study
15:20 - 15:40	571	2.2.3.2	Sampling of Tonal Noise Issues in Communities
15:40 - 16:00	356	2.2.3.3	Electrical Substation Noise Control
16:00 - 16:20	430	2.2.3.4	Comparison of Community Noise Management Methods between Shanghai City and New York City

Passive Noise Control - Damping and Decoupling
Chairpersons: Pranab Saha, Yutong Xue

15:00 - 15:20	315	2.2.4.1	Application of Passive Solutions to Micro Vibration Mitigation in Space Applications
15:20 - 15:40	633	2.2.4.2	Application of CLD for reduction of structure-borne noise in electronic enclosures
15:40 - 16:00	320	2.2.4.3	Acoustic Patch Panels Addressing Structure Borne Issues in Vehicles
16:00 - 16:20	518	2.2.4.4	Characterization of GFR Polyamide 66 Materials for NVH Applications

16:20 - 17:00 — Break

17:00 - 18:00 — INCE-USA Professional Awards

Wednesday - November 18

11:00 - 12:15 — Nora Keegan: Hand Dryer Noise

12:15 - 13:00 — Break

Building Acoustics - Unique Applications
Chairpersons: Melinda Miller, Chris Springthorpe

13:00 - 13:20	561	3.1.1.1	Wind-Induced Noise in High-Rise Residential Buildings
13:20 - 13:40	562	3.1.1.2	Data acquisition and the IoT (internet of things) movement: A use case for investigating post construction noise anomalies
13:40 - 14:00	287	3.1.1.3	Mass Timber Acoustics Design: A Solved Challenge?
14:00 - 14:20	452	3.1.1.4	Open office acoustics in mass timber construction

Acoustic Vehicle Alerting Sounds (AVAS)
Chairpersons: Steve Sorenson, Gordon Ebbitt

13:00 - 13:20	594	3.1.2.1	Engineering Process for the Development, Validation and Homologation of the Acoustic Vehicle Alerting System for Electric Vehicles
13:20 - 13:40	546	3.1.2.2	Effects of the AVAS regulation on the noise emission of battery electric vehicles
13:40 - 14:00	591	3.1.2.3	Influence of Secondary Tasks on Detection of Acoustic Vehicle Alert Systems
14:00 - 14:20	491	3.1.3.4	Not-So-Quiet Natural Nighttime Noise

Community/Industrial Noise 3
Chairpersons: Michael Sneere, Mark Storm

13:00 - 13:20	341	3.1.3.1	Why Environmental Noise Should Be Treated as a Pollutant
13:20 - 13:40	366	3.1.3.2	Warehouse/Distribution Center Noise: A Growing Concern
13:40 - 14:00	418	3.1.3.3	Assessing noise sources in an urban environment
14:00 - 14:20	576	3.1.4.4	Design of Acoustic Metaclusters for Sound Control

Passive Noise Control - New Generation Materials 1
Chairpersons: J. Stuart Bolton, Yutong Xue

13:00 - 13:20	615	3.1.4.1	Acoustic Properties of Open-Celled Metal Foams with a Step-Wise Pore Size Gradients
13:20 - 13:40	302	3.1.4.2	Low Frequency Absorption Enhancement by Modification of Poro-Elastic Layered Sound Package
13:40 - 14:00	420	3.1.4.3	Design and 3D Printing of Aerogel-based Ultra-lightweight Sound Absorbers
14:00 - 14:20	452	3.1.1.4	Open office acoustics in mass timber construction

14:20 - 15:00 — Break

Building Acoustics - HVAC Noise and Vibration
Chairpersons: Jeanette Hesedahl, Jeff Fullerton

15:00 - 15:20	480	3.2.1.1	Sound Power Measurements using Sound Intensity for HVAC Applications
15:20 - 15:40	609	3.2.1.2	Noise Generated by Stiffening Rods in a Flat Oval HVAC Duct
15:40 - 16:00	559	3.2.1.3	Case History: Testing of Acoustical Curtain Enclosures per AHRI-585 used with Water Cooled Rotary Screw Chillers
16:00 - 16:20	405	3.2.1.4	Surge Frequency in Steel Coil Springs used for Building Acoustics

Automotive NVH
Chairpersons: Rabah Hadjit, Farokh Kavarana

15:00 - 15:20	473	3.2.2.1	Instrumentation Requirements for Using Multiple Coherence to Enhance Vehicle Sound Detection During Electric Vehicle Minimum Noise Testing
15:20 - 15:40	328	3.2.2.2	Prediction of NVH performance for Electric Vehicle Drivetrain Based on Multiphysics Simulation
15:40 - 16:00	459	3.2.2.3	Comprehensive Automotive Active Sound Design
16:00 - 16:20	486	3.2.2.4	Hood Flutter Measurement & Perception

