

# **International Union of Theoretical and Applied Mechanics (IUTAM)**

## **Activities' Report - Year 2021**

**Enrico De Bernardis**

### **1. Introduction**

The 25th International Congress of Theoretical and Applied Mechanics was held in a fully virtual format during August 22-27 2021. In addition to the 4 plenary lectures and 16 sectional lectures, 1423 contributed papers were presented at the Congress. Of these, 129 were keynote invited papers associated with Mini-Symposia and Thematic Sessions. Submissions were solicited in two calls. The number of papers submitted to the Congress in the first call, that ended in January 2020, is 3158. The second call for abstracts for short oral presentations with poster followed the decision to postpone the Congress by a year; it was originally to be held in 2020. 237 abstracts were received in this call. All contributed papers were reviewed by the International Papers Committee (IPC). A total of 3108 papers were selected for presentation. Of the 1423 contributed papers presented at the Congress, 617 were in the area of Fluid Mechanics, 594 in Solid Mechanics and 212 in Fluid-Solid interactions. The break-up for the 129 keynote invited papers in the three areas is 52, 39 and 38 respectively. The event witnessed paper presentations from 59 countries.

With a total of 3395 submissions to be evaluated, which is far more than the number of submissions in earlier congresses.

This was the first time that an ICTAM was held in a virtual setting. The Congress Committee is sincerely thankful to Professors Alberto Corigliano and Umberto Perego for their wise leadership of ICTAM2020+1 in addressing the constraints and challenges posed by the pandemic.

The 26th International Congress of Theoretical and Applied Mechanics (ICTAM2024) will be held during August 25-30, 2024 at the EXCO, the convention center in Daegu, Korea. It will be organized under the leadership of ICTAM2024 President Heuy Dong Kim and ICTAM2024 Secretary-General Simon Song. The preparations for the organization of the congress are in progress.

The IUTAM General Assembly meeting was held in two sessions on 22 and 25 August 2021 by electronic means during the virtual 25th ICTAM held in Milano, Italy. Among the items discussed and decided upon at the meeting were the following.

#### ***Matters concerning Adhering Organizations***

The General Assembly considered the issue of subscription dues, whose payment is required by IUTAM's Statutes, which had not been paid by adhering organizations from certain countries. The General Assembly undertook the relevant measures and suspended three adhering organizations which had not paid their dues; more details will be provided in the IUTAM Report 2021.

#### ***Election of the new Treasurer of IUTAM***

The General Assembly elected Professor Pilar Ariza Moreno (Spain) as the IUTAM Treasurer for the period 2021-2024.

#### ***Discussion on registration of IUTAM***

A resolution was discussed aiming to establish, in addition to the current IUTAM organization, a new IUTAM Association in the Netherlands as an entity with full legal capacity. Members of the General Assembly would become members of the IUTAM Association. After the discussion, the proposal did not receive sufficient support. The General Assembly recognized the need for registration of IUTAM as a legal entity and asked the Bureau to continue to work on it and report back any progress at the next General Assembly meeting in August 2022.

#### ***Presentation by Diversity Working Group and discussion***

Following the discussion at the last General Assembly meeting in August 2020, the IUTAM Bureau appointed the Diversity Working Group (DWG). The Chair of the DWG, Professor Pilar Ariza, presented a report by the

DWG on diversity within IUTAM. The presentation was followed by several recommendations and a discussion. The General Assembly adopted an action plan regarding diversity, according to which the Bureau would solicit written feedback on the issue from the General Assembly members and propose a resolution for voting at the next General Assembly meeting in August 2022.

### ***Date and venue of the next General Assembly meeting***

The General Assembly agreed to hold its next meeting in Cambridge, UK, 21-24 August 2022.

## **2. Main activities carried on by IUTAM during 2021 relevant for Italy and for CNR**

Due to the breadth of disciplinary interests of CNR and the involvement on topics of Mechanics, the whole body of the activities (Symposia and Summer Schools) carried out, or sponsored, annually by IUTAM, is the object of potential interest for this part of the Italian scientific community. The initiatives carried out during 2021 are listed, in chronological order, grouped by type.

### **IUTAM Symposia**

#### ***IUTAM Symposium on Mechanics of smart and tough gels***

Place: Austin, Texas, USA – online event. Date: May 24 – May 29, 2021.

Co-Chair: Prof. R. Huang, University of Texas at Austin

Email: [ruihuang@mail.utexas.edu](mailto:ruihuang@mail.utexas.edu)

Co-Chair: Prof. X. Zhao, Massachusetts Institute of Technology, Boston, USA

Email: [zhaox@mit.edu](mailto:zhaox@mit.edu)

Website: <https://sites.utexas.edu/iutam2021>

#### ***IUTAM Symposium on Computational methods for large-scale and complex wave problems***

Place: Tokyo, Japan – online event. Date: June 25 – June 26 and July 2 – July 3, 2021.

Chair: Prof. K. Kishimoto, Tokyo Institute of Technology

Email: [kkishimoto@ocean.zaq.jp](mailto:kkishimoto@ocean.zaq.jp)

Website: <http://www.solidmech.mech.e.titech.ac.jp/IUTAM2021/>

#### ***IUTAM Symposium on Generalized continua emerging from microstructures***

Place: Paris, France – hybrid event. Date: July 19 – July 23, 2021.

