



IN THIS ISSUE

Report from the Chair

Mostafa Nouh

Welcome to the 2021 ASME Noise Control and Acoustics Division (NCAD) newsletter. It is safe to say that last year was unique in many ways. Nonetheless, NCAD continued to promote the development and applications of acoustic principles, encourage the exchange of ideas through technical meetings and publications, and to acknowledge exceptional achievements within the acoustics and noise control field. The ongoing Covid pandemic presented several challenges including a transition of NCAD's major event, the ASME International Mechanical Engineering Congress and Exposition (IMECE), to a virtual/online format. NCAD organized its annual technical track (Track 1: Acoustics, Vibration, and Phononics) which continued to be one of the biggest and best attended tracks of the event. Despite the lack of in-person interactions, and the challenges posed by different time zones, the NCAD track at the 2020 IMECE was very successful with 7 full technical sessions and 44 presentations, which were presented via the IMECE online platform and followed by live Q&A sessions where the authors were able to virtually interact with the NCAD community. I would like to thank Haijun Liu who did a tremendous job as track chair, as well as Yongfeng Xu and Weidong Zhu for serving as track co-chairs, and many current and former NCAD group leadership team members and volunteers for organizing the different topics and symposia.



At the 2020 IMECE, Prof. Kon-Well Wang, Stephen P. Timoshenko Collegiate Professor of Mechanical Engineering at the University of Michigan, received the Rayleigh Lecture Award. Prof. Wang is a renowned professor who has done extensive research in the areas of acoustics, smart and adaptive materials for vibration and sound control, bio-inspired structures, origami dynamics, as well as multi-stable metastructures and metamaterials. Among his many notable awards and recognitions are the SPIE Smart Structures and Materials Lifetime Achievement and the ASME N.O. Myklestad awards. Prof. Wang gave an excellent Rayleigh Lecture under the title "Vibration and Noise Control Harnessing Reconfigurable Modular Metastructures," where he presented ideas related to creating engineered materials and structures from synergistically assembling and controlling metastable modules and uncovering their mechanics and nonlinear dynamics behaviors due to meta- and multi-stability.



Rayleigh Lecturer Prof. Kon-Well Wang (left) and NCAD Plenary Speaker Prof. Andrea Alù (right)

NCAD also had the pleasure of hosting Prof. Andrea Alù, Einstein Professor of Physics and Professor of Electrical Engineering at the City College of New York (CUNY) and the founding director of the CUNY Photonics Initiative, who gave the track's plenary talk. Prof. Alù is a Fellow of NAI, IEEE, AAAS, OSA, SPIE and APS, and has received several scientific awards, including the IEEE Kiyo Tomiyasu Award, the Vannevar Bush Faculty Fellowship from DoD, the ICO Prize in Optics, the NSF Alan T. Waterman award, the OSA Adolph Lomb Medal, and the URSI Issac Koga Gold Medal. Prof. Alù gave a very exciting talk on "Exotic Wave-Matter Interactions in Metamaterials Based on Broken Symmetries," where he discussed his recent research activity in acoustics exploring tailored and intelligently arranged meta-atoms forming acoustic metamaterials that provide exciting venues to realize new mechanical phenomena and devices. Abstracts of the two presentations can be found in this newsletter as well as the [NCAD website](#).

The NCAD Best Student Paper Competition was also held at the 2020 IMECE. The purpose of the competition is to encourage participation of student researchers in Acoustics, Vibration, and Phononics and to introduce NCAD and ASME to the acoustics engineers of the future. The winners of the best student papers are indicated in this newsletter. I would like to thank Yongfeng Xu for organizing the competition and all the judges for their effort and time. Furthermore, Prof. J. Stuart Bolton,



Professor of Mechanical Engineering at Purdue University, received the 2020 Per Bruel Gold Medal for Noise Control and Acoustics in recognition of his seminal and far-reaching contributions to the field of acoustics and noise control engineering through research, education, service to the technical community and industrial engagement. Since joining the faculty at Purdue in 1984, Prof. Bolton has maintained an active research program at the Ray W. Herrick Laboratories, and has published more than 100 archival journal articles, 200 conference presentations and supervised more than 100 students.

