

Track 1 --- Acoustics, Vibration, and Phononics

Description and Objectives:

Acoustics, Vibration, and Phononics - is organized by the Noise Control and Acoustics Division (NCAD) of the ASME. The Track contains a collection of Topics in the broad areas of acoustics, mechanical vibrations, and phononic metamaterials which are individually organized by leading researchers in the field. The Topics give a comprehensive coverage of experimental, computational, and analytical approaches employed to study problems of contemporary interest and importance in engineering acoustics, vibrations, and wave propagation. Contributions in the form of technical papers as well as oral presentation are sought in the individual Topics.

This track will bring together researchers from all over the world to share ideas and findings and expand international cooperation on all aspects of Acoustics, Vibration, and Phononics. Dissemination of knowledge by presenting research results, new developments, and novel concepts in Acoustics, Vibration, and Phononics will serve as the foundation upon which the conference program of this area will be developed.

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Sponsor:

Noise Control and Acoustics Division (NCAD)

Number of Topics: 15

Key Dates of IMECE 2021:

- March 09, 2021 Deadline for submission of abstracts
- March 16, 2021 Notification of abstract acceptance
- April 23, 2021 Deadline for submission of full-length draft paper
- June 15, 2021 Notification of full-length draft paper acceptance/rejection
- July 02, 2021 Deadline for submission of revised full-length paper
- July 13, 2020 Deadline for submission of Technical Presentation only abstract
- July 13, 2021 Notification of acceptance/rejection of revised paper and Technical Presentation only abstract
- July 30, 2021 Submission of final paper and presenting author registration deadline

Topic 1: Phononic Crystals and Metamaterials

This symposium, which will be in its 17th year in 2021, will bring together researchers and engineers from universities, government laboratories, and industry to discuss research ideas and recent findings in Phononic Crystals and Acoustic/Elastic Metamaterials with applications in wave guidance, sound focusing, imaging, thermal transport, flow control, and noise/vibration control based on interferences, resonances, and possibly other phenomena. Topics solicited include, but are not limited to, elastic/acoustic wave propagation phenomena such as band-gap formation, waveguides, negative refraction, effects of nonlinearity/damping, band-structure computation, homogenization, topological and non-reciprocal phononics, flow control, and nanoscale thermal transport.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Mahmoud Hussein

Mostafa Nouh

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Sponsor:

Phononic Crystals and Metamaterials TC of NCAD

Topic 2: General

This General topic area invites papers and presentations on any analytical, numerical, and experimental research and development in the general field of vibration, sound, and wave phenomenon that are not covered by other topic areas within the Acoustics, Vibration, and Phononics track. Topics include, but are not limited to, ocean acoustics, linear and nonlinear acoustics and vibration, thermoacoustics, stochastic methods in vibration and acoustics, fluid-structural interaction, vibration and noise control, experimental methods in vibration and acoustics, and sensors and actuators. This topic area will give authors a great opportunity to reach a broad and international community at the IMECE conference and gain new perspectives on their research.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Guoliang Huang	University of Missouri
Haijun Liu	Temple University
Weidong Zhu	University of Maryland, Baltimore County

Sponsor:

Structural Acoustics TC of NCAD

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Topic 3: Passive, Semi-Active, and Active Noise and Vibration Control

The Structural-Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a Symposium on Passive, Semi-Active, and Active Noise and Vibration Control. This symposium seeks research and application of airborne, fluid-borne, and structure-borne noise and vibration control methods through the use of passive, semi-active, and active techniques. Investigations may be experimental, theoretical, or numerical in nature and can address efforts to identify and control unwanted sound and vibration. Areas of interest include the reduction of low amplitude sound and vibration, the design of power dense actuators for active control applications, sound barriers, enclosures, mufflers, isolators, or more general work on vibration damping, or absorptive materials. Industrial experiences related to these areas are of particular interest.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Yousof Azizi Bridgestone Americas Technical Center

John C. Collinger Naval Nuclear Laboratory

Sponsor:

Structural Acoustics TC of NCAD

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Topic 4: Analytical and Computational Acoustics and Vibrations

