



Working Group 21: Advanced manufacturing and materials

International Association for Shell and Spatial Structures

www.manufacturingmaterials.org

Competition and exhibition of innovative lightweight structures: An invitation for artists, designers, engineers, and researchers

Organized by the new **IASS Working Group 21 “Advanced manufacturing and materials”**
in close cooperation with

the IASS Symposium 2020 and the 7th international conference on Spatial Structures in Surrey.

1 61 years IASS and 3rd WG21 Expo

After the success of the 2015 IASS expo in Amsterdam and the 2019 expo in Barcelona, WG21¹ is organising a new exhibition to celebrate this success during the annual international symposium of the IASS and the 7th international conference on Spatial Structures. The expo, symposium and conference will take place in **Surrey from 24 to 28 August 2020**.

2 Invitation

Internationally recognized and celebrated artists, designers, engineers, and researchers in cooperation with top universities from all over the world are invited to participate in a contest and exhibition of innovative lightweight structures. The structures must display a strong vision of structural design and innovation. They should demonstrably be the result of structural engineering focused research projects. It is our ambition to have an exhibition that shows new insights on structural typologies, through the design of a pavilion. The pavilions will be exhibited during the joint IASS - Spatial Structures 2020 symposium in Surrey UK. During the conference the jury of the contest, will award a prize to the most innovative realized structure.

The winning team will be awarded a prize of €1000 and certificate signed by the jury.

3 Competition brief

The competition brief is to design an innovative lightweight pavilion/structure. The structure will stand outside at the venue of the University of Surrey. There are no maximum external dimensions but it has to be transportable by airplane. Therefore it has to fit into six boxes each with a maximum external size of 1x0.75x0.65m and maximum weight of 32kg (total pavilion 192kg). The structure should reflect structural engineering research of the submitting team. Each structure will be judged by examining the production techniques, materiality, and level of structural innovation, constructability, transportability, architectural expression, overall originality, and transfer with art of the finished pavilion. The choices of materials, manufacturing methods, erection techniques, and so forth are at the entire discretion of each team. Innovative ideas and prototype methodologies that push the boundaries of construction are strongly encouraged.

¹ WG21 is a new working group within IASS concerning advanced manufacturing and materials for more information please see: <http://www.manufacturingmaterials.org/>



4 Competition entries

All entries to the competition are made by completing the online application form available on the WG21 website, www.manufacturingmaterials.org.

5 Competition timeline

The pavilion contest consists of three phases:

Phase 1 – Initial proposals

- Provision of design rules and other conditions.
- **9 October 2010 at 11 am** info meeting by WG21 in Barcelona (crown plaza hotel, Verdi sale)
- **November 2019**: The expo venue will be provided on website.
- **23th December 2019**: Submission of initial team proposals, allowing safety check by local authorities (it is possible to submit a preliminary design first and the final design later.)
- **31st January 2020**: Acceptance of proposals and payment of contribution. WG21 (the organizers will send an invoice to the team or sponsor of the team.

Phase 2 – Detailed design and construction

- **February-August 2020**: Realization by each team of their pavilions as a “transportable kit”.
- **Monday 17 august – Saturday 22 August 2020**. Building of pavilions in Surrey, undertaken by each team.

Phase 3 – Exposition

- **Monday 24th August 2020** Official opening of the exposition
- Exposition and paper session during IASS and the 7th international conference on Spatial Structures Symposium.
- Award ceremony during closing of the Symposium.
- Day after symposium removal of pavilions by each teams, **29 August 2020**.

5.1 Publications

During the symposium in Surrey there will be a special session organized by WG21 about the exposition. All participants will be invited to submit a paper about their pavilion. Papers will be reviewed by the scientific committee of the symposium. After acceptance, papers will be published in the symposium proceedings. A special issue of the IASS journal on the 2019 exposition and 2020 expo is planned in 2020. Participants will be invited to submit a paper for this special issue of the IASS journal.

6 Jury

During the 2020 Symposium the jury will select one winning pavilion. The prize of €1000 will be awarded at the symposium. The jury will judge the structural pavilions against the following criteria:

- Structural innovation
- Materiality
- Production methods
- Constructability
- Transportability
- Expression



- Originality
- Transfer with art

The jury will be recruited from:

- Organizers of the symposium
- Symposium scientific committee
- Board of IASS

7 Costs

The cost for the exhibited structures and organization of the expo will be covered in full by the participating teams. The teams are allowed to invite participating companies, universities etc. to contribute to the exposition by sponsoring in money or in kind (materials and services).