There have been some changes in the NCAD leadership during the past year. Albert Kirwan completed his rotation through the executive committee in June 2020. On behalf of NCAD, I would like to sincerely thank Albert for his many years of dedication service to the division. Prof. Guoliang Huang, James C. Dowell Professor in the Department of Mechanical and Aerospace Engineering at the University of Missouri, was selected to join the executive committee as a member-at-large and start a 5-year term on the leadership team. Yousof Azizi was selected to fill Prof. Huang's former role, and become the chair of the Structural Acoustics Technical Committee. Brent Paul's many years of preparing the division's newsletter came to an end. I would like to thank Brent for his efforts throughout the years and for continuing to serve as NCAD's web page and social media administrator. I also want to thank Albert Kirwan for graciously assuming Brent's role as the newsletter editor starting with this one.

Our primary membership and division finances remain stable. NCAD continues to provide recognitions and awards. We will participate at the 2021 IMECE which will continue to be held in a virtual environment. NCAD will again organize its annual technical track on Acoustics, Vibration, and Phononics. More information on the 2021 IMECE is provided in this newsletter. We are currently soliciting papers in this track; so please submit your abstracts by March 9, 2020. Traditional NCAD conference activities such as the Rayleigh lecture, NCAD track plenary, student paper competition, committee meetings, and a

virtual awards ceremony will take place at the 2021 IMECE. This year, Yongfeng Xu will be the technical track chair and Guoliang Huang will organize and the NCAD Best Student Paper competition. We are very pleased to announce that Dr. Stephen Hambric from ARL and Penn State University will give the 2021 Rayleigh Lecture. Dr. Hambric is a world-renowned expert in structural acoustics and flow-induced noise and vibrations, as well as an active member of the NCAD community. We very much look forward to his lecture during this year's IMECE conference.

Last year also marked the formation of the *ASME Journal of Vibration and Acoustics* best paper award, which will be given annually as a co-sponsored award by NCAD and the Technical Committee on Vibration and Sound (TCVS) within the Design Engineering Division. The 2020 award winners will be announced soon through both divisions and the winning paper will also be recognized at the NCAD virtual awards event in the 2021 IMECE conference.

Finally, as division chair, I would like to thank all other volunteers who have contributed to NCAD over the past year. If you have any questions and suggestions, or would like to be more involved in division activities, please feel free to email us at NCAD@asme.org.

Report from ASME IMECE 2020

Haijun Liu

The 2020 ASME International Mechanical Engineering Congress and Exposition (IMECE) was held virtually from November 16 to 19 due to the COVID-19 pandemic. The Noise Control and Acoustic Division (NCAD) was happy to organize Track 1: Acoustics, Vibration, and Phononics. The technical track brought together engineers and researchers from industry, universities, and government laboratories to discuss recent contributions in acoustic metamaterials, noise control, structural vibrations, signal processing, instrumentation, flow-induced noise, turbomachinery, phononic crystals, as well as structural health monitoring. The track included five major topics with seven technical sessions distributed throughout Monday and Tuesday of the conference week. The track hosted a total of 44 technical presentations and 41 technical papers (some of which were also presented at the conference). The major topics and a breakdown of the number of talks in each topic are provided below:

- Phononic Crystals and Metamaterials: 3 sessions and 18 presentations.
- General: 1 session and 6 presentations
- Passive, Semi-Active, and Active Noise Control: 1 session and 6 presentations.
- Noise, Vibration and Harshness in Automotive Systems: 1 session and 6 presentations.
- Human Perception of Acoustics & Vibration and Acoustic Measurements: 1 session and 6 presentations.
- Plenary Lecture: "Exotic Wave-Matter Interactions in Metamaterials Based on Broken Symmetries", Prof. Andrea Alù, City University of New York (CUNY).
- Rayleigh Lecture: "Vibration and Noise Control Harnessing Reconfigurable Modular Metastructures", Prof. Kon-Well Wang, University of Michigan.

In addition, the Track held a virtual award ceremony on Monday (November 16) to present the Per Bruel Gold Medal to Prof. J. Stuart Bolton, from Purdue University, and announce the Best Student Paper Competition winners. The award ceremony was followed by the general committee meeting.

