The 34th Conference on Mechanical Vibration and Noise

The Technical Committee on Vibration and Sound of the ASME Design Division

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VIB is a premier technical conference for the research and practice of vibration and sound engineering. An overall goal of the conference is to foster and promote the exchange of ideas and information among engineers and researchers in the vibration and sound community. The conference theme is deliberately broad, covering all aspects of vibratory systems. Papers are sought at the forefront of emerging fields, from traditional and non-traditional academic research, and those driven by industrial applications. Experimental, analytical, and computational studies are all welcome.

VIB-1: Dynamics of MEMS and NEMS

Cross listed with MNS-1: Micro/Nano Dynamics

Symposium Organizers

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Symposium Description

This symposium invites papers and technical presentation submissions on fundamental, experimental, and theoretical research into micro and nano dynamics. Topics of interests include, but are not limited to: nonlinear phenomena, such as chaotic dynamics, parametric excitation, self-excitation, and nonlinear resonant interaction; collective behaviors, such as localization and synchronization; dynamic response phenomena used to realize enhanced sensitivity in MEMS and NEMS sensors; reliability issues, such as their response to mechanical shock and capillary forces; transient behaviors, such as dynamic pull-in and escape phenomena; and linear/nonlinear dynamics.

VIB-2: Dynamics of Soft Media and Robotics

Symposium Organizers

Hongbin Fang
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Suyi Li
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Symposium Description

This symposium concerns the nonlinear dynamics of soft media and continuous robots. Studies on other mechanical systems with distributed parameters and large deformations are also welcomed. Topics of interest include the modeling, dynamic analysis, model-based control, and experiments for continuum robots (soft robotic manipulators and soft locomotion robots, etc.), soft matters (polymers, foams, gels, colloids, and soft biological materials, etc.), as well as other prototypical elastic continua that can be easily deformed (strings, beams, shells, etc.).

VIB-3: Dynamics & Waves in Solids and Metamaterials

Symposium Organizers

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Serife Tol
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Symposium Description

This symposium solicits papers in the broad area of dynamic phenomena of a wave-like nature in solids and metamaterials. Submissions are invited, but not limited to, papers addressing phononic crystals, acoustic metamaterials, metasurfaces, topological insulators, ultrasonics, nonlinear wave propagation, and wave-based devices. This can include studies of negative refractive index, acoustic cloaking, non-reciprocal wave transport, flat modes, topological edge states, quantum analogs, nonlinear behavior, and novel applications of acoustic materials aimed at solving contemporary problems. Other topics that may be of interest include novel fabrication and manufacturing technologies (e.g., self-assembly, additive manufacturing) which enable applications, new computational approaches for simulating wave propagation, and advances in experimental measurements of wave propagation in mechanical systems.

VIB-4: Energy Harvesting

Symposium Organizers

Wei-Che Tai
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Symposium Description

This symposium solicits research in all aspects (analytical, numerical, and experimental) of vibration energy harvesting. Topics include nonlinear phenomena; flow-induced vibration; wave energy conversion; applications in biomechanics; novel circuits and storage devices; energy harvesting using metamaterials; novel MEMS and NEMS systems; and novel applications/analysis of active materials and electromechanical transducers.

VIB-5: Fluid-Induced Vibrations

Symposium Organizer

Mark Jankauski
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Symposium Description

Flow-induced vibrations represent a broad class of problems where a fluid or gaseous medium influences the vibration of a structure. Examples include vibrations of pipes transporting fluid, wind-induced vibrations of suspension bridges, and flapping insect wings that deform under inertial and aerodynamic loads. This symposium will highlight advances in modeling and experimental methodologies for problems in flow-induced vibration, fluid-structure interaction and aeroelasticity. Further, this symposium will feature research demonstrating the application of existing techniques to novel flow-induced vibration problems.

VIB-6: Industrial Applications of Vibration & Acoustics

Symposium Organizers

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Brian Olson
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Ron Couch
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Symposium Description

The symposium on Industrial Applications of Dynamics, Vibration, and Acoustics provides a forum for sharing ideas, activities, best practices, and innovative solutions to applied problems faced by industry, national laboratories, academia, and related partners. Applications ranging from the automotive industry to national defense increasingly require innovative analysis, simulation and testing to solve complex problems involving vibration, acoustics, and dynamics phenomena. Abstracts are invited that cover standard and nonstandard, multi-disciplinary, and systems-level techniques in vibration, acoustics, dynamics, and related areas of application.

VIB-7: Jointed Structures, Contact, and Friction

Cross listed with MSNDC-3: Contact and Interface Dynamics

Symposium Organizer

Aabhas Singh
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Symposium Description

This symposium is focused on the study of mechanical joints, contact, friction, and damping. The goal of this symposium is to promote discussion and a better understanding between these topics and to generate new perspectives on the linkage between friction at a tribological level, contact mechanics, and the responses of built-up assemblies containing joints at a structural level. All papers concerned with the dynamics and mechanics of jointed structures, contact, friction, and damping are invited for this symposium, with particular emphasis on the following challenges:, hysteresis in jointed structures, repeatability and variability of the response of jointed structures, complex loading methods, physical theories and studies of friction, measurements and predictions of energy dissipation and damping, and methods to account for uncertainty and nonlinearity in structures with joints, contact, friction, or damping, development and validation of predictive models of contact. Related topics, e.g. tribology studies, surface chemistry, frameworks for multi-scale modeling, gaskets, glued interfaces, etc., are invited as well.

