

Organized Session (OS) “Symmetry and Spatial Structures”

Organizers:

Janusz Rebielak, Retired Professor, Cracow University of Technology, Poland.
E-mail: j.rebielak@wp.pl

Alphose Zingoni, Professor, University of Cape Town, South Africa.
E-mail: alphose.zingoni@uct.ac.za

The notion of symmetry exists in almost all fields of human knowledge. In ancient Greece, symmetry manifested itself in art and science. In modern times, concepts of symmetry have played an important role in the understanding of natural phenomena, leading to fundamental discoveries in mathematics, physics, biology, chemistry etc. Spatial structures belong to the group of modern and very efficient structural systems applied in architecture and civil engineering. They are mostly very regular structures, but due to their 3-dimensional configuration, the analysis and design of spatial structures can be complex and very difficult. Symmetry can be exploited not only to simplify the understanding of the physical behaviour, but also as a powerful tool for the creation, analysis, design and assembly of spatial structures.

The session on “Symmetry and Spatial Structures” is intended to be a platform for the exchange of ideas and experience on symmetry between experts involved in the analysis, design and construction of spatial structures. The following types of contributions are welcome:

- (i) Papers presenting new mathematical procedures and algorithms for the identification of symmetry, and for taking into account symmetry and regularity in spatial configurations;
- (ii) Original contributions on novel methods of structural analysis that exploit symmetry and regularity in spatial structures in order to simplify the analysis;
- (iii) Studies of the influence of symmetry on structural behaviour (statics, kinematics, stability, buckling and vibration), or seeking a better understanding of phenomena related to symmetry;
- (iv) Contributions presenting the creative use of symmetry as a tool for the design and assembly of new types of spatial structures, or for the adaptation of existing structures;
- (v) Studies bringing in diverse experiences on symmetry from other scientific disciplines, and indicating the relevance of these to the design of spatial structures.