The Structural-Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a Symposium on Analytical and Computational Acoustics and Vibrations. This symposium seeks research and application of computational methods to predict the vibroacoustic response of structures and fluids subjected to mechanical and acoustic excitations. Areas of interest include computational predictive methods for low, mid and high frequency regimes, model reduction methods, noise control feature modeling and methods for addressing uncertainties in the analysis (such as excitation, material, or geometric uncertainties). Experimental validation of proposed methods and practical applications to multi-disciplinary areas are especially of interest, such as in noise and vibration control, transportation, bio-medical, electro-mechanical products and energy production.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Joseph Blochberger JHU Applied Physics Laboratory
Weidong Zhu University of Maryland, Baltimore County

Sponsor:

Structural Acoustics TC of NCAD

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Topic 5: Structural-Acoustic System Identification

The Structural Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a symposium on Structural-Acoustic System Identification. The goal of this symposium is to provide a forum for exchange of current practices, research and developments, and future trends and directions in the board area of structural-acoustic system identification and its application in structural health monitoring and controls. This symposium will also foster cross-disciplinary interactions and collaborations to seek for cutting edge solutions that can improve current detection, diagnostic, and prognostic techniques used in many applications. Topics of interests include, but not limited to the following areas:

- Novel testing, signal processing, and identification techniques for source identification and localization and noise-path identification.
- Nondestructive evaluation of material properties and damage assessment based on acoustic and vibration approaches.
- Development and application of novel acoustic testing techniques, advanced diagnostic methods, and test facilities.
- Application of system identification techniques in vibration and noise control.
- Structural health monitoring with emphasis on novel design and implementation of sensors and actuators, signal processing, and performance enhancement.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Yanfeng Shen Shanghai Jiaotong University

Yongfeng Xu University of Cincinnati

Weidong Zhu University of Maryland - Baltimore Campus

Sponsor:

Structural Acoustics TC of NCAD

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Topic 6: Noise, Vibration and Harshness in Automotive Systems

The Structural Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a Symposium on Noise, Vibration and Harshness in Automotive Systems. This symposium is dedicated to noise, vibration and psychoacoustics, i.e. subjective/objective noise and vibration harshness, in automotive systems. The session is a platform for leading professionals from passenger and commercial vehicle industries as well as academia to meet and share their latest state-of-the art research and findings. This session covers various topics on automotive noise/vibration ranging from understanding the fundamentals of noise and vibration generation and propagation/transmission mechanisms in automotive systems to developing empirical and virtual models to predict noise and vibration in automotive systems. Studies on novel subsystems and materials developed for active and passive noise/vibration control can also be considered.

Different topics considered in this session include but not limited to:

- Experimental, numerical and analytical methods and techniques for studying noise/vibration generation
- Sound propagation and vibration transmission modeling and identification
- Passive and active noise/vibration control techniques in automotive systems
- Novel and cost-efficient lightweight noise/vibration control materials; e.g. hyperdampers, metamaterials, etc
- Energy harvesting in automotive systems
- Noise and vibration measurement techniques in automotive systems
- Ride comfort modeling and analysis and psychoacoustics
- Subjective and objective rating/evaluation of ride comfort and noise perception
- Automotive system level and subsystem level NVH simulation, e.g. FEA, aeroacoustics, vibroacoustics, CFD etc
- NVH for high performance cars, sports cars and electric vehicles

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizer:

Yousof Azizi Bridgestone Americas Technical Center

Sponsor:

Structural Acoustics TC of NCAD

Topic 7: Human Perception of Acoustics

The Noise Control and Acoustics Division (NCAD) is sponsoring a symposium on human perception of acoustics. This symposium is intended to bring together researchers and engineers from various disciplines to discuss ideas related to the scientific study of human perception of sound (e.g. loudness, noise, pitch, and source location), and how the study leads to enhanced fundamental understanding and/or improved engineered hearing devices/systems. Studies can be experimental, numerical, or theoretical in nature. Topics of interest include but are not limited to wave propagation in hearing animals and organs, auditory signal processing, noise detection, cancellation, and mitigation, sound localization and separation, speech recognition, and biomimetic hearing devices.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizer:

Haijun Liu Temple University

Sponsor:

Noise Control and Acoustics Division

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Topic 8: Vibration and Acoustic Measurements, Signal Processing, and Test Facilities