Track 1: Plenary Lecture: Exotic Wave-Matter Interactions in Metamaterials Based on Broken Symmetries

Tuesday, November 17, 2020 12:15 PM – 1:00 PM

The track organizers were glad to have Prof. Andrea Alù from CUNY to give this year's Track Plenary Lecture.

Prof. Alù is the Founding Director and Einstein Professor at the Photonics Initiative, CUNY Advanced Science Research Center. He received his Laurea (2001) and PhD (2007) from the University of Roma Tre, Italy, and, after a postdoc at the University of Pennsylvania, he joined the faculty of the University of Texas at Austin in 2009, where he was the Temple Foundation Endowed Professor until Jan. 2018. Dr. Alù is a Fellow of NAI, IEEE, AAAS, OSA, SPIE and APS, and has received several scientific awards, including the IEEE Kiyo Tomiyasu Award, the Vannevar Bush Faculty Fellowship from DoD, the ICO Prize in Optics, the NSF Alan T. Waterman award, the OSA Adolph Lomb Medal, and the URSI Issac Koga Gold Medal.



In this talk, Prof. Alù discussed his recent research activity in acoustics and mechanics exploring tailored meta-atoms and suitable arrangements of them forming metamaterials that provide exciting venues to realize new mechanical phenomena and devices. He discussed venues to largely break reciprocity and realize isolation based on broken time-reversal symmetry induced by mechanical motion, spatio-temporal modulation and/or nonlinearities. Time modulation and/or mechanical motion offer an interesting opportunity to realize non-reciprocal devices for guided waves and free-space radiation in acoustics and mechanics, breaking the limitations of static, passive, linear metamaterials and opening tremendous opportunities for new frontiers of wave manipulation. Nonlinearities combined with geometrical asymmetries can also be used to break transmission symmetry and reciprocity, with interesting opportunities in acoustics and mechanics, both static and dynamic. Arrays of these elements also can enable topological order in metamaterials, with unusual sound and mechanical wave transport.

In addition to non-reciprocity, time modulation and mechanical motion open other opportunities for unusual wave interactions. An example is the possibility to pump energy in the system by extracting it from the modulation network. The most common way of achieving this parametric gain phenomenon is to modulate at twice the signal frequency, which may be used to amplify the signal traveling in the modulated system, or broaden its bandwidth of operation. Another opportunity is provided by commutated switching networks, which can convert frequencies with large efficiency, a functionality that can be exploited to establish new regimes of wave propagation and overcome the trade-off between delay and bandwidth in delay elements.

Another class of interesting metamaterials based on broken symmetries are parity-time symmetric metamaterials, which are asymmetric in space, but symmetric upon parity and time inversion. Combining these features provides intriguing phenomena for guided waves, radiation and scattering phenomena, which were discussed in detail during the talk. These non-Hermitian systems have been

drawing large interest in recent years, mostly in the context of quantum mechanics and optics. One particular feature that has been raising great interest is the emergence of exceptional point (EP) singularities in which the eigen-values and eigen-vectors coalesce and become degenerate. EP singularities are highly sensitive to small-scale perturbations, hence such systems are being considered towards sensor applications. However, superior sensitivity is anticipated within a narrow parameter space. Therefore, a careful balance of coupling, differential gain and phase-mismatch must be maintained among the system's degrees of freedom.

At last, Prof. Alù discussed the impact and opportunities of these concepts for mechanics and acoustics, and their relevance for unusual wave-matter interactions in scattering systems.

Rayleigh Lecture: Vibration and Noise Control Harnessing Reconfigurable Modular Metastructures

Tuesday, November 17th at 6:15 PM – 7:00 PM ET



The Rayleigh Lecture award is given to an individual who has made pioneering contributions to the sciences as well as application to industry. We had the privilege of inviting renowned researcher Prof. Kon-Well Wang from University of Michigan to give this year's Rayleigh Lecture.

