

1. Internal Waves in Fluids, Chair: Peter Diamessis, Cornell University, Ithaca, NY, 9-12 June, 2014,  
<http://nonlinearinternalwaves2014.com/>

Internal waves (IW) are a form of wave motion unique to the stably stratified portion of the ocean, lakes and atmosphere. Finite amplitude IWs are subject to complex nonlinear interactions when they encounter topographic boundaries, variations in the ambient stratification and background current shear. Over the last decade, multiple field, laboratory, computational and theoretical studies on nonlinear effects in IWs have emerged. Nevertheless, a gap in understanding still separates the relevant findings of various communities.

The USNCTAM-sponsored Symposium will bring together an interdisciplinary mix of researchers from the physical oceanography, dynamical meteorology and fundamental fluid dynamics communities with a broad range of expertise levels and countries of origin (including the U.S., Canada, Europe and Australia). Nonlinear effects in IWs will be discussed from an observational, experimental, numerical and analytical viewpoint.

Our objectives, and associated benefits, are:

- Stimulate open and informal discussion among attendees.
- Bridge any gaps in understanding on nonlinear IW refraction/reflection (and other nonlinear effects) and enable broader perspective across disciplines.
- Define new and more efficient directions of research.
- Seed interdisciplinary and international collaborations.
- Connect laboratory and numerical research with field observations
- Generalize insights to the broader field of nonlinear wave physics.

Funding has been secured from USNCTAM, NSF, ONR and ENS-Lyon. The host Cornell School of Civil and Environmental Engineering is providing logistical support and additional funding.

2. Dynamics of Metamaterials, Chair: Michael Leamy, Georgia Tech, Atlanta, GA, 2-4 April, 2014,  
<http://blogs.ubc.ca/amerimech2014/category/uncategorized/>

Developments in manufacturing technologies, including rapid prototyping and 3-D printing among others, have led to the creation of multifunctional lightweight materials with periodic microstructures at length scales on the order of a few microns. The ability to control wave and acoustic response by designing microarchitecture has led to the emergence of linear and nonlinear acoustic metamaterials and phononic crystals. While there has been great and growing interest in this area, much of the research has been performed with little cooperation on a large or national scale, and with little input from major funding establishments. The timing of the field is such that a great need exists to bring together members of multiple research communities (dynamical systems,

mechanics of materials, MEMs, and others) and program managers from major funding sources (National Science Foundation, Army Research Office, Office of Naval Research, and others) to identify needs and research directions.

Recognizing this need, the investigators will hold an AmeriMech Symposium on the Dynamic Response of Periodic Materials and Structures at the Georgia Institute of Technology in April 2014. The symposium aims to bring together 40-50 junior and senior researchers working on periodic materials and structures in order to a) share recent and emerging developments in periodic structures and materials (cellular/lattice materials, acoustic metamaterials, phononic crystals); b) identify areas requiring new developments in theory, manufacturing technologies, and applications; and c) gather input from program managers on promising applications of periodic structures that are driven by national needs.

### 3. Mechanics in Biology, Organizer: Sunny Jung, Virginia Tech, Blacksburg, VA, 22-23 May 2014, <http://amerimech.esm.vt.edu>

The fundamentals and rigor of mechanics play an important role in many emerging areas of research in biological science. With its wide interdisciplinary focus rooted in mechanics, the Virginia Tech Department of Engineering Science and Mechanics ([www.esm.vt.edu](http://www.esm.vt.edu)) is hosting a symposium focused on “Mechanics in Biology” under the auspices of the US National Committee for Theoretical and Applied Mechanics (<http://sites.nationalacademies.org/pga/biso/IUTAM/>).

The AmeriMech2014 symposium will be held at Virginia Tech on May 22nd & 23rd. This event will be a deliberately small symposium designed to facilitate the interdisciplinary cross pollination of ideas and to foster research collaborations to pursue research of biological phenomena under various stresses in the mechanical frameworks. The focus is on current and future problems that lie at the intersection between mechanics and biology. The workshop format is 20-min oral presentations by senior experts and 5-min poster presentation by young investigators. The expected audience is researchers and graduate students who are interested in bio-inspired science and technology.