

FEMS EUROMAT23

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FEMS EUROMAT is the most important international congress in materials science and technology in Europe. It continues a successful congress series promoting the transfer of knowledge and the exchange of experience between academia and industry. **Submission deadline: 31 January 2023**

Area B: Structural Materials

B05: High Entropy Alloys

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.

In contrast to conventional alloys, which are mainly based upon one principal element, HEAs/CCAs have multi-principal elements, often four or more. The significantly high mixing entropy 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/CCAs 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 functionalities 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 seeing rapid growth.

Topics to be covered in this symposium include but are not limited to:

- Material fabrication and processing, such as casting, powder metallurgy, additive manufacturing, severe plastic deformation, 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
- Wear and tribological behavior
- Hydrogen storage and hydrogen embrittlement
- Coatings and surface treatment
- Combinatorial alloy design and high throughput screening
- Theoretical modeling and simulation using density functional theory, molecular dynamics, Monte Carlo simulations, phase-field, and finite-elements method, and CALPHAD modeling
- Machine learning and artificial intelligence applied to the discovery of novel HEAs/CCAs
- 1D and 2D high-entropy materials, including for example, high-entropy nanoparticles and high-entropy MXenes
- Industrial applications

Symposium Organizer



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