VIB-8: Nonlinear Systems & Phenomena

Cross listed with MSNDC-4: Nonlinear Dynamics of Structures.

Symposium Organizer

Mohammed Ameen Al Shudeifat
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VIB-9: Rotating Systems and Rotor Dynamics

Cross listed with MSNDC-13: Nonlinear Rotordynamics and Rotating Systems.

Symposium Organizers

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Mark Tien
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Symposium Description

This symposium is focused on the dynamics of rotating structures for applications in design, development, analysis, operation and monitoring. Areas of interest include both computational and experimental work focused on studying the dynamics of rotating systems, including but not limited to: gas and steam turbines used in aircraft engines and for power generation; compressors; geared systems; centrifugal pendulum vibration absorbers; wind turbine and helicopter rotors; motors; and MEMS devices. Topics of interest include reduced-order modeling techniques, linear and nonlinear vibration analyses, fluid-structure interaction, multi-physics modeling and analysis, and experimental methods. Papers on other related topics are also welcome.

VIB-10: Structural Damage Detection and Diagnostics

Symposium Organizers

Weidong Zhu
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Yongfeng Xu
University of Cincinnati
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Symposium Description

The Technical Committee solicits papers for several technical sessions for a symposium on Structural Damage Detection and Diagnostics. This symposium is focused on techniques for effective use of existing and new sensors, signal processing and conditioning, pattern recognition techniques, applications of artificial intelligence (AI), and vibration- and wave-based damage detection. Papers are invited on, but not limited to, the following: vibration measurements using laser vibrometry and digital image correlation, AI-based structural damage detection, remote and on-line monitoring and diagnostics, sensor fusion, signal conditioning, advances in system identification, applications of advanced signal processing, pattern recognition techniques, optimization in condition monitoring, smart sensors and devices, fault diagnosis and prognosis, non-destructive testing, reliability engineering, risk management, plant maintenance and management, failure analysis, and health management of mechanical/structural systems.

VIB-11: Time-delay Systems and Discontinuous Dynamical Systems

Cross listed with MSNDC-7: Time-Varying and Delay Systems

Symposium Organizers

Zoltan Dombovari
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David Lehotzky
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Ashu Sharma
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Symposium Description

The purpose of this symposium is to foster and promote the exchange of ideas and information among engineers and researchers in the vibration and sound community. Papers are sought at the forefront of emerging fields, from traditional and non-traditional academic research, and those driven by industrial applications. Experimental, analytical, and computational studies are all welcome related to the field of time-delay and discontinuous dynamical systems.

Papers in the following areas of time-delay systems and discontinuous dynamical systems are particularly encouraged:

- continuous, smooth, non-smooth and hybrid systems,
- bifurcations, fast/slow dynamics, quasi-periodicity, chaos,
- cross-disciplinary topics from, physics, bioscience, medicine, materials, and other related disciplines.
- applications and problems from any discipline of engineering sciences,
- models, analytical, numerical, computational, and experimental methods,
- deterministic, stochastic, uncertain systems,
- fractional-order systems,
- qualitative and quantitative analyses,
- vibration suppression and control of dynamical behaviors,

Papers dealing with experimental investigations and phenomena experienced in practical mechanical systems are especially welcome.

VIB-12: Vibration and Stability of Mechanical Systems

Symposium Organizers

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Chenxin Wang
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Symposium Description

The scope of the symposium is deliberately broad to encourage submissions from the wide range of problems tackled by researchers in dynamics and vibrations. We invite researchers working in any application of vibration to submit their work. Past submissions have been from applications such as spinning systems, origami-inspired structures, vibration energy harvesting, cyclically symmetric structures, gear vibrations, machine tool dynamics, computational methods, and dynamics of biological systems. Innovative studies of linear systems, nonlinear vibrations, dynamic stability, and systems with time-varying parameters are welcome. Submissions can be focused on analytical, experimental, or computational methods.

VIB-13: Passive and Active Control of Vibration, Shock, and Noise

Symposium Organizer

Kai Zhou
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Yi Guo
National Renewable Energy Laboratory
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Symposium Description

This symposium solicits research contributions in all areas of passive and active vibration control. This includes novel vibration control devices, vibration damping techniques, the use of smart materials for vibration control, hybrid techniques that blend active and passive control, and innovative vibration control solutions. Submissions that focus on analytical, computational, or experimental methods are welcome.

VIB-14: Vibration of Continuous Systems

Symposium Organizers

Dumitru I. Caruntu
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Weidong Zhu
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Sichen Yuan
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Symposium Description

This symposium deals with vibration of continuous structures. Topics of interest include modeling, analysis, and experiments for prototypical structures such as strings, cables, rods, beams, membranes, plates, shells, as well as other elastic continua. Manuscripts addressing assemblies; continuous systems with dissipative, gyroscopic, or non-linear forces; novel methods of measurement and actuation; local and global discretization strategies; and coupling phenomena are of interest, but other contributions are also welcome.

VIB-15: Machine Learning Applications in Vibrations and Dynamics

Cross listed with MSNDC-6: Machine Learning in Dynamics

Symposium Organizers

Cari Martine
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VIB-16: Keynotes

Peter Coffin
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Symposium Description

Prof. Philip Bayly, Department Chair and the Lee Hunter Distinguished Professor, Washington Univ. in St. Louis: “Making Waves: Instability and Oscillations in Cilia and Flagella”.

2022 ASME N. O. Myklestad Award Winner