The Aero/Hydro Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a Symposium on Vibration and Acoustic Measurements, Signal Processing, and Test Facilities. This symposium is intended to bring together engineers and researchers from industry, government laboratories, and universities to discuss ideas related to measurement techniques, signal processing, and test facilities for flow-induced vibration and acoustics. Technical papers and presentations dealing with aspects of vibration and acoustics testing are invited. Topics include, but are not limited to, experimental methods and tools for measuring sound and vibration such as laser vibrometry and velocimetry, array-based techniques, acoustic holography, inverse methods, acoustic intensity, sensor development, anechoic and reverberant methods, wind and water tunnels, imaging and velocimetry, and modal methods. Papers and presentations on new developments in measurement techniques and facilities, even as applied to specific problems, are of special interest.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Bob Tomko Naval Nuclear Laboratory

Kristin Cody Naval Nuclear Laboratory

Matt Plutt Naval Nuclear Laboratory

Sponsor:

Aero/Hydro Acoustics TC of NCAD Yongfeng Xu

Track Chair:

University of Cincinnati xu2yf@uc.edu

Topic 9: Aero-acoustics and Sound Propagation

The Aero/Hydro Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a symposium on aero-acoustics and sound propagation. Areas of interest include: aero-acoustic source modeling and sound propagation in turbulent flow and turbulent boundary layer, effects of wind shear and vortical flow on sound propagation, aircraft noise propagation in the atmosphere, sonic boom, acoustic sensor performance under the outdoor environment, acoustic propagation at the interface of air and porous media, community noise, and noise annoyance and control. In addition, due to the recent resurging of alternative energy industry such as nuclear power plants and wind turbines, the related noise generation, propagation, and its environmental and health impacts are of a great interest to this symposium. The symposium seeks recent contributions of both basic and applied research in these areas. These studies may be experimental, theoretical, or numerical in nature. Industrial experiences related to these areas are also of interest.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Charlie Zheng	Utah State University
Michael Jonson	Pennsylvania State University

Sponsor:

Aero/Hydro Acoustics TC of NCAD

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Topic 10: Flow-Induced Noise and Vibration

The Aero/Hydro Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a Symposium on Flow Induced Noise and Vibration. The symposium seeks research and industry experiences on flow noise and vibration. Research studies may be experimental, theoretical, or numerical in nature and can address efforts to understand noise and vibration mechanisms and/or methods to control or reduce noise. Industrial experiences related to flow induced noise and vibration are also of particular interest. Areas of interest include noise and vibration caused by fluid flow, which may include basic research, applied research, theoretical studies from fluid flow, which can be from any type of fluid including air, water, steam, refrigerants, and gasses. Fields of study may include basic research or flow induced vibration from leakage flows, aircraft, power plants, automobiles, submersible vehicles, heat exchangers, valves, and internal or external discontinuities.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Bob Tomko Naval Nuclear Laboratory

Brent Paul Serco

Sponsor:

Aero/Hydro Acoustics TC of NCAD

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Topic 11: Turbomachinery Noise

The Aero/Hydro Acoustics Committee of the Noise Control and Acoustics Division (NCAD) is sponsoring a Symposium on Turbomachinery Noise. This focuses on a large segment of noise including jet, turbomachinery, propeller, pump, air and hydro turbines, and fans. Vehicles include all forms of air, land or sea transportation and commerce. Noise produced by all types of turbomachinery, e.g. centrifugal, mixed, and radial, are of interest. The symposium seeks basic and applied research contributions in these areas of flow noise. Research studies may be experimental, theoretical, or numerical in nature and can address efforts to understand noise mechanisms and/or methods to control or reduce noise. Industrial experiences related to these flow noise areas are also of particular interest.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Michael Jonson Pennsylvania State University

Brent Paul Serco

Sponsor:

Aero/Hydro Acoustics TC of NCAD

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Topic 12: Congress-Wide Symposium on NDE &SHM: Ultrasonic waves for material characterization and damage assessment.

The Noise Control and Acoustics Division (NCAD) and Nondestructive Diagnostics and Prognostics Division (NDPD) are co-sponsoring a congress-wide symposium on NDE & SHM. This specific topic of the symposium will focus on ultrasonic waves for material characterization and damage assessment. The Congress-Wide Symposium on NDE &SHM seeks research and application of ultrasonic waves to characterize materials and assess damage. Investigations may be theoretical, numerical and experimental in nature and can address efforts to conduct NDE and SHM. Topics of interest include but are not limited to NDE and SHM using ultrasonic waves, innovative instrumentation, signal processing, ultrasonic wave imaging, modeling and testing, composite materials damage assessment, industrial and biomedical applications.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Weidong Zhu University of Maryland, Baltimore County

Yongfeng Xu University of Cincinnati

Yanfeng Shen Shanghai Jiaotong University

Portia Banerjee NASA

Andrei Zagrai New Mexico Institute of Mining and Technology

Sponsors:

Noise Control and Acoustics Division

Nondestructive Diagnostics and Prognostics Division

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Topic 13: Congress-Wide Symposium on NDE & SHM: Computational nondestructive evaluation and structural health monitoring.