Renewable Energy Source Noise
Chairpersons: Ken Kaliski, Rob O'Neal

15:00 - 15:20	477	3.2.3.1	Wind Farm Environmental Noise and Vibration Impact Analyses: Background Sound, Project Construction, and Assessment of Operational
15:20 - 15:40	532	3.2.3.2	An Overview of Sound from Commercial Photovoltaic Facilities
15:40 - 16:00	535	3.2.3.3	Noise evaluations of solar energy facilities
16:00 - 16:20			

Passive Noise Control - New Generation Materials 2
Chairpersons: J. Stuart Bolton, Xiaoshi Su

15:00 - 15:20	574	3.2.4.1	Experimental Acoustic Characterization of Silica Nanoparticle-Impregnated Kevlar Fabric
15:20 - 15:40	572	3.2.4.2	Influence of Sample Thickness, Spacing and Membrane Interaction on the Acoustic Performance of Carbon Graphite Foams
15:40 - 16:00	393	3.2.4.3	Fractional Calculus Models for Simulating the Reflection of Sound Waves in Ducts with Acoustic Black Hole Terminations
16:00 - 16:20	515	3.2.4.4	Achieving Efficient Mode Coalescence in Metasurface-lined Acoustic Waveguides

16:20 - 17:00 — Break

17:00 - 18:00 — Women In Noise Control Engineering

Thursday - November 19

11:00 - 12:15 — Plenary by Dr. Juliette Ioup, Universay of New Orleans: Underwater Acoustic Noise Effects on Marine Mammals in the Northern Gulf of Mexico

12:15 - 13:00 — Break

Piping and Hydraulic System Noise
Chairpersons: Mandy Kachur, Jeanette Hesedahl

13:00 - 13:20	626	4.1.1.1	Investigating Piping Acoustic Induced Vibration Problems and Current Assessment Methods to Evaluate Fatigue Life
13:20 - 13:40	357	4.1.1.2	Performance of an in-line syntactic-foam device for control of water hammer and fluid-borne noise
13:40 - 14:00	451	4.1.1.3	Hydraulic Hose Modal Behavior to Investigate Structure-Borne Energy Transfer
14:00 - 14:20	467	4.1.1.4	Acoustic Results of Application of Large Diameter Flexible Piping Connections on High Pressure Centrifugal Pumps

Underwater Vessel Noise Impacts to Marine Life – A Global Issue: Sonic Sea Documentary Viewing and Panel Discussion
Chairperson: Mike Bahtiarian

Tutorial on Sound Level Meters, Part 1
Chairpersons: Andrew Barnard, Tyler Dare

13:00 - 13:20	466	4.1.3.1	Tutorial on Sound Level Meters: Introduction to Sound Level Meters and Measurement Parameters
13:20 - 13:40	290	4.1.3.2	Tutorial on Sound Level Meters: Choosing a Sound Level Meter
13:40 - 14:00	514	4.1.3.3	Tutorial on Sound Level Meters: Practical Tips on Use
14:00 - 14:20			

Passive Noise Control - New Generation Materials 3, Muffler and Silencers
Chairpersons: J. Stuart Bolton, Xiaoshi Su

13:00 - 13:20	573	4.1.4.1	Performance of a modified double expansion chamber muffler inspired by Acoustic Black Hole theory
13:20 - 13:40	448	4.1.4.2	Overview of Low Frequency Resonators Based on LEONAR Design
13:40 - 14:00	422	4.1.4.3	Gunshot Suppressors and Sound Level Meters dBZ Peak Performance Tests
14:00 - 14:20	575	4.1.4.4	Perfect Absorption in Duct by Coupling Helmholtz Resonators

14:20 - 15:00 — Break

Underwater and Maritime
Chairpersons: Allan Beaudry, Joe Smullin

15:00 - 15:20	424	4.2.2.1	Protecting Aquarium Sea Mammals and Fish from Pile Driving Noise and Vibration
15:20 - 15:40	380	4.2.2.2	Sound Transmission Regulations and Testing on Marine Vessels
15:40 - 16:00	485	4.2.2.3	SNAME Procedures for Evaluating the Transmission of Structure Borne Noise
16:00 - 16:20			

Tutorial on Sound Level Meters, Part 2
Chairpersons: Andrew Barnard, Tyler Dare

15:00 - 15:20	439	4.2.3.1	Tutorial on Sound Level Meters: Tips for making standardized measurements with a sound level meter
15:20 - 15:40	445	4.2.3.2	Tutorial on Sound Level Meters: Conducting a noise survey with an SLM
15:40 - 16:00	536	4.2.3.3	What Can "Go Wrong" in Acoustic Measurements: Common Errors, Hardware Failures and Mistakes.
16:00 - 16:20			

