Third MIT Conference on Computational Fluid and Solid Mechanics

Minisymposium

'Static and dynamics of cellular solids: modelling aspects and numerical strategies'

Session organizer: Pr. J.F. Ganghoffer, LEMTA, Nancy, France.

Scientific scope:

Cellular solids have fostered an increasing number of research activities and technological developments in the last decade. Metal foams, for instance, are emerging as a new class of engineering materials, to be used as energy absorbers in packaging and in vehicles, while their low density makes them attractive as core material for structural sandwich panels.
Cellular solids inherit their good (thermo)mechanical properties directly from their network-like microstructure. The overall mechanical behaviour depends on i) the properties of the constituting solid, ii) the porosity and iii) three-dimensional morphological information of the network architecture.
The goal of the Minisymposium is to cover the different modelling strategies of these materials, and to present the recent development in terms of numerical simulations.

Topics of the Symposium :

Nature of the materials / media being studied :
- Cellular materials (polymeric and metallic foams) ;
- Reticulated structures ;
- entangled materials (paper ; wool)
- fiber composites/materials

Modelling & numerical strategies :
- discrete (network models) models vs. continuous models - Cosserat media ; enhanced continuum theories ;
- homogenization of discrete media ;
- numerical simulations (according to the modelling strategy)

Mechanical behaviour :
- effective properties ;
- appearance of internal lengths ;
- stability and buckling ;
- damage and failure
- impact behavior