

Colloquium n. 584 - Multi-uncertainty and multi-scale methods and related applications

Dates and location

14 September — 16 September 2016, Portugal

Chairperson

Prof. Andrade Pires

Co-chairperson

Dr. Chenfeng Li

What other funding was obtained?

No other funding was received.

What were the participants offered?

Something

Something else.

Scientific report

The development of multi-uncertainty and multi-scale models has received significant attention over the last decade. New mathematical formulations and numerical solution strategies allied to the increase in computational power/cost ratio have fostered a dramatic growth in this rapidly expanding field. Research activity in this area has been devoted to the development and combination of different analytic tools (homogenization, asymptotic analysis) and computational methods (parallel computing, stochastic analysis, code coupling) for application in fields as diverse as metal processing, composite materials, oil & gas development, fuel cell technology and biomedical tissue engineering etc. Such developments have played a central role in the understanding of the interaction among multi-physics and multi-uncertainty phenomena taking place at multiple scales in space and time. Nevertheless, new challenges remain emerging mainly driven by advanced industrial applications, and these outstanding challenges continue to drive the most forefront research in computational mechanics and computational engineering.

It is also true that in many scientific and engineering problems, the challenges associated with multi-scale and multi-uncertainty often arise together and even coupled, and therefore a synthesized solution approach is required. In the most general format, the proposed Colloquium timely targets the latest advances in the modelling of multi-uncertainty in multi-scale problems. The main aims of the colloquium are:

- (a) To present the state-of-the-art in this field by showing the most recent developments by leading experts, and
- (b) To provide a forum for discussion of current research trends and future challenges in computational multi-uncertainty and multi-scale modelling.

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