



REPORT ON THE IASS TECHNICAL ACTIVITIES, 2018–2019

Dr. Carlos LÁZARO

Chair of IASS TAC, Associate Professor, Universitat Politècnica de València,
Camino de Vera s/n 46022 Valencia (Spain)
carlafer@mes.upv.es

1. INTRODUCTION

The annual report of the Technical Activities Committee (TAC) summarizes the main activities, results and news related to the IASS Working Groups (WGs).

The IASS policy on Technical Activities includes the organization of Working Group sessions during IASS annual Symposia and the reporting of WG activities in the website of the Association.

Besides the organization of sessions in the annual Symposia, Working Groups carry out diverse technical activities ranging from the organization of scientific meetings to the preparation of guidelines, reports or scientific papers, as well as the edition of special issues of the Journal of the IASS. You may find more detailed information about WG membership, organization and activities in the IASS website, and in previous TAC reports available under the Technical Activities menu tag.

All IASS members have full access to the Working Group webpages. An abridged presentation of Working Group activities for non-members is available on the public part of the website. WG webpages include information about mission, objectives, activities and membership of each group, as well as links to relevant related documentation.

last November 2019) communicated in March 2019 his wish to step down as chair of the WG. The IASS President and the Executive Council expressed the deep gratitude of the Association for the continued efforts of Prof. Shaeffer. WG 6 continues its activities under the leadership of Prof. Ken'ichi Kawaguchi and Prof. Marijke Mollaert.

- **WG 8 – Metal Spatial Structures.** A special committee of the WG completed the "(Draft) Guide to Earthquake Response Evaluation of Metal Reticulated Roof Structures". It has been approved at the EC meeting held during IASS 2019 in Barcelona and is now available to IASS members as item 2. of the "Publications" section in the members-only part of the WG 8 site.

2.2. Summary of Working Group activities

A summary of the main activities of each of the active Working Groups during the yearly period ending with the 2019 Barcelona Symposium is included in the following pages. Further details may be found on the corresponding WG website.

2. ACTIVITIES DURING 2018-2019

2.1. News related to the Working Groups

- **WG 6 – Tension and Membrane Structures.** Prof. Ron Shaeffer (who sadly passed away

WG 3 Technical Expert Group on Cooling and Solar Updraft Towers

Prof. Dr. Reinhard HARTE (Chair)

- Participated in the 90th CICIND Conference in Graz, Austria, October 21-23, 2018
- Participated in the 91st CICIND Conference in Madrid, Spain, May 9-12, 2019
- Continues to expand the objectives of WG 3 to include updraft towers of solar thermal power plants.
- Is working on a new edition of the VGB Standard VGB-S 612 *Structural Design of Cooling Towers*.
- Organizes the *International Conference on Industrial Chimneys and Cooling Towers ICCT2019* in Edinburgh, UK, Oct. 9-12, 2019, jointly organized by CICIND, the International Association for Industrial Chimneys, VGB PowerTech, the Technical Association for Power and Heat Generation and IASS WG 3.
- Current membership: 11 IASS Members

WG 4 Technical Expert Group on Masts and Towers

Eng. Mogens G. NIELSEN (Chair), Eng. Rasmus CHRISTENSEN (Secretary)

- The 29th Biennial Meeting of the Working Group for Masts and Towers was held successfully in Winchester, UK, in September 8th - 12th, 2019. The meeting was arranged by Arqiva, who owns the broadcast antenna masts and towers in the UK.
 - 55 Participants
 - 19 different countries
 - New members (8 participating for the first time)
 - 2 new countries (Estonia and Romania) represented.
 - 32 different presentations
 - 3 full days with technical sessions and 1 day technical excursion
- The next (30th) Meeting of the Working Group is to be held in Toronto, ON, Canada, September 2021.
- Current membership: 37 IASS Members

WG 5 Concrete Shell Roofs

Prof. Sigrid ADRIAENSSENS, Prof. Philippe BLOCK (Chairs)

- Organized a session titled "Actual structural behavior of thin shells" and contributed to the session "Preservation and reuse of reinforced concrete shells" (organized by Prof. Chilton) at IASS 2019, Barcelona.
- 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: 35 IASS Members

WG 6 Tension and Membrane Structures

Prof. Ken'ichi KAWAGUCHI (Chair), Prof. Marijke MOLLAERT (Co-chair), Prof. Ronald SHAEFFER[†] (past Co-chair)

- Organized two special sessions titled "Contemporary tensile structures of Europe" and "Reliability analysis of membrane structures" at IASS 2019, Barcelona.
- Organized a special plenary session titled "State-of-the-art and future on membrane structures" –with presentations by Profs. Bletzinger and Mollaert– as a starting point to re-define the objectives of the group.
- Current membership: 24 IASS Members

WG 8 Metal Spatial Structures

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

- Organized a special session titled “Stability and dynamics of metal gridshell structures” at IASS 2019, Barcelona.
- After the publication of “(Draft) Guide to Buckling Load Evaluation of Metal Reticulated Roof Structures” in 2014, a special committee of the WG completed the “(Draft) Guide to Earthquake Response Evaluation of Metal Reticulated Roof Structures”. The document has been approved at the EC meeting held during IASS 2019 in Barcelona and is now available to IASS members as item 2. of the “Publications” section in the members-only part of the WG 8 site.
- Current membership: 26 IASS members.