MG Prasad Memorial Session
Chairs: David Herrin, Prakash Thawani, Patrick Marks, Rajavel Balaguru

15:00 - 15:20	547	4.2.4.1	An Appreciation of the Exhaust System Research of Prasad and Crocker
15:20 - 15:40			
15:40 - 16:00			
16:00 - 16:20			

16:20 - 17:00 — Break

17:00 - 18:00 — Student Awards

Friday - November 20

11:00 - 12:15 — Technical Activity Committee Meetings

12:15 - 13:00 — Break

Standards, Noise Policies and Regulations
Chairpersons: Paul Burge, Gordon Ebbitt

13:00 - 13:20	458	5.1.1.1	Measuring In-Situ Sound Power Using a Simplified Acoustic Energy Density Method
13:20 - 13:40	538	5.1.1.2	What Defines a Sound Level Meter in the US has Changed. ANSI/ASA S1.4 equals IEC 61672. Understanding the Differences
13:40 - 14:00	618	5.1.1.3	Proposed operator positions for rack-mounted equipment measurements in ECMA-74
14:00 - 14:20			

Sound Quality
Chairpersons: Patricia Davies, Shashikant More, Daniel Carr

13:00 - 13:20	373	5.1.2.1	Promoting a Quiet Revolution through Product Noise Control
13:20 - 13:40	552	5.1.2.2	Automotive Door Closure Sound Quality: Model, Target Definition and Identification of Countermeasure for Performance Improvement
13:40 - 14:00	345	5.1.2.3	Dishwasher sound quality consumer study with factorial treatment of background variables
14:00 - 14:20	544	5.1.2.4	Interactive Sound Quality Evaluation of an EV Virtual Prototype

Noise Control Tutorials and Tools
Chairpersons: Andrew Barnard, Tyler Dare

13:00 - 13:20	361	5.1.3.1	Hearing Conservation Program Best Practices for Noise Control Engineers
13:20 - 13:40	599	5.1.3.2	A Simple Spreadsheet Tool for Noise Path Characterization
13:40 - 14:00	401	5.1.3.3	Elements of Uncertainty in the Prediction and Measurement of Airborne Sound
14:00 - 14:20			

Aerodynamic Noise Prediction 1
Chairpersons: Robert Powell, Kristin Cody

13:00 - 13:20	433	5.1.4.1	Automotive Aerodynamic Noise Prediction using Scale Resolved Stress-Blended Eddy Simulation
13:20 - 13:40	389	5.1.4.2	Aeroacoustics Noise Prediction of Low Mach Number Flow using Hybrid Wave Equation Model
13:40 - 14:00	398	5.1.4.3	Predicting Engine Noise with Computational Aero-Acoustics Model
14:00 - 14:20			

14:20 - 15:00 — Break

Product Noise Rating Workshop
Chairperson: Dana Lodico

15:00 - 15:20			
15:20 - 15:40			
15:40 - 16:00			
16:00 - 16:20			

Urban Air Mobility and Unmanned Aerial Vehicle Acoustics
Chairpersons: Greg Goetchius, Randolph Cabell

15:00 - 15:20	474	5.2.2.1	Anechoic Chamber Measurement of an Octocopter
15:20 - 15:40	607	5.2.2.2	Evaluation of embedded windshield resonators to reduce cabin noise of a UAM concept aircraft
15:40 - 16:00	632	5.2.2.3	Passenger acceptance of VTOLs for UAM
16:00 - 16:20			

Impact on Health
Chairpersons: Jim Thompson, David Herrin

15:00 - 15:20	483	5.2.3.1	Noise Exposure for Instructors in Cycling Studios
15:20 - 15:40	349	5.2.3.2	Integrating Point-of-View Video into Hearing Conservation Programs for Improved Outcomes
15:40 - 16:00	355	5.2.3.3	"Experimental Nonlinear Seat Suspension Characterization"
16:00 - 16:20	318	5.2.3.4	Degradation of Sailor Performance due to Noise and Vibration at their Berthing Quarters – A Review and Recommended Approach

Aerodynamic Noise Prediction 2
Chairpersons: Robert Powell, Kristin Cody

15:00 - 15:20	395	5.2.4.1	Numerical Simulation of Underhood Cooling Noise for Off-Highway Application
15:20 - 15:40	298	5.2.4.2	Noise Control Concept Verification for a Ducted Fan System
15:40 - 16:00	570	5.2.4.3	Numerical Modeling and Method of Air Bearing-based Vibration and Noise Mitigation
16:00 - 16:20			