

## Seminar im Rahmen des GRK 2078

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Referee: **Jun.-Prof. Benedikt Kriegesmann**  
Working Group Structural optimization for lightweight design (M-EXK1)  
TU Hamburg, Germany

Date: Tuesday, December 15, 2020  
Time: 14:00 h  
Format: IRTG Online-Seminar

Title: **Multiscale and multiphysical simulation of composites under uncertainty**

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### Abstract

The properties of composite structures show relatively large scatter compared to other materials. In industrial practice, this is accounted for by reducing the theoretical stiffness and strength by knockdown factors and safety factors. This concept implies the assumption that all worst case scenarios occur at the same time (e.g. worst material quality, worst temperature condition, worst geometric deviation, ...). Probabilistic analyses allow to predict the stochastic distribution of the structural response (stiffness and strength) due to the scatter of input parameters (e.g. material parameters, geometry, ...). In the design of composites structures, probabilistic approaches provide huge potential to reduce conservatism and therefore, to design more lightweight.

Scattering effects occur on different scales. While, for instance, geometric deviations are modelled on the component level, variations of the fiber architecture must be modelled on a smaller scale. Considering both types of effects requires a probabilistic multiscale analysis. Taking into account effects like varying temperature conditions furthermore requires a thermomechanical coupled simulation. In the present talk, the concept of a probabilistic multiscale and multiphysical simulation of composite structures is presented.

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Alle Interessenten sind herzlich eingeladen.

Prof. Dr.-Ing. Thomas Böhlke  
(Sprecher des GRK 2078)