

Symposium: Advanced microstructure characterization using SEM-based techniques

All crystalline materials (metals, intermetallics, semiconductors, ceramics and geomaterials) owe an important part of their properties to their microstructure. Traditionally the term “microstructure” comprised mainly the grain structure, indicated by the size and shape of grains and the distribution of phases. A more modern and comprehensive definition is, however, the number and distribution of all extended crystal lattice defects, like phase distribution, arrangement of grain and phase boundaries, density and arrangement of dislocations and residual stresses.

The scanning electron microscope with all its advanced analysis techniques, in particular modern EDS, 2D and 3D EBSD, ECCI, and variations of SE imaging, allows comprehensive and quantitative microstructure analysis, with a spatial resolution of 10 to 100 nm (depending on the technique). SEM can handle potentially very large samples, which makes the collected data statistically highly reliable, and allow the bridging from microscopic structures to macroscopic properties.

We invite oral and poster contributions, which deal with all aspects of SEM-based microstructure analysis of engineering or natural materials. Of particular interest are contributions, which aim at understanding and interpretation of macroscopic properties, like strength, ductility, fatigue, creep, or processes, like solidification, solid state phase transformation, recrystallization and deformation. A particularly interesting class of materials are those created by additive manufacturing (AM) techniques.