



## **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 2022 and and Asia-Pacific Conference on Spatial Structures (APCS)  
2022 in Beijing China.**

62 years IASS and 4rd WG21 Expo

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After the success of the 2015 IASS expo in Amsterdam the 2019 expo in Barcelona and 2021 expo in Surrey, WG21<sup>1</sup> is organizing a new exhibition to celebrate this success during the annual international symposium of the IASS and Asia-Pacific Conference on Spatial Structures (APCS) 2022 in Beijing China. The expo, symposium and conference will take place in **Beijing from 19 – 23 September 2022.**

### **1 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 in September 2022 during the joint IASS - Asia-Pacific Conference on Spatial Structures 2022 symposium in Beijing China. During the conference the jury of the contest, will award several a prizes to the most innovative realized structures.

**The winning teams will be awarded with a total prize of €1000 and certificate signed by the jury.**

### **2 Competition brief**

The competition brief is to design an innovative lightweight pavilion/structure. The structure will stand at the venue of the Beijing University of Technology. There are no maximum external dimensions but it has to be transportable by airplane. Therefore it has to fit into six boxes that can be transported by an airplane. 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.

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



### 3 Competition entries

All entries to the competition are made by completing the online application form available on the WG21 website, [www.manufacturingmaterials.org](http://www.manufacturingmaterials.org).

### 4 Competition timeline

The pavilion contest consists of three phases:

#### Phase 1 – Initial proposals

- September 2021: Provision of design rules and other conditions.
- October 2021: 2D model of the expo venue will be provided on website.
- **28<sup>st</sup> February 2022**: 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.)
- **1<sup>th</sup> March 2022**: 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

- March-August 2022: finishing of the Design and realization by each team of their pavilions as a “transportable kit”. This stage will include detailed design submissions to IASS and WG21.
- **Thursday 15<sup>th</sup> September – Sunday 18 September 2022**. Building of pavilions in Beijing, undertaken by each team.

#### Phase 3 – Exposition

- Official opening of the exposition **Monday 19 September 2022**
- Exposition paper session during IASS Structural Membranes Symposium.
- Award ceremony during closing of the Symposium.
- Removal of pavilions by each team, **23 September 2022**.

### 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 (not by WG21). After acceptance, papers will be published in the symposium proceedings. For the time line of the paper submission please look at the website of the 2021 Surrey symposium. A special issue of the IASS journal on the 2019 exposition and 2021 expo is planned to be published in spring 2022. All participants are invited to submit a paper for this special issue of the IASS journal.

### 5 Jury

During the 2021 Symposium the jury will select Three winning pavilions. The total 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 consist of:

- Mark Burry
- Ruy Pauletti
- Kai-Uwe Bletzinger
- Peng Luo
- Sigrid Adriaenssens
- Jinzhi WU

## 6 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 = €1000 euro minus  $0.025 \times$  the distance to Beijing in kilometres<sup>2</sup>.
- 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 €794 for a team from Buenos Aires, Argentina it will be €518. This fee is for entry to the **competition only** and does not include registration at IASS 2022.

At least one member of every participating team must represent the team at the symposium in Beijing in 2022 by registering as a presenting author and paying the corresponding registration fee.

## 7 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 luggage by an airplane. This also applies to the teams in China. The teams have the option to produce elements at fab-labs in China as long as all the elements satisfy the above-mentioned criteria.<sup>3</sup>
4. The venue of the exhibition will announced in Autumn 2020 and will be outdoor and or indoor at the venue of the Beijing University of Technolgy. 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.

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<sup>2</sup> 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.

<sup>3</sup> 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 refused<sup>4</sup>.
6. The jury will invite only the proposals with the highest quality to be erected in Beijing.
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 2021 teams can ask WG21 to provide a (digital) 2D 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 January 2022.
11. The proposal submitted before 31 January 2021 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.
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 2021 symposium in Surrey.

## 8 Correspondence

This contest is organized by IASS Working Group 21 in close cooperation with the symposium organisers of the Beijing University of Technology. The complete information about the contest, rules, jury, etc. will be announced on our website [www.manufacturingmaterials.org](http://www.manufacturingmaterials.org).

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