Prof. Wang is the Stephen P. Timoshenko Professor of Mechanical Engineering (ME) at the University of Michigan (U-M) in Ann Arbor, MI, U.S.A. He received his Ph.D. degree from the University of California at Berkeley, worked at the General Motors Research Labs, and started his academic career as a faculty at the Pennsylvania State University in 1988. At Penn State, Prof. Wang has served as the William E. Diefenderfer Chaired Professor, Associate Director of the Vertical Lift Research Center of Excellence, and Group Leader for the Center for Acoustics and Vibration. Prof. Wang joined the U-M ME in 2008 as the Stephen P. Timoshenko Professor. He served as the ME Department Chair at U-M from 2008 to 2018. He is on an Intergovernmental Personnel Act rotator appointment as a Division Director at the National Science Foundation since January 2019. Prof. Wang's technical interests are in the emerging areas of structural dynamics, including metastable & multi-stable metastructures, origami dynamics, and adaptive structural systems, with applications in vibration & noise controls. He has received various recognitions, such as the Pi Tau Sigma-ASME Charles Russ Richards Memorial Award, the ASME J.P. Den Hartog Award, the SPIE Smart Structures and Materials Lifetime Achievement Award, the ASME Adaptive Structures and Materials Systems Prize, and the ASME N.O. Myklestad Award. He has been the Chief Editor for the ASME Journal of Vibration & Acoustics, and is an Editorial Advisory Board Member for the Journal of Sound and Vibration. Prof. Wang is a Fellow of the ASME, AAAS, and IOP.

In this lecture, Prof. Wang discussed the new concepts that have been explored in recent years to develop adaptive metastructures based on reconfigurable modular architectures. In one investigation, his research group studies the idea of creating engineered materials and structures from synergistically assembling and controlling metastable modules (modules that exhibit coexistent stable states under the same topology) and uncover their mechanics and nonlinear dynamics

behaviors due to metastability and multistability. Results show that such multifunctional metastructures yield significant adaptivity via modular reconfiguration, which would achieve numerous globally stable topologies, large variations in damping and stiffness, and tunable nontraditional wave propagation characteristics. In another study, building upon the architecture of origami, multifunctional adaptations are uncovered and explored for the control of structural shape, stiffness, energy absorption, nonlinear dynamics and vibration, acoustic band structures and noise transmissions. These unique characteristics are realized utilizing ideas such as fluidic-induced transformation and multistability, and lattice symmetry transformation in origami modular metastructures. Prof. Wang also discussed some of the recent research innovations and possible future directions and opportunities in synthesizing reconfigurable adaptive modular metastructures for structural vibration and acoustic control advancements.



NCAD Awards (Per Bruel Medal and Best Student Paper) and General Committee Meeting

Monday, November 16th at 6 PM – 7 PM ET

In this virtual meeting, we first recognized the recipient of this year's **Per Bruel Gold Medal**, Prof. J. Stuart Bolton from Purdue University in West Lafayette, Ind. Additional information on Dr. Bolton and the Per Bruel Gold Medal are provided in the next section.

The winners of the **Best Student Paper Competition** were also recognized at the NCAD Awards meeting. Winners will receive both an award certificate and a monetary reward from ASME/NCAD. The 2020 NCAD Best Student Paper Competition winners were:

- 1st Revant Adlakha from the University of Buffalo (NY, USA):
Paper: "A Linear Acoustic Phased Array for Nonreciprocal Transmission and Reception"
- 2nd Ren Ju from the Harbin Institute of Technology (Harbin, China)
Paper: "An Efficient Galerkin Averaging-Incremental Harmonic Balance Method Based on the Fast Fourier Transform and Tensor Contraction"
- 3rd Yichi Zhang from the University of Southern California (CA, USA)
Paper: "Medium Frequency Vibration Analysis of Beam Structures Modeled by the Timoshenko Beam Theory"

Per Bruel Gold Medal

Brent Paul

Per Bruel Gold Medal Recipient, J. Stuart Bolton

J. Stuart Bolton, Ph.D., A professor of mechanical engineering at Purdue University in West Lafayette, Ind., is recognized for seminal and far-reaching contributions to the field of acoustics and noise control engineering through research, education, service to the technical community and industrial engagement. Since joining the faculty at Purdue in 1984, Dr. Bolton has maintained an active research

program at the Ray W. Herrick Laboratories. He has published more than 100 archival journal articles, made over 200 conference presentations and supervised more than 100 graduate students.

