

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 D1:

Title: Advanced Microscopy in Materials Research		
Organizer	Institution	Contact email
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Abstract		
<p>Microscopy directly probes the structure of materials and has accelerated their development from lab-scale to the manufacturing level, so contributing to scientific progress, technological developments, and societal welfare for many decades. Advances in light, X-ray, electron and scanning probe microscopies facilitate the determination of materials structures and structure-property relationships down to the (sub)-nanometre scale. Recent developments include the use of diffractive imaging methods; three dimensional, rather than solely two-dimensional imaging and analysis, empowered by the development of highly sensitive detectors and cameras, automated data collection and data processing methods. Other major methodological advances allow us to achieve such high spatial resolutions while keeping an environment relevant for characterization. This is the case for recent advances when analysing the structure of molecules, macromolecular and soft material systems, where a relevant biological context needs to be preserved, e.g. by using cryogenic methods for sample preservation and correlative microscopy approaches whilst considering electron beam effects during observation. Another example is the increasing use of microscopies for the study of multiphase systems using in-situ and operando methods, as well as time-resolved dynamic microscopies. Indeed, the nanoscale mechanisms of structural and chemical transformations of materials can be studied by keeping their functional state (using in situ and operando platforms and detectors for gas/liquid microscopy and high pressure/temperature observations). This symposium invites contributions focusing on, but not limited to, all the aforementioned techniques and their variants, and on their application to the investigation of the synthesis, processing and functionality of advanced materials, both crystalline and amorphous, both hard and soft, in a wide-range of technologies. Methods and instrumentation for increased spatial, temporal and energy resolution, solutions for data storage and data analysis, as well as improvements in microanalysis for higher accuracy and lower</p>		

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concentration detection are also welcome. Finally, discussion of advanced sample preparation techniques is of interest for this symposium.

Topics to be covered by the symposium:

- High spatial resolution microscopy and diffraction in two and three dimensions
- Micro- and Nano-chemical spectroscopy
- Surface Microscopy and Spectroscopy
- In-situ, Operando and Dynamic Microscopy
- Soft Matter Microscopy