



The ICAMS Seminar presents

**Dr. Daniel Balzani**

joint work with:

**Prof. Dr. Jörg Schröder, Dipl.-Ing. Dominik Brands**

Institut für Mechanik  
Fakultät für Ingenieurwissenschaften  
Universität Duisburg-Essen

Monday, 10th of May, 4:00 p.m.  
ICAMS Seminar room UHW 11/1102

## **FE<sup>2</sup>-Simulation of Two-Phase Steels based on Statistically Similar RVEs**

For the direct incorporation of micromechanical information the FE<sup>2</sup>-method provides a suitable numerical framework, by taking into account an additional microscopic boundary value problem based on representative volume elements (RVE). We propose to construct more efficient statistically similar RVEs (SSRVEs) by minimizing a general least-square functional. This functional takes into account the differences between suitable statistical measures characterizing the inclusion morphology, which are computed for a given real (complex) microstructure and for a suitably parameterized SSRVE. It turns out that the combination of the volume fraction and the spectral density seems not to be sufficient, thus, the lineal-path function is additionally included. Then promising results are obtained and analyzed in inhomogeneous macroscopic boundary value problems.