

## Newsletter of the U.S. National Committee on Theoretical & Applied Mechanics (USNC/TAM) FALL 2019

### Chair's Welcome

Welcome to the USNC/TAM Newsletter! After a nearly two-decade long hiatus, we are pleased to resurrect this Newsletter of the US National Committee on Theoretical and Applied Mechanics in an electronic format, available at the USNC/TAM website, and distributed through member society mailing lists. The primary objectives of the Newsletter are to keep the community apprised of the activities of the Committee in promoting mechanics, and to provide information on opportunities for engagement in relevant symposia and conferences at the national and international levels. We intend this to be an annual Newsletter, issued in the Fall of each year.

In this Newsletter, I am happy to report on the launch of three exciting new programs. (i) The [Thomas J.R. Hughes Travel Fellowship Program](#) has been established: This biennial fellowship program will support travel fellowships to the 25<sup>th</sup> International Congress of Theoretical and Applied Mechanics in Milan, Italy in August 2020, the 19<sup>th</sup> US National Congress of Theoretical and Applied Mechanics in 2022, in Austin, Texas, and beyond. We thank Professor Wing-Kam Liu of Northwestern University for his generous work in raising the funds and making this recurring program possible. (ii) A new [USNC/TAM Young Observer Program](#), aimed at inviting young researchers to participate in the Annual Meeting of the USNC/TAM, will be introduced beginning with the April 2020 annual meeting. The objective is to develop interest in the activities of the USNC/TAM among young researchers; we are hoping to trigger a similar program at the International level as well. (iii) A major new initiative of the Committee is the launching of a new [Distinguished Public Lecture Series](#). We hope to bring exciting speakers through this series and engage the students and teachers in the STEM fields and the general public across the nation. Details of all three programs are given below.

A new e-mail system has been established with the following addresses: [chair@usnctam.org](mailto:chair@usnctam.org), [vicechair@usnctam.org](mailto:vicechair@usnctam.org), [pastchair@usnctam.org](mailto:pastchair@usnctam.org), [secretary@usnctam.org](mailto:secretary@usnctam.org), [executivecommittee@usnctam.org](mailto:executivecommittee@usnctam.org), and [IUTAMdelegates@usnctam.org](mailto:IUTAMdelegates@usnctam.org). Future communications from the USNC/TAM will come from these addresses to streamline communications. We welcome your comments and suggestions on the activities of the USNC/TAM.

- Ravi-Chandar (USNC/TAM Chair, 2019-2020)

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### Report from the Annual Meeting of the USNC/TAM

The annual meeting of the USNC/TAM was held on March 29/30, 2019 at the National Academies Building, 500 Constitution Avenue, Washington, DC. A specific focus of the half day meeting on March 29 was on the use of digital tools, including AI and machine learning as well as web resources in teaching and research within Mechanics, with presentations by Nicole Sharp (FYFD!), Daniel Lopez (DOE-ANL), Subramanian Sankaranarayanan (ANL), Charles Meneveau (JHU) and Teng Li (Univ Maryland). Videos of all of the lectures are available [online](#). On Saturday March 30<sup>th</sup>, Society Representatives for each of the Member Societies reported on mechanics-related activities and awards presented over the previous year; and the site for the 19<sup>th</sup> US National Congress of Theoretical and Applied Mechanics in 2022 was selected (see details below).

The 2020 Annual Meeting of the USNC/TAM will be held on April 17/18, 2020 in Washington, DC, and will feature a new USNC/TAM Distinguished Lecture series (see additional details below). In addition, to promote active participation in USNC/TAM we will be inaugurating a *Young Observer* program for future leaders in Mechanics-based education and research as described below.

