

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 B: Structural Materials

Symposium B5:

Title: High Entropy Alloys		
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Abstract		
<p>This symposium will provide a venue for presentations of research progress on the experimental discoveries and theoretical modeling of high-entropy alloys (HEAs) and related compositional complex alloys (CCAs), covering alloy design, processing, microstructures, and structural and functional properties. Presentations dedicated to other types of high-entropy materials, for example, high-entropy ceramics, are also welcomed.</p> <p>In contrast to conventional alloys, which are mainly based upon one principal element, HEAs have multi-principal elements, often four or more. The significantly high mixing entropy of the solid solution could stabilize the solid-solution phases in face-centered-cubic (FCC), body-centered-cubic (BCC), and hexagonal close-packed (HCP) structures against intermetallic compounds. Moreover, carefully designed HEAs possess tailorable properties that compete and, in some cases, surpass conventional alloys. Depending on alloy systems, such properties include strength, ductility, corrosion and oxidation resistance, fatigue and wear resistance, and functionality like superconductivity, thermoelectricity and catalysis. These properties will undoubtedly make these new materials of interest for use in various structural and functional applications. Given the novel and exciting nature of HEAs/CCAs, the research area is expecting a rapid growth.</p> <p>Topics to be covered include:</p> <ul style="list-style-type: none">• Material fabrication and processing, such as casting, powder metallurgy including additive manufacturing, and thermomechanical treatments• Advanced characterization, such as synchrotron and neutron scattering, three-dimensional (3D) atom probe tomography and high-resolution TEM• Mechanical behavior, such as fracture, fatigue, creep, and micro/nano-mechanics• Functionality, such as magnetic, electric, thermal, catalytic and biomedical behavior• Corrosion and oxidation behavior		

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- Coating and surface treatment
- Theoretical modeling and simulation using density functional theory, molecular dynamics, Monte Carlo simulations, phase-field and finite-elements method, and CALPHAD modeling
- Industrial applications