The Per Bruel Gold Medal for Noise Control and Acoustics was established in 1987 in honor of Dr. Per Bruel, who pioneered the development of sophisticated noise and vibration measuring and processing equipment. The medal recognizes eminent achievement and extraordinary merit in the field of noise control and acoustics, including useful applications of the principles of noise control and acoustics to the art and science of mechanical engineering.

Anyone wishing to nominate deserving engineers for the Per Bruel award is welcome to do so by submitting the form at: [Per Bruel Award](#). Previous winners can also be found at that website.

Future NCAD Meetings

Yongfeng Xu

NCAD is excited to be sponsoring its annual technical track on Acoustics, Vibration, and Phononics at the IMECE 2021 **Virtual Conference**. This year's conference takes place online from November 1-4 2021.

The technical 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 following topics:

- 1-1: Phononic Crystals and Metamaterials
- 1-2: General
- 1-3: Passive, Semi - Active, and Active Noise and Vibration Control
- 1-4: Analytical and Computational Acoustics and Vibrations
- 1-5: Structural - Acoustic System Identification
- 1-6: Noise, Vibration and Harshness in Automotive Systems
- 1-7: Human Perception of Acoustics
- 1-8: Vibration and Acoustic Measurements, Signal Processing, and Test Facilities
- 1-9: Aero-acoustics and Sound Propagation
- 1-10: Flow-Induced Noise and Vibration
- 1-11: Turbomachinery Noise
- 1-12: Congress-Wide Symposium on NDE & SHM: Ultrasonic waves for material characterization and damage assessment
- 1-13: Congress-Wide Symposium on NDE & SHM: Computational nondestructive evaluation and structural health monitoring
- 1-14: Wave propagation in heterogeneous and architected media
- 1-15: Dynamics of adaptive engineering structures and materials

Studies may be experimental, theoretical, or numerical in nature. Industrial experiences related to these areas are of particular interest. Authors are invited to contribute manuscripts, extended abstracts, abstracts, presentations or posters.

Key dates for the IMECE 2021 virtual conference are as follows:

- 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
- May 28, 2021: Paper Review Completed

- June 15, 2021: Author Notification of Full-Length Draft Paper Acceptance /
Electronic Copyright Form Submission Process Opens
- July 02, 2021: Deadline for submission of Revised Full-Length Paper (if required)
- July 09, 2021: Deadline for Submission of Technical Presentation Only Abstracts
- July 13, 2021: Author Notification of Acceptance of Revised Full-Length Paper and
Technical Presentation Only Abstract
- July 30, 2021: Submission Copyright Form & Speaker Release Form
Presenting Author Registration Deadline
Submission of Final Paper
- August 23, 2021 Submission of Video Presentations

Additional information regarding IMECE 2021 is available at the conference website:
<https://www.asme.org/events/imece>

NCAD will continue to sponsor a “Best Student Paper Award” at IMECE 2021. The top 3 winners will receive an acknowledgement certificate and a monetary award. To be eligible for participation in this competition, the primary author must be a student, the entry must be a reviewed full conference paper, and the student must present the technical paper at the conference. Advisors must send an email to Dr. Guoliang Huang (huangg@missouri.edu) no later than Aug. 31st, 2020 for their students to enter the contest.

News and Notes from NCAD Members

Brent Paul

Dr. Weidong Zhu receives Faculty Award for Excellence in Research

Dr. Weidong Zhu received the 2020 University System of Maryland (USM) Faculty Award for Excellence in Research, which is the highest honor bestowed by the board to exemplary faculty members. Dr. Zhu is widely recognized as an international leader in the field of dynamic systems. His groundbreaking research has significantly improved the performance of a remarkable spectrum of critical engineering structures as varied as wind turbines, elevators, and automotive timing belts, all of which determine the quality of our everyday lives.