The Noise Control and Acoustics Division (NCAD) and Nondestructive Diagnostics and Prognostics Division (NDPD) are co-sponsoring a congress-wide symposium on NDE & SHM. This particular topic of the symposium is dedicated to computational nondestructive evaluation and structural health monitoring. Contributions on any aspect of computational NDE and SHM are welcomed, which includes analytical and numerical modeling, digital twins, correlation of models to experimental data, development of new computational methodologies, stability of models and many others. This topic in the Congress-wide Symposium on NDE & SHM, will provide a venue for communication, discussion, and dissemination of ideas, advancements, and opinions on subjects related to computational NDE, SHM and prognosis.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Weidong Zhu University of Maryland, Baltimore County

Yongfeng Xu University of Cincinnati

Yanfeng Shen Shanghai Jiaotong University

Portia Banerjee NASA

Andrei Zagrai New Mexico Institute of Mining and Technology

Sponsors:

Noise Control and Acoustics Division

Nondestructive Diagnostics and Prognostics Division

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Topic 14: Wave propagation in heterogenous and architected media

The study of stress wave propagation is very significant in aerospace, automotive, biomedical and electrical engineering. The understanding of the interaction between an elastic wave and a heterogenous or architected medium is an important problem in various applications, such as wave control, energy harvesting or biomedical ultrasound. This session has the aim of gathering experts and share knowledge in the fields of theoretical modelling, numerical simulation and experiments, application of developed methods to study stress wave propagation, novel designs of materials and structures are welcome. The session will focus on research dealing with (1) composites with microstructures; (2) complex metamaterials; (3) biological tissues; (4) soil and rocks; (5) soft materials. Contributions on the following topics are welcome : (i) mathematical models and architecture continua; (ii) local and non-local modelling of multiphase and multiphysics media; (iii) numerical techniques applied to scattering problems; (iv) multiscale modelling and experimental validation of generalised continua; (v) inverse microstructure problems.

NCAD is also sponsoring a “Best Student Paper Award”. The winners will be announced at NCAD’s General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Guoliang Huang University of Missouri

Hussein Nassar University of Missouri

Sponsor:

Structural Acoustics TC of NCAD

Track Chair:

Yongfeng Xu University of Cincinnati xu2yf@uc.edu

Topic 15: Dynamics of adaptive engineering structures and materials

In order to meet the requirements of tomorrow's world, engineers and architects must design extremely efficient structures. Making engineering structures and materials adaptive is a promising approach to reach that target. The load carrying efficiency of structures and materials can be increased noticeably by the employment of sensors, actuators and control units through multiphysics approach. Hence, the active manipulation of the static and dynamic structural response (i.e. forces, deformations and vibrations) enables to reduce the mass of engineering structures dramatically and to increase their performance. Additionally the adjustment to changing requirements occurring during lifetime of aerospace structures and building, like deployable and retractable structures, with significant changes between the configurations is another application of adaptive structures. This mini-symposium focuses on the adaptivity of structures in aerospace and civil engineering and on load carrying structures in general. It is devoted to new approaches in the computational design, analysis and optimization of such structures including (but not limited to):

- modelling and simulation
- form finding and optimization
- optimal strategies for sensor and actuator placement
- active and passive control strategies
- criteria for the evaluation of adaptive engineering structures.

NCAD is also sponsoring a "Best Student Paper Award". The winners will be announced at NCAD's General Committee Meeting at the IMECE Conference (Time to be announced in the final program). The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in the competition, the primary author of the paper must be a student and must present at the conference. To participate, please send an e-mail to Guoliang Huang (huangg@missouri.edu) with the following information no later than August 31st, 2021: (1) Student Name and Affiliation, (2) IMECE2021 Paper #, and (3) Advisor Name. Note that an advisor is allowed to nominate no more than one paper for the competition.

Organizers:

Guoliang Huang
Yangyang Chen

Track Chair:

Yongfeng Xu

University of Cincinnati

xu2yf@uc.edu

Sponsor:

Structural Acoustics TC of NCAD