



INTERDISCIPLINARY CENTRE FOR
ADVANCED MATERIALS SIMULATION

The ICAMS Seminar presents

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Monday, 21st of June, 4:00 p.m.
ICAMS Seminar room UHW 11/1102

Mechanisms of Fatigue Crack Initiation and Propagation in Metallic Engineering Alloys at Very High Numbers of Cycles

The majority of dynamically high-loaded components are designed by applying the total-life concept using Wöhler data. More recent research studies have shown that this kind of fatigue life assessment might be non-conservative, i.e., materials may fail beyond the "fatigue limit". Besides a general view on the Wöhler and the fracture mechanics concepts in structural integrity, the presentation will be focussed on the experimental correlation between the material's microstructure and the most relevant crack propagation mechanisms during fatigue loading at load levels close to the fatigue limit (high cycle fatigue and very high cycle fatigue, HCF and VHCF). The experimental results are discussed in terms of a mesoscopic modelling concept, where local plastic deformation at individual slip planes is treated by means of a boundary element approach.