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TMS 2025

154th Annual Meeting & Exhibition

March 23–27, 2025
MGM Grand Las Vegas
Hotel & Casino
Las Vegas, Nevada, USA
#TMSAnnualMeeting

SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2025 SYMPOSIUM:

MECHANICS OF MATERIALS

Advances in Multi-Principal Element Alloys IV: Mechanical Behavior

This symposium provides a platform for researchers, scientists, and engineers to present their newest theoretical and applied research findings on multiple topics pertaining to the mechanical behavior of multi-principal element alloys (MPEAs) or high-entropy alloys (HEAs). BACKGROUND AND RATIONALE: MPEAs and HEAs consist of five or more primary elements and are composed of body-center-cubic (BCC), face-centered-cubic (FCC), and hexagonal-close-packed (HCP) solid-solution phases. These alloys can exhibit desirable properties including high strength and ductility, excellent corrosion and irradiation resistance, and high fatigue/wear resistance. Such desirable characteristics make MPEAs/HEAs potential candidates for several applications including those in the aerospace, automotive, biomedical, and energy industries.

Topics of interest include, but are not limited to:

- Multiscale approaches to investigate fatigue and fracture in structural materials
- Advanced in situ and high throughput characterization methods, including transmission electron microscopy, neutron scattering, X-ray diffraction, three-dimensional (3D) atom probe tomography, and electron backscatter diffraction
- Innovative techniques to examine creep, hardness, fatigue, wear, and serrated plastic flow
- State-of-the-art simulation and computational modeling techniques, such as phase-field modeling, molecular dynamics, CALculation of PHAse Diagrams modeling, Monte Carlo methods, finite-element techniques, density functional theory, integrated computational materials engineering (ICME), and machine learning methods
- Microstructural control, including hierarchical structuring, which modifies the physical and mechanical behavior
- Applications of material properties in the aerospace, automotive, biomedical, and energy industries

ORGANIZERS

Peter Liaw, University of Tennessee**; Michael Gao,** National Energy Technology Laboratory**; Jennifer Carter,** Case Western Reserve University**; E-Wen Huang,** National Yang Ming Chiao Tung University**; T.S. Srivatsan,** University of Akron**; Xie Xie,** FCA US LLC**; Jamieson Brechtl,** Oak Ridge National Laboratory**; Gongyao Wang,** Globus Medical

SYMPOSIUM SPONSORS

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