INCE Board Certification

The INCE-USA Certification Board is now accepting applications from individuals interested in becoming INCE Board Certified. The application deadline for 2021 is March 31st, 2021. The professional exam will be scheduled for some time in August 2021 at a location to be determined. If interested you can find complete details at (www.inceusa.org/boardcertification)

Submissions

NCAD would like to include news and information that would be of general interest to its members. This can include awards, promotions, workshops, etc. Please send that information to Brent Paul (ncad@asme.org) so it may be included in the next newsletter

NCAD Information

Noise Control and Acoustic Division

Founded in 1979, and established as a Division in 1981, The Noise Control and Acoustics Division meets yearly, usually at the ASME IMECE. Our division works in noise and vibration control, using computational techniques, analytical methods, and measurements to study complex aero-acoustic, hydro-acoustic, and structural-acoustic systems. The application of active and passive control systems is of consideration as well. Our symposia usually include sessions on flow-induced vibration and sound, structural acoustics, phonic structures, and active control.

Our ASME Community website is:

https://community.asme.org/noise_control_acoustics_division/default.aspx. The website includes past newsletters, along with selected Rayleigh lecture and tutorial presentations from past conferences.

NCAD also has a Facebook page:

<https://www.facebook.com/pages/NCAD-Noise-Control-and-Acoustics-Division/211722612197712>.

We will update this page with news and notes throughout the year. Please “Like” the page to follow our updates.

ASME Journal of Vibration and Acoustics

NCAD maintains three members whom are Associate Editors for the *ASME Journal of Vibration and Acoustics*. Please see the following web site for more information.

<http://journaltool.asme.org/Content/JournalDescriptions.cfm?journalId=18&Journal=VIB>

NCAD encourages authors of well-reviewed ASME NCAD conference papers to submit their work to the journal. The editors will work with you to minimize review times by using, as much as possible, the reviewers of the conference papers. Final papers are usually published in the journal about six months after acceptance. Please contact Dr. Mostafa Noah (mnouh@buffalo.edu) or other editors if you would like to pursue submitting your work to the journal.

NCAD is also pleased to announce that inauguration of an annual Best JVA Paper Award. The award is part of a joint effort between NCAD and the Technical Committee on Vibration and Sound (TCVS) within the ASME Design Engineering Division, and will be given annually to the best JVA paper that was published during a given calendar year. The winning paper will be chosen by a committee of JVA editors and NCAD/TCVS representatives and will be announced during the NCAD awards ceremony (wine and cheese reception) at IMECE. This year, the ceremony will take place in a virtual format as part of the online IMECE conference.

NCAD Leadership

Technical Committees

NCAD has three technical committees to help shape the Track we sponsor for conferences. We rely on the technical committees for planning individual sessions at a conference as well as the peer review process for conference papers. If you would like to become involved with any of these committees, including helping to plan future meetings, please contact the Technical chair that best suits your interest.

Phononic Crystals and Metamaterials Committee

Chair: Mahmoud I. Hussein, mih@colorado.edu

The Technical Committee on Phononic Crystals and Metamaterials (TCPCM) represents the technical areas related to the growing field of phononics. Phononic crystals and acoustic/elastic/phononic metamaterials are composite/non-uniform materials within which periodic, or generally spatially dependent, elastic, acoustic or thermal properties are engineered to achieve exceptional control primarily via wave-based mechanisms.

Mahmoud I. Hussein is the Alvah and Harriet Hovlid Professor at the Department of Aerospace Engineering Sciences at the University of Colorado Boulder. He holds a courtesy faculty appointment in the Department of Physics and an affiliate faculty appointment in the Department of Applied Mathematics, and he serves as the Faculty Director of the Pre-Engineering Program at the College of Engineering and Applied Science. He received a BS degree from the American University in Cairo (1994) and MS degrees from Imperial College, London (1995) and the University of Michigan–Ann Arbor (1999, 2002). In 2004, he received a PhD degree from the University of Michigan, after which he spent two years at the University of Cambridge as a postdoctoral research associate. His research focuses on the dynamics of materials and structures, especially phononic crystals and locally resonant phononic metamaterials, at both the continuum and atomistic scales. Professor Hussein is a Fellow of the American Society of Mechanical Engineers since 2019.