WG 12 Timber and Bio-based Spatial Structures

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

- Organized a special session titled “Form and force in bio-based structures and architecture” at IASS 2019, Barcelona.
- 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 produce a special issue of the Journal of the IASS on “Bio-based and Bio-Inspired Environmentally Compatible Structures”.
- Current membership: 17 IASS members.

WG 13 Computational Methods

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

- Prof. Bletzinger and Dr. Lázaro co-chaired (with Prof. Oñate) the joint conference *Form and Force* (IASS Symposium 2019 – Structural Membranes 2019) in Barcelona.
- Organized a special session titled “Form-finding/force-finding of tension structures using novel computational methods” and co-organized a special session titled “Wind engineering and fluid-structure interaction” at IASS 2019, Barcelona.
- Current membership: 22 IASS Members.

WG 15 Structural Morphology

Prof. Niels DE TEMMERMAN (Chair)

- The Structural Origami Gathering 2019 was held in Stuttgart Germany, from January 16th to January 20th, 2019, organized by Yves Klett. 12 people joined the workshop.
- Organized special sessions on “Structural origami”, “Design and analysis of bending-active structures”, “Graphic statics / Reciprocal diagrams”, “Transformable structures” and “Constructive geometry for structural design” at IASS 2019, Barcelona.
- Plans to organize a WG workshop at IASS 2020 – Surrey 7
- Current membership: 65 IASS Members.

WG 17 Historical Spatial Structures

Prof. Edmond SALIKLIS (Chair), Dr. Romuald TARCZEWSKI (Co- Chair)

- Contributed to the session “Preservation and reuse of reinforced concrete shells” (organized by John Chilton) at IASS 2019, Barcelona.
- Current membership: 24 IASS Members.

WG 18 Environmentally Compatible Structures

Prof. Olivier BAVEREL (Co- Chair), Prof. Corentin FIVET (Co- Chair)

- Organized a special session titled “Improving and assessing the life cycle of structures” at IASS 2019, Barcelona.
- Is redefining the mission of the Working Group and preparing a roadmap for future activities.
- Current membership: 14 IASS Members.

WG 20 Teaching of Shell and Spatial Structures

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

- Organized a special session titled “Embracing inter-/crossdisciplinarity through new roles, methods and tools for design and fabrication of spatial structures” at IASS 2019, Barcelona.
- Organized a workshop on physical form finding at the Khayam University, Iran.
- Organized two workshops on membrane structures for undergraduate students at the Emei Campus and postgraduate students at the Chengdu Campus of the Southwest Jiaotong University, China.
- Supported the organization of the two-day special course on teaching structures at the Ecole des Ponts ParisTech in June 2019 and delivered a welcome talk to discuss the activities of the WG 20.
- Attended the Structure and Architecture Symposium in Lisbon and through discussions encouraged people to attend the IASS 2019 in Barcelona.
- The ReciPlyDome structure was exhibited in several public locations in Denmark, with one of the iterations of the structure being able to withstand the weather for one year. It has evoked interest in the structural system and in spatial structures.
- Organized a two-day workshop on spatial structures with students at KADK during September 2019.
- Is participating in the organisation of the IASS 2020 Symposium at the University of Surrey, UK in August 2020
- Current membership: 34 IASS Members.

WG 21 Advanced Manufacturing and Materials

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

- Organized a very successful competition for innovative pavilions at the IASS 2019 Barcelona Symposium, that included presentations of the pavilion design and conception by each team in a dedicated track. More than 30 teams from many countries participated in the contest.
- Is organizing the 3rd Competition and Exhibition of Innovative Lightweight Structures at the IASS 2020 - Surrey 7 Conference.
- Current membership: 23 IASS Members.

3. FINAL REMARKS

IASS Working Groups are the center of the technical and scientific activities of the association. They evolve and adapt to new fields of interest and action of IASS members. I would like to acknowledge the efforts of all Working Group chairs in coordinating the WG activities, recruiting members, preparing reports and technical documentation, and contributing the Organized Sessions at the various recent Symposia. **I encourage all IASS members to participate in the Working Group activities!**