

## UNCERTAINTY QUANTIFICATION IN MATERIALS SCIENCE AND COMPUTATIONAL MECHANICS

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### ABSTRACT

The numerical modeling, simulation and identification of random heterogeneous materials play an ever-growing role in materials science and give rise to many appealing engineering and scientific challenges for the design of innovative metamaterials or the characterization of real-world existing materials, such as e.g. sedimentary rocks, natural composites, fiber- or nano-reinforced composites, some concretes and cementitious materials, some porous media, some living biological tissues, among many others.

This Minisymposium aims at presenting the recent developments on Uncertainty Quantification in random linear and nonlinear materials, their quantification and propagation through computational models as well as the statistical inverse identification of their probabilistic models using stochastic optimization methods. Data-driven scientific machine learning and probabilistic learning methods with applications in the scope of this Minisymposium are also welcome. Practical applications and demonstration problems may concern, among others, linear and nonlinear random material models, involving e.g. plasticity, damage or fracture mechanisms or other material non-linearities, in uncertain linear and nonlinear computational mechanics for (quasi-)static or dynamic analyses.