## Announcement of the Thomas J.R. Hughes Travel Fellowship Program

The USNC/TAM is proud to announce the establishment of a new travel fellowship program. These fellowships, named the **Thomas J. R. Hughes Travel Fellowship from the USNC/TAM** will provide travel support for doctoral and/or post-doctoral students enrolled at universities in the United States to attend the U. S. National Congress for Theoretical and Applied Mechanics or the International Congress of Theoretical and Applied Mechanics. The intent of such fellowships is to attract and recruit qualified individuals into the field of mechanical science and engineering and to broaden participation from underrepresented groups. A total of five fellowships will be awarded to each of these meetings; selections will be made by a subcommittee of the USNC/TAM. We plan to send the inaugural class of five Hughes Fellows (doctoral and post-doctoral students) to Milan, Italy in August 2020 to present their work at the 25<sup>th</sup> International Congress of Theoretical and Applied Mechanics. This biennial fellowship program will also support travel fellowships to the US National Congress of Theoretical and Applied Mechanics in 2022 and beyond. A call for applications for the 2020 fellowship program for travel to the ICTAM in Milan, Italy will be issued in January 2020.

## Announcement of the USNC/TAM Young Observer Program

The USNC/TAM invites member professional societies to nominate a young professional to be an observer at its annual committee meeting. The observers will gain experience in science policy and diplomacy through exposure to the functions and responsibilities of the National Committee, as well as learning about opportunities for further engagement with USNC/TAM. A young professional is considered to be someone who is within 10-15 years of receiving his or her PhD and/or first professional appointment in an engineering or related field. The 2020 annual committee meeting will be held at the National Academy of Sciences building in Washington, DC and will be held in conjunction with the first in a series of Distinguished Lectures sponsored by the USNC/TAM. The meeting will begin at noon on Friday April 17<sup>th</sup> and end mid-afternoon on Saturday the 18<sup>th</sup> of April. The observer will be invited to have dinner with the Committee on Friday night and the hotel accommodation for that night will be covered by the Committee.

Society Representatives should send their nominations to Prof. Linda Franzoni, [Secretary of the USNC/TAM](#), by November 15, 2019 (one nomination per society). The Committee anticipates selecting one or two Observers each year. Nominees and nominators will be notified of the Committee's decision by December 20, 2019.

## USNC/TAM Distinguished Lecture Series

The USNC/TAM is proud to launch a new series of Distinguished Public Lectures on Theoretical and Applied Mechanics. The objective of this series is to convey excitement, to stimulate interest, and to discuss opportunities in the mechanical sciences and engineering related to advances in infrastructure, automation, transportation, energy, bio-medicine, sustainability, exploration, and other areas. The targeted audience includes students and teachers interested in STEM fields at high schools across the nation and the general public. The lectures are free and open to the public. They will be streamed live and archived for future use.

The inaugural Lecture in this series will be given in the afternoon of Friday April 17 by **Dr. Adam D. Steltzner** of NASA's Jet Propulsion Laboratory at the Auditorium of the National Academy of Sciences, Engineering and Medicine. Adam holds a PhD in Engineering Mechanics from UW-Madison and is perhaps most widely known for his engineering and outreach work related to the [Seven Minutes of Terror](#) associated with landing the Curiosity Rover on Mars in 2012.

## Upcoming Conference Dates and Deadlines



The 25<sup>th</sup> Quadrennial **International Congress on Theoretical and Applied Mechanics** (ICTAM) will take place from August 23-28, 2020. The ICTAM website is now active at <https://www.ictam2020.org/> and lists the two plenary speakers, 16 Sectional Lecturers and six specialized mini-symposia. Abstract submissions will be accepted from October 1, 2019 – January 10, 2020. Once again the USNC/TAM will be offering a limited number (~20) of travel fellowships and mentoring programs for young Mechanicians (postdoctoral researchers and assistant professors) who have their papers accepted for presentation (call to be released in

January 2020); these are in addition to the Thomas J.R. Hughes Travel Fellowships described above.

There are also 8 IUTAM symposia taking place in 2020 as well as an IUTAM/CISM summer school in Udine. Details are available at: <https://iutam.org/accueil/>. We anticipate that the next call for proposals for 2022/2023 Symposia will be announced in Fall/Winter 2019/2020, with decisions to be made by the Fluids and Solids Symposia Panels at the next meeting of the International Union during ICTAM 2020. Individuals interested in proposing symposia for the 2022/2023 period should contact Prof. Linda Franzoni, [Secretary of the USNC/TAM](#), for assistance in developing such proposals.