The designs may be produced and realized in cooperation with the supporting company. Companies will have the opportunity to highlight their contribution by showing logos and by providing information about their activities during the Expo. The fee for the participating teams will be calculated using the following formula:

- Fee = €500 euro minus $0.025 \times$ the distance to London in kilometres².
- The distance between the cities can be calculated at this website:
<https://www.timeanddate.com/worldclock/distance.html>

For instance, the participation fee for a team from Paris, will be €491.40; for a team from Melbourne it will be €77,52. This fee is for entry to the **competition only** and does not include registration at IASS 2020.

At least one member of every participating team must represent the team at the symposium in Surrey in 2020 by registering as a presenting author and paying the corresponding registration fee.

8 Practical matters and conditions

1. The contest is open for all participants: artists, architects, engineers, universities, students, professors, companies, groups, individuals, etc.. All pavilions have to be prefabricated in the workshop of the participants and transported to the Surrey venue by the participating teams.
2. All structures will be standing on the ground.
3. The material used has to fit in six (imaginary) boxes that can be transported as “regular” luggage by an airplane, i.e. a maximum of 1x0.75x0.65 m/32 kg per box. The maximum weight is 192 kg. This also applies to the teams in the UK. The teams have the option to produce elements at fab-labs in UK as long as size and weight of all the elements satisfy the above-mentioned criteria.³
4. The venue of the exhibition will announced in autumn 2019 and will be outdoor at the venue of the University of Surrey. There will be space for at least 15 pavilions. There is no maximum size of the envelope for the structure. All pavilions will be standing on the ground. (There is no possibility for suspended pavilions). Electricity for the pavilions (lighting, sound or electrical motors, etc.) can be supplied if requested.

² This fee is to cover the expenses for the organization of the expo, opening, etc. Participation of the symposium is not included. At least one of the team members has to attend the symposium and register as presenting author.

³ We recommend the participants to contact the organization that will be responsible for the transportation of your structure to be sure about the conditions for transportation.



5. Irrelevant or impossible proposals may be refused⁴.
6. The jury will invite only the proposals with the highest quality to be erected in Surrey.
7. WG21 reserves the right to cancel the exposition or withdraw the prize for the winner as promised in case of financial shortage due to a lack of sponsorship or participants.
8. From autumn 2019 teams can ask WG21 to provide a (digital) 3D model of the expo venue. Teams can ask for a particular place for their pavilion on the venue. The organization will allocate the places in order of entry. The location of the pavilion will be confirmed definitively after payment of the competition fees.
9. The participating teams are responsible for the transportation, packing and transportation costs of the pavilion. They should deliver the materials and services necessary to realize the pavilions on site.
10. The participating teams must ensure the safety of their pavilion. Each team will be required to sign a document about the safety, ownership and responsibility of the pavilion prior to its erection. The organisers have the right to refuse the exposition of the submitted pavilion in case of danger and if the realized pavilion on the symposium is essentially different from the proposed pavilion in December 2019.
11. The proposal submitted before 23 December 2019 will be checked by the facility department of the venue, the organization of the contest and local authorities on safety. Teams will be required to respond to any comments from local authorities.
12. All the pavilions will be published in a digital catalogue of the contest and exhibition. The winning pavilion will be published in international magazines on design, architecture and structure.
13. The teams are free to find sponsoring for the realization of their pavilion. The names of the supporting sponsors can be displayed at the exhibition of the pavilion, the online community and catalogue.
14. The pavilions remain property of the teams during the exhibition. The venue may be open to the public 24/7. The organisers of the exhibition are not responsible for any damage done to a pavilion by visitors. Further, the organization of the exhibition is not responsible for any damage on the expo venue or injuries to the visitors related to the exhibition of the pavilions.
15. After the symposium the pavilions have to be removed from the expo and disposed of according to local regulations. Any costs associated with removal or disposal are the responsibility of the team.
16. In the case of dispute between the jury, the organization of the contest and a team, an arbitrator has to be found that is acceptable to all parties. This arbitrator will be a member of the scientific committee of the 2020 symposium in Surrey.

9 Correspondence

This contest is organized by IASS Working Group 21 in close cooperation with the symposium organisers of the University of Surrey. The complete information about the contest, rules, jury, etc. will be announced on our website www.manufacturingmaterials.org.

⁴ The jury will decide about the relevance of the pavilion. The jury is not obligated to give a reason or explanation for their decision.