



## REPORT ON THE IASS TECHNICAL ACTIVITIES, 2020–2021

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After a one-year stop due to the pandemic, the annual IASS Symposium 2021 took place online, extraordinarily well organized by the Spatial Structures Research Centre of the University of Surrey. Unfortunately, other planned technical events as the ICCT 2022 conference (WG 3) and the 30th biennial WG4 meeting have had to be postponed to 2022; in this last case, a short web meeting was held, in place of the regular one.

The recently approved revision of the IASS Policy on Technical Activities has been launched in 2021. It is rendering positive technical results and fostering the communication of WG activities. These are the highlights:

- Practically all IASS Working Groups contributed to the symposium by organizing successful specific sessions: there were two WG 5 sessions on fabrication and construction of shells and on conservation and preservation of historic shells; one session by WG 6 on recent developments of tension and membrane structures around the UK; two WG 8 sessions on connections and stability, and on the dynamic response of metal spatial structures; a session of bio-based concepts by WG 12, two WG 13 sessions on optimization and on next-generation parametric design; one WG 15 session on transformable structures, one WG 18 session on life-cycle design and assessment of structures; and a session on tactile strategies for teaching by WG 20.
- WG 5 sponsored the first Italian Workshop on Shell and Spatial structures and participated in the Panel “Shell Structures” in Digital Futures.
- The action to re-define the mission of WG 6 and to identify young active members is successfully progressing. Several new members have joined the group and further actions have been planned for 2021-2022.
- WG 13 edited the June 2021 issue of the Journal of the IASS on Computational Methods.
- Ed Saliklis has stepped down as chair of WG 17. The IASS President has appointed Marisela Mendoza (Nottingham Trent University, UK) as new chairperson. Romuald Tarczewski remains as co-chair of the group.
- Corentin Fivet, co-chair of WG 18, is representing the IASS at the Joint Committee of the Globe Consensus.
- The planned pavilion exhibition organized by WG 21 had to be postponed to 2022.

You may find a more detailed summary of the activities of each of the active Working Groups during the yearly period starting September 2020 in the next pages. (Further details may be found in the corresponding WG websites.)

As you know, I have been recently elected President of the IASS. Therefore, I am stepping down as TAC chair after 9 years of office. From these lines, I would like to acknowledge the efforts of all Working Group members and contributors. I am particularly grateful to all current and past WG chairs for their valuable and sustained efforts. It has been a great pleasure to work with you!

*Carlos Lázaro*  
*President of the IASS and Chair of the TAC*

**WG 3 Technical Expert Group on Cooling and Solar Updraft Towers**

**Prof. Dr. Reinhard HARTE (Chair)**

- Aims to expand WG 3 to a larger group of engineers.
- Is organizing joint International Conference on Industrial Construction and Cooling Towers ICCT2022 in Shanghai, China, October 2022 (has been postponed from 2021 to 2022 due to the COVID-19 pandemics), which will be jointly organized by CICIND, the International Association for Industrial Constructions, VGB PowerTech, the Technical Association for Power and Heat Generation and IASS WG 03 in co-operation with Tongji University Shanghai: [www.cicind.org](http://www.cicind.org)
- Current membership: 9 IASS Members

**WG 4 Technical Expert Group on Masts and Towers**

**Eng. Mogens G. NIELSEN (Chair), Eng. D Sankara GANESH (Secretary)**

- The 30th Biennial Meeting of the Working Group for Masts and Towers is postponed due to COVID-19 and will be held in Toronto, ON, Canada 11th - 15th September 2022.
- Because of the postponed meeting, the meetings of the IASS WG4 (TEG) will be held every even year from 2022.
- A web-meeting of 3-4 hours will be held on Monday 13th of September 2021
- Current membership: 30 IASS Members

**WG 5 Concrete Shell Roofs**

**Prof. Sigrid ADRIAENSSENS, Prof. Philippe BLOCK (Co-chairs)**

- The WG was involved in the co-sponsoring of the 1st Italian Workshop on Shells and Spatial Structures, IWSS2020, on-line.
- The co-chairs, representing the WG, were involved in the formulation, design and fabrication of the Isler Award.
- The co-chairs were virtual panelists in 'Shell Structures', a panel held on the digital platform DigitalFUTURES, organised by Tongji University. All WG members were invited to this panel.
- Contributed to the Special Issue on Computational Methods of the IASS Journal
- The WG submitted two sessions for IASS 2021 Symposium at Surrey "21st Century fabrication and construction of shells" and "Conservation and preservation of 20th century historic concrete shells" (with Prof. M. Mendoza and Prof. J. Chilton).
- The group continues to seek opportunities to organize sessions on concrete shell roofs for IASS Symposia and Colloquia and to assemble resources of interest including these in the listings of Resources on the WG 5 web page.
- Current membership: 32 IASS Members

**WG 6 Tension and Membrane Structures**

**Prof. Ken'ichi KAWAGUCHI (Chair), Prof. Marijke MOLLAERT (Co-chair)**

- An action to re-define the mission of the group and identify young active members is ongoing. Several new members have already joined the group.
- The group organizes one session in IASS2021 in Surrey titled "Tension and Membrane Structures: Recent Developments in and around the United Kingdom".
- Current membership: 30 IASS Members

