

EUROMAT 2021

EUROPEAN CONGRESS AND EXHIBITION
ON ADVANCED MATERIALS AND PROCESSES

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12. - 16. SEPTEMBER 2021

GRAZ, AUSTRIA

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Area D: Characterization and Modelling

Symposium D2:

Title: Characterization of advanced ceramics and composites		
Organizer	Institution	Contact email
Csaba Balazsi	Center of Energy Research Budapest, Hungary	balazsi.csaba@energia.mta.hu
Andreja Gajovic	Rudjer Boskovic Institute Zagreb, Croatia	Andreja.Gajovic@irb.hr
Monica Ferraris	Politecnico di Torino, Italy	monica.ferraris@polito.it
Abstract		
<p>Scope This symposium aims to give a brief overview of the features of advanced ceramic and composite microstructure and the corresponding techniques for characterizing them. The most widespread tools for characterization of ceramic microstructures are microscopic techniques involving different types of electron microscopy, various diffraction, spectroscopic and nuclear methods.</p> <p>Description Multi-scale characterization from the atomic to nanoscale dimensions is of high interest as it is becoming more important in understanding the synthesis and performance of advanced ceramic and their composites. A great amount of scientific research has been performed to limit the effect of their intrinsic brittleness and to understand the deformation and failure modes. Moreover, recent advances to understand, control and design ceramics and composites at the nanoscale have been achieved, but the long-term mechanical reliability remains a critical issue for successful applications in different industrial areas. Ceramics and ceramic matrix composites are candidates for many applications that involve high temperatures, chemical reactivity or mechanical stresses. In recent years, a number of oxide and non-oxide ceramic materials have been investigated for use in harsh industrial environments. The materials of interest comprise a wide range of ceramics including conventional oxide ceramics such as alumina and zirconia to more specialized compositions such as boride, carbide, and nitride materials. The materials of interest can be monolithic, single phase ceramics, porous materials, multi-phase particulate ceramics or composites. This symposium will provide advanced analytical and computational tools to establish constitutive models for complex loading conditions, in-situ studies and non-destructive testing, and newly alternative approaches for characterization of the advanced ceramics and composites.</p> <p>Targeted Topics</p> <ul style="list-style-type: none">• Advanced characterization methods at multiple length scales• Electron microscopy and high resolution imaging		

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- Emerging characterization tools for ceramics and composites
- Spectroscopic methods
- X-ray, neutron, synchrotron and electron diffraction
- Thermodynamic and kinetic studies
- Mechanical testings at ambient or high temperatures
- Joining of ceramic and composite parts
- Ab-initio calculations and other predictive tools
- Multiscale simulations and models