Chair: Prof. Prof. S. Forest, Mines ParisTech CNRS

Email: [samuel.forest@mines-paristech.fr](mailto:samuel.forest@mines-paristech.fr)

Website: <https://iutam-2021-gc.sciencesconf.org/>

### **IUTAM Special Event**

#### ***Fluid mechanics in the spirit of G. K. Batchelor***

Place: Cambridge, UK – online event. Date: March 29 – March 31, 2021

Chair: Prof. P.F. Linden, University of Cambridge, DAMTP

Email: [pfl4@cam.ac.uk](mailto:pfl4@cam.ac.uk)

Website: <http://www.damtp.cam.ac.uk/events/batchelorcentenary/>

### **IUTAM Endorsed Events**

#### ***1st BICTAM-CISM Symposium on Dispersed Multiphase Flows: from Measuring to Modeling***

Place: Online event. Date: March 2 – March 5, 2021

Co-Chair: Prof. Jiachun Li, Email: [jcli05@imech.ac.cn](mailto:jcli05@imech.ac.cn)

Co-Chair: Prof. Cristian Marchioli, Email: [cristian.marchioli@uniud.it](mailto:cristian.marchioli@uniud.it)

Website: <http://158.110.32.35/BICTAM-CISM>

#### ***International Symposium on Co-Simulation and Solver Coupling in Dynamics***

Place: Online event. Date: May 24 – May 25, 2021

Co-Chair: Dr. Francisco J. González, Email: [f.gonzalez@udc.es](mailto:f.gonzalez@udc.es)

Co-Chair: Prof. Javier Cuadrado, Email: [javier.cuadrado@udc.es](mailto:javier.cuadrado@udc.es)

Website: <http://lim.ii.udc.es/events/cosim2020>

### ***InterPore2021 Conference***

Place: Online event. Date: May 31 – June 4, 2021

Chair: Prof. Oleg Iliev, Email: [oleg.iliev@itwm.fraunhofer.de](mailto:oleg.iliev@itwm.fraunhofer.de)

Website: <https://www.interpore.org/2021>

### ***1st IACM Conference on Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology***

Place: San Diego, California, USA. Date: September 26 – September 29, 2021

Co-Chair: Prof. Wing Kam Liu, Email: [w-liu@northwestern.edu](mailto:w-liu@northwestern.edu)

Co-Chair: Prof. J. S. Chen, Email: [js-chen@ucsd.edu](mailto:js-chen@ucsd.edu)

Co-Chair: Prof. Charbel Farhat, Email: [cfarhat@stanford.edu](mailto:cfarhat@stanford.edu)

Co-Chair: Prof. Francisco Chinesta, Email: [Francisco.Chinesta@ensam.eu](mailto:Francisco.Chinesta@ensam.eu)

Co-Chair: Prof. George Karniadakis, Email: [George\\_Karniadakis@brown.edu](mailto:George_Karniadakis@brown.edu)

Co-Chair: Prof. WaiChing Sun, Email: [wsun@columbia.edu](mailto:wsun@columbia.edu)

Website: <https://sites.google.com/eng.ucsd.edu/iacm-mltd-cse>

### **3. Activities carried on by Enrico De Bernardis within the Union during 2021 and impact on the Italian scientific community**

The only activity carried out within the frame of institutional commitments was the participation in the General Assembly meeting. As mentioned above, the meeting was held virtually in two sessions on 22 and 25 August 2021 by electronic means during the virtual 25th ICTAM held in Milano, Italy.

### **4. Evaluation of the participation in terms of benefits and membership cost**

Such an assessment is difficult to achieve. Certainly, the quality and size of Italian participation to IUTAM initiative is an issue to be seriously considered by CNR.

### **5. Evaluation of Italians' attendance and how to improve interest and involvement**

Scientific initiatives mentioned above, organized or sponsored by IUTAM in 2021, have seen an overall significant attendance by the Italian scientific community.

### **6. Italian experts with important roles within the Union or within related Commissions and Programs (if known)**

- Maria Vittoria Salvetti, Congress Committee member, appointed by the General Assembly at ICTAM 2016 (see page 7 of the Newsletter N-2016-2);
- Davide Bigoni, Congress Committee member, appointed by the General Assembly in 2014 (see page 8 of the Newsletter N-2014-2), confirmed in office in 2018 (see page 8 of the Newsletter N-2018-2); member of the Symposia Panel for Solid Mechanics, appointed by the General Assembly in 2020 (see page 6 of the [Newsletter N-2020-2](#));
- Alberto Corigliano, President of ICTAM 2020, member of the Executive Committee of the Congress Committee, appointed by the General Assembly in 2020 (see page 9 of the [Newsletter N-2020-2](#));
- Umberto Perego, Secretary-General of ICTAM 2020, will be invited at the meetings of the Executive Committee, as guest and observer (see page 8 of the Newsletter N-2016-2).
- Giulio Maier, Member-at-Large for the period 2020-2024, appointed by the General Assembly in 2020 (see page 5 of the [Newsletter N-2020-2](#));
- Bernhard Schrefler, Member-at-Large for the period 2020-2024, appointed by the General Assembly in 2020 (see page 5 of the [Newsletter N-2020-2](#)).

### **7. If Union with CNR Commission, short summary about the 2020 CNR Commission activities**

There is no Commission for IUTAM.

### **8. Conclusions**

It is hoped that 2022 will see the expression of interest by CNR people toward initiatives to be launched for the following years. To this aim, diffusion will be given to the call for IUTAM Symposia and summer school to be held in 2024-2025.