Structural Acoustics and Noise Control Committee

Chair: Yousof Azizi, AziziYousof@bfusa.com

The Technical Committee on Structural Acoustics and Noise Control represents technical areas related to structural vibrations, mechanical wave propagations in structures and heterogenous medium, interactions between mechanical waves and surrounding media, such as air and water, to radiate noise. It also serves to increase the understanding on noise generation mechanisms and to broaden noise control applications for various industries, including but not limited to automotive, off-highway vehicle, aircraft, mining and consumer electronics industries.

Accomplishments for 2020:

The Structural Acoustics and Noise Control Committee sponsored multiple technical topics at the IMECE2020 conference which was held virtually in November 2020. The topics included: (1) Passive, Semi-Active, and Active Noise Control, (2) Human Perception of Acoustics & Vibration and Acoustic Measurements, (3) Noise, Vibration and Harshness in Automotive Systems.

This year there were a total of 19 papers and presentations were submitted to the Structural Acoustics and Noise Control Committee sponsored sessions. All papers in the sessions were peer-reviewed by the Structural Acoustics and Noise Control Committee members, colleagues and peer authors and some of the papers were presented live virtually during the conference.

Planned Activities for 2021:

ASME IMECE2021 Conference will be held virtually in November. The Structural Acoustics and Noise Control Committee will sponsor four technical topics: (1) Passive, Semi-Active, and Active Noise Control, (2) Noise, Vibration and Harshness in Automotive Systems, (3) Structural-Acoustic System Identification, (4) Analytical and Computational Acoustics and Vibrations. The Structural Acoustics and

Noise Control Committee invites all ASME members and colleagues to contribute papers and presentations to these topics to make IMECE2021 another successful conference.

Dr. Yousof Azizi is currently serving as a Principal Researcher at Bridgestone Americas, Adjunct Professor of Mechanical Engineering at the University of Akron and founder of new start-up company Silentium. He received his MS degree in Electrical Engineering in 2009 and his Ph.D. in Mechanical Engineering from Purdue University in 2015. His work is mostly focused on automotive, aerospace and mobility systems noise and vibrations. His research interest includes broad areas of nonlinear dynamics, structural acoustics, and system and material modeling and identification. His recent research is focused on tuned lightweight acoustic cellular structures and metamaterials and active noise control. Dr. Azizi has more than 20 US and International patents and trade secrets, has authored two books and more than 30 peer reviewed papers.



Aero/Hydro Acoustics Committee

Chair: Michael Jonson (mxj6@arl.psu.edu)

The Aero/Hydro Acoustics Committee is composed of a group of people who enjoy learning about and sharing information on sound generation and propagation in all fluid media. That encompasses a wide range of technologies. We are interested in how flow generates noise through turbulent excitation, fluid-solid interaction, fluid-acoustic interaction, machinery, and any other mechanism that produces sound. We are also interested in propagation mechanisms through all types of fluids. We sponsor symposia on these subjects, but we welcome suggestions for other topics of interest in this area. Please attend the committee meeting during IMECE 2021 to suggest conference subjects.

Dr. Michael Jonson is a graduate of Penn State University with a degree in Mechanical Engineering. He is employed with the Penn State University Applied Research Laboratory, where he is the head of the Flow Acoustics Department. Mike has worked in the area of flow and structural acoustics for 36 years. Mike is also affiliated with Penn State's Aerospace Engineering Department where he has taught aeroelasticity and other courses.



The Aero/Hydro Acoustics Committee is currently in the rebuilding stage. Many of our past committee members have moved on so we are looking for new members to carry the torch. This emphasis of this committee has traditionally examined the interaction of heavier fluids with elastic structures at low Mach numbers such as water forcing functions acting on marine structures resulting in vibration and noise. These interactions are a niche area not considered in other societies.

Group Leadership Team Members

The activities of the division are directed by the Group Leadership Team, which establishes the Division's policy and goals. The Group Leadership Team is supported by other committees as needed. The committee members for 2020 – 2021 are:

Mostafa Nouh, University at Buffalo (SUNY), Chair

Dr. Nouh received his MS and PhD degrees in Mechanical Engineering from the University of Maryland, College Park (UMD). After graduation, he served as a research associate and an adjunct faculty at UMD for two years. He then joined the Mechanical and Aerospace Engineering department at SUNY Buffalo as an Assistant Professor in 2015 and became an Associate Professor in 2020. His research interests span the areas of acoustic metamaterials, vibration control, as well as thermoacoustic energy generation and control.



