

## Mechanik-Seminar

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Referent: **Prof. John Borg**  
Associate Professor Mechanical Engineering  
Marquette University, Milwaukee, WI, U.S.A.

Datum: Donnerstag, 10. Mai 2012  
Uhrzeit: 15:45 Uhr  
Ort: Geb. 10.23, 1. OG, SR 1

Thema: **Mesoscale Simulations of Heterogeneous Materials Undergoing Dynamic Loading**

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**Abstract** With the advent of increased computing power, mesoscale simulations have been used to explore constituent subscale material phenomenology such as friction, fracture and phase change and their influence on the bulk response of heterogeneous systems over a range of scales from  $10^{-6}$  to  $10^{-2}$  meters.

This talk presents an overview of mesoscale techniques as applied to several types of system configurations including foam, porous and filled granular systems which are composed of a variety of constituent materials including tungsten carbide (WC) and WC-epoxy mixtures, wet and dry sand, and reactive materials. The simulations are compared to experimental data obtained from a variety of strain-rate regimes including Hopkinson bar, one-dimensional planar and spherical shock configurations. This talk will focus on relating mesoscale modeling to experimental data and the role of subscale phenomena and material constitutive behavior on the bulk response of the system. In addition, lessons learned during these explorations, modeling techniques, strengths and weaknesses of hydrodynamic mesoscale simulations will also be presented.

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Alle Interessenten sind herzlich eingeladen.  
Prof. Dr.-Ing. Thomas Böhlke