



Special lecture on

“Functional Nanoscaled Silicon-Based Ceramics and Ceramic Composites via Molecular Design”

Prof. Dr. Ralf Riedel
Technische Universität Darmstadt, Germany

Date: May 30th, Wednesday, 2018

Time: 13:30 – 14:30

Room: 1F meeting room, Building R3

Abstract:

This presentation is devoted to concepts for the synthesis of novel multifunctional ceramics and ceramic-based composites with a tailor-made nanoscaled structure. Industrial demands on future technologies have created a need for new material properties which exceed by far those of materials known today and which can only be produced by designing the respective microstructure at a nanoscale. In particular, molecularly derived amorphous and polycrystalline ceramics have to be considered as novel material classes and are produced by means of cross-linking routes in various states of condensation. Possible fields of application for materials produced at a nanoscale are key technologies of the 21st century such as transport systems, information technology, energy as well as environmental systems and micro- or nano-electromechanical systems. In particular nanostructured polymer-derived ceramics for applications in Li-ion batteries, high-temperature resistant nano-sized carbides and nitrides with a variety of integrated functional (sensing, electrical and thermal conductivity, piezoresistivity, etc.) and mechanical (ultra-high hardness, creep resistance, etc.) properties suitable for e.g. environmental and thermal barrier coatings (EBC and TBC) will be highlighted and discussed.

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