Weidong Zhu, University of Maryland, Vice-Chair

Weidong Zhu is a Professor in the Department of Mechanical Engineering at the University of Maryland, Baltimore County, and the founder and director of its Dynamic Systems and Vibrations Laboratory and Laser Vibrometry Laboratory. He received his double major BS degree in Mechanical Engineering and Computational Science from Shanghai Jiao Tong University in 1986, and his MS and PhD degrees in Mechanical Engineering from Arizona State University and the University of California at Berkeley in 1988 and 1994, respectively. He is a recipient of the 2004 National Science Foundation CAREER Award. He has been an ASME Fellow since 2010, and has served as an Associate Editor of the ASME Journal of Vibration and Acoustics and the ASME Journal of Dynamic Systems, Measurement, and Control, and as a Subject Editor of the Journal of Sound and Vibration and the journal Nonlinear Dynamics. His research spans the fields of dynamics, vibration, control, applied mechanics, metamaterials, structural health monitoring, and wind energy, and involves analytical development, numerical simulation, experimental validation, and industrial application. He has published 220 archival journal papers in these areas.



Haijin Liu, Temple University, Secretary/Treasurer

Haijun Liu is an Assistant Professor in the Department of Mechanical Engineering at Temple University. He received his Ph.D. in Mechanical Engineering from University of Maryland, College Park in 2012, and M.S. in Material Science and B.S. in Mechanical Engineering from Tsinghua University in 2005 and 2002, respectively. Before joining Temple in 2015, he was a postdoctoral researcher in the Sensor Science Division at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD. With a focus on the fundamental research of sensor science, his research interests include bio-inspired sensing and bio-mechanics, acoustic metamaterials, theoretical and experimental mechanics, shock wave and dynamic pressure measurement, and fiber optic and MEMS sensors.



Yongfeng Xu, University of Cincinnati, Program Chair

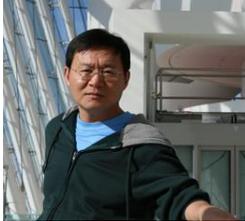
Yongfeng Xu is currently an Assistant Professor in the Department of Mechanical and Materials Engineering at the University of Cincinnati. He received his B.S. degree in Theoretical and Applied Mechanics from Sun Yat-Sen University in China. He received his M.S. degree and Ph.D. in Mechanical Engineering from the University of Maryland, Baltimore County. His research interests include structural dynamics and vibrations, modal analysis, finite element modeling, nondestructive evaluation, structural health monitoring and



digital signal processing.

Guoliang Huang, University of Missouri, Member

Guoliang Huang is a James C. Dowell Professor in the Mechanical and Aerospace Engineering Department. Dr. Huang works in the broad area of Solid Mechanics and Architected Materials in



particular the new frontiers of structural dynamics, topological mechanics, wave propagation, and dynamical behaviors of composite materials, both man-made and formed naturally. His recent research has been focusing on addressing challenges in development of passive and active metamaterials for wave propagation and noise control, mechanical topological insulator, vibration and sound mitigation, flow/structure interaction, aerodynamics, structural health monitoring, energy harvesting, bio-sensing, and among others. Dr. Huang is a renowned scholar in the emerging field of elastic and acoustic metamaterials and metacomposites. His work has pioneered a new class of *active metamaterials* with sensing, actuation and information processing and response and *space-time modulated metamaterials* for mechanical nonreciprocity.

Dr. Huang has published more than 130 first class international journal papers in those fields, one book, three chapters in book, and around 100 international conference publications. His research projects are funded by NSF, AFOSR, ARO, ONR, NASA, ARPA-E and major industries. He gave many plenary/keynote talks in many international and national conferences and served as organizing committee members. He is the fellow of international association of advanced materials (IAAMs) and he serves as Associate Editor of Wave Motion.

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