### **WG 8 Metal Spatial Structures**

**Prof. Toru TAKEUCHI (Chair), Prof. Su-Duo XUE (Co-chair), Prof. Shiro KATO, (Co- chair)**

- The group organizes two sessions in IASS2021 in Surrey titled " Metal Gridshell Structures, Connections, and Stability " and "Dynamic Response of Metal Spatial Structures". The sessions reflect the research works and discussions of the WG members through the past two years.
- The WG chair has been interviewed by the IASS social media group in early 2021 introducing the WG activities. The interview is expected to be distributed in the next future.
- The "(Draft) Guide to Earthquake Response Evaluation of Metal Reticulated Roof Structures is now available to IASS members as item 2. of the "Publications" section in the members-only part of the WG 8 site. IASS members are welcome to review the manuscript and submit their opinions.
- Current membership: 22 IASS members.

### **WG 12 Timber and Bio-based Spatial Structures**

**Dr. Andreas FALK (Chair), Prof. Minjuan HE (Co- chair)**

- Organised three special sessions on "Form and Force in Bio-Based Structures and Architecture for the IASS Symposium 2019 in Barcelona
- The WG chair submitted one session for IASS2021 in Surrey titled "Bio-based concepts inspiring the spatial structures and architecture of the next generation".
- Plans to produce a special issue of the Journal of the IASS on "Timber and Bio-based Spatial Structures". Tentative publication date is 2023.
- Plans to increase the network activities within the WG between the annual symposia, by arranging an internal WG workshop for planning of increased interactions and collaboration.
- Plans to collect information on and links to projects on timber spatial structures in an online database.
- Current membership: 10 IASS members.

### **WG 13 Computational Methods**

**Prof. Makoto OHSAKI, Prof. Kai-Uwe BLETZINGER, Dr. Carlos LÁZARO (Co- chairs)**

- The WG co-chairs edited a special issue of the IASS Journal on "Computation of Shell and Spatial Structures" (vol. 62, n.208, 2021).
- The WG organizes two sessions titled "Optimization methods for analysis and design of roof structures" and "Next generation of parametric design" for the IASS 2020 - Surrey 7 Symposium. The second session has been promoted by the newly established study group within WG 13.
- WG co-chairs K-U. Bletzinger and C. Lázaro are co-chairing the 2021 Structural Membranes conference (online).
- A new study group with the topic "Next generation of parametric design" promoted by Dr. Jeroen Coenders has been established within the group.
- Current membership: 19 IASS Members.

### **WG 15 Structural Morphology**

**Prof. Niels DE TEMMERMAN (Chair)**

- The Structural Origami Gathering 2021 was held online in January 2021.
- The Structural Origami Gathering 2021 + ½ is planned online in August 2021.
- The study group on Graphic Statics is organizing a session on Optimized Structural Design at ASCE Structures Congress 2022
- Current membership: 50 IASS Members.

**WG 17 Historical Spatial Structures**

**Prof. Marisela MENDOZA (Chair), Prof. Romuald TARCZEWSKI (Co- chair), Prof. Edmond SALIKLIS (Past Chair),**

- Prof. Ed Saliklis stepped down as WG chair and the new leader of the group, Prof. Marisela Mendoza has been appointed by the IASS President.
- Current membership: 23 IASS Members.

**WG 18 Life-Cycle Design and Assessment of Shell and Spatial Structures**

**Prof. Olivier BAVEREL, Prof. Corentin FIVET (Co- chairs)**

- The WG co-chair Corentin Fivet is joining the Joint Committee on the GLOBE Consensus (promoted by CIB, ECCS, IABSE, IASS, fib and RILEM) on behalf of the IASS.
- Organizes a session on “Lifecycle design and assessment of structures” at IASS 2021 Surrey.
- Is redefining the mission of the Working Group and preparing a roadmap for future activities.
- Plans a special issue of the IASS journal on the life-cycle design of shell and spatial structures.
- Plans to build a list of links to relevant publications on the life-cycle design and assessment of structures.
- Current membership: 5 IASS Members.

**WG 20 Teaching of Shell and Spatial Structures**

**Prof. Olga POPOVIC LARSEN (Chair), Dr. Alireza BEHNEJAD (Co-chair)**

- Alireza Behnejad is chair of the OC of IASS 2021 at the University of Surrey.
- The group organizes a session on “Tactile Strategies for Teaching Spatial Structures” at IASS 2021 Surrey.
- Current membership: 27 IASS Members.

**WG 21 Advanced Manufacturing and Materials**

**Dr. Arno PRONK (Chair), Dr. John ORR (Co-chair)**

- The 3<sup>rd</sup> Competition and Exhibition of Innovative Lightweight Structures at the IASS 2021 - Surrey 7 Conference has been postponed due to the pandemic.
- The group is organizing a session on “Fabric Formwork” at the 2021 Structural Membranes conference (online).
- Current membership: 19 IASS Members.