The 19<sup>th</sup> US National Congress on Theoretical and Applied Mechanics (USNC/TAM) will take place June 18-24, 2022 on the campus of The University of Texas at Austin. Advance details are available from the Conference Co-Chair, Prof [Chad Landis](#).

## AmeriMech Symposia

In addition to the IUTAM workshop framework (which offers up to \$5000 towards the costs of organizing a workshop, but which requires 2 years of advance planning), the USNC/TAM has also developed a faster, more nimble funding mechanism known as *AmeriMech Symposia* to help Mechanics researchers rapidly develop ideas for small, targeted workshops in emergent fields and hot topics. A list of recent AmeriMech Symposia and details of the submission process are available [here](#). The deadline for submission for 2020 and 2021 AmeriMech Symposia is Nov. 30, 2019. Please see the above website, and contact the AmeriMech Symposia Chair, Prof [Tarek Zohdi](#) for additional details.

## Recent Trends Reports

The USNC/TAM is pleased to invite proposals for reports in the *Reports on Recent Trends in Mechanics* series. This series has resulted in several reports since 1991 on topics ranging from general computational mechanics, fluid mechanics, mechanics and medicine, additive manufacturing as well as other topical areas. More information on previous reports is available at the [Reports website](#).

Researchers and research teams interested in the creation of a new report in a relevant topical area may submit a 250 word proposal to the USNC/TAM review subcommittee ([Thomas Pence](#), [Anne M. Grillet](#), [Richard Neu](#)) via email to all of the above by **March 15, 2020**. Proposals will be reviewed by the subcommittee and confirmed by the full USNC/TAM in April 2020 with decisions for going forward announced by April 30, 2020. Full reports will be due six months later (October 31, 2020) and the full reports will be reviewed by the USNC/TAM prior to publication. Please contact one of the sub-committee members for additional information.

## USNC/TAM Member Societies and Officers

### *Executive Committee (2019-2020)*

Chair	Krishnaswamy Ravi-Chandar (University of Texas at Austin)	Vice Chair	Beverley McKeon (Caltech)
Secretary	Linda Franzoni (Duke)	Past Chair	Gareth McKinley (MIT)

### *Member societies and current representatives*

AAM American Academy of Mechanics	Ellen Aruda (University of Michigan)
AIAA American Institute of Aeronautics & Astronautics	[open]
AICHE American Institute of Chemical Engineers	Paul Steen (Cornell University)
APS American Physical Society	Beverley McKeon (Caltech)
AMS American Mathematical Society	[open]
ASA Acoustical Society of America	Robert Koch (Naval Undersea Warfare Center)
ASCE American Society of Civil Engineers	Jose Andrade (Caltech)
ASME American Society of Mechanical Engineers	Yonggang Huang (Northwestern University)
ASTM International	Richard Neu (Georgia Tech)
SEM Society for Experimental Mechanics	Wendy Crone (University of Wisconsin, Madison)
SES Society of Engineering Science	Kyung-Suk Kim (Brown University)
SIAM Society for Industrial & Applied Mathematics	Qiang Du (Columbia University)
SOR Society of Rheology	Shelley Anna (Carnegie Mellon University)
USACM U.S. Association for Computational Mechanics	Tarek Zohdi (University of California, Berkeley)
Members-at-Large	Tom Pence (Michigan State University)
	Anne Grillet (Sandia National Laboratory)
	Tarek Zohdi (University of California, Berkeley)

### *National Academies Staff*

Senior Program Officer	Ana Ferreras	BISO Director	Kathie Bailey
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### **About USNC/TAM**

The U.S. National Committee on Theoretical and Applied Mechanics (USNC/TAM) represents the United States in national and international activities related to the broad science of mechanics, including related sciences, engineering and mathematics. It serves as a focal point for charting future priorities in mechanics related research, applications and education. It represents the United States in the [International Union of Theoretical and Applied Mechanics \(IUTAM\)](#). For more information regarding USNC/TAM, please refer to the [committee website](#). The IUTAM was founded in 1946 and USNC/TAM was formed in response in 1948, coming under the umbrella of the National Academies in 1966. Please send newsletter ideas and suggestions to [vicechair@usnctam.org](mailto:vicechair@usnctam.org).