

Seminar im Rahmen des GRK 2078

Referee: **Prof. Dr. Chris Eberl**
Deputy Director, Meso and Micro Mechanics, Fraunhofer Institute for
Mechanics of Materials IWM, Freiburg Germany

Date: Tuesday, November 20, 2018
Time: 14:00 h
Location: Bldg. 10.23, 3rd Floor, Room 308.1 (KM-Seminar Room)

Title: **The Digital Transformation in Materials Science and Engineering**

Abstract

Digital transformation increasingly impacts society as a whole, even if future developments are still difficult to predict. Nevertheless, it is already obvious that information is becoming increasingly available across domains or disciplines through Open Data initiatives, sophisticated analytical tools, Machine learning and artificial intelligence and simply 'apps'. As a result, increasingly complex interrelationships can be accessed.

Therefore, the knowledge and know-how about material behavior needs to be made available from product design through production processes to their usage. This is the only way to accelerate application development, make production processes more flexible and enable new services such as physics based predictive maintenance.

To tackle the increasing information flow associated with this development, projects have been started to structure and standardize data and information by the use of a common ontology and use knowledge graph-based databases. Furthermore, validated physics based material models and statistical representations (e.g. generated by machine learning, artificial intelligence) allow to predict the future behavior and perform status updates in real time.

In the future it will be possible to develop relationships between manufacturing processes, properties and materials behavior under complex load conditions and to apply these in the form of new business models in industry (e.g. online lifetime assessment coupled with predictive maintenance).

In order to be able to exploit the potential of digital transformation in materials technology, it will be necessary to work together in a so far unfamiliar way to achieve this goal. The necessary next steps, their feasibility and first implementations will be presented and discussed.

Alle Interessenten sind herzlich eingeladen.

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