

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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THE AUSTRIAN SOCIETY FOR
METALLURGY AND MATERIALS

FEMS 30
FEDERATION OF EUROPEAN
MATERIALS SOCIETIES 1987 - 2017
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Area D: Characterization and Modelling

Symposium D5: Micro- and Nano-mechanics – Characterization and Modelling

Title		
Organizer	Institution	Contact email
André Clausner	Fraunhofer IKTS Dresden	andre.clausner@ikts.fraunhofer.de
Verena Maier-Kiener	Montanuniversität Leoben	Verena.maier-kiener@unileoben.ac.at
Jon Molina	IMDEA Materials, Madrid	Jon.molina@imdea.org

Abstract

Small-scale mechanical testing has become a mature and well-established field of research. Nevertheless, the methodologies themselves and the materials under study continuously evolve due to exciting new possibilities in instrumentation and high-performance computing. Specifically, combinations of advanced small-scale mechanical testing, high-resolution 3D imaging, cutting edge in-situ and operando techniques, high performance computing, data-driven mechanics, advanced multi-scale modelling, and artificial intelligence (AI) algorithms allow exciting new insights into the deformation behaviour of materials. This symposium aims at bringing together these fast-growing research communities to support interdisciplinary approaches in micro- and nanomechanics with the objective of gaining insights into small-scale behaviour of materials including hierarchical as well as functional materials and structures.

Targeted topics of the symposium are:

- Mechanical testing at micro- and nano-scales in terms of nanoindentation, μ -bending, μ -pillar compression, and others
- Computational, data-driven, as well as AI-supported micro- and nanomechanics
- Modelling techniques for small-/multi-scale mechanics including experimental techniques for validation of these models
- Mechanics of nanomaterials and nanostructures, thin films, multiphase materials, as well as hierarchical and functional materials across the length scales
- Strain-rate, fatigue, as well as creep phenomena bridging length scales
- Micro- and nanomechanics of adhesive and cohesive failures
- High-resolution 3D characterization of small structures in relation to mechanical phenomena
- In-situ and operando micro- and nanomechanical testing
- Advanced instrumentation for mechanical testing at micro- and nano-scales