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**TMS2024**  
153<sup>rd</sup> Annual Meeting & Exhibition

MARCH 3–7, 2024  
HYATT REGENCY ORLANDO  
ORLANDO, FLORIDA, USA  
#TMSAnnualMeeting



**SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2024 SYMPOSIUM:**

**DATA-DRIVEN AND COMPUTATIONAL MATERIALS DESIGN**

**Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion**

Local ordering, either chemically or structurally, has received increasing attention in the past few years. In bulk metallic glasses, the short- /medium-range order (SRO/MRO) plays a critical role in the deformation process, such as the formation of shear-band. In simple solid-solution alloys such as Ni-Cr, the degree of SRO has recently been shown to impact the percolation limit in a corrosion process. In multi-principal element alloys such as high entropy alloys, the chemically SRO could affect the work hardening and radiation resistance.

The emergent concept of local ordering presents a new dimension for further tuning the behaviors in structural materials, including mechanical performance, radiation tolerance, and corrosion resistance. However, a fundamental and predictive understanding of the thermodynamics, kinetics and structure-property relationship is lacking due to local atomic-level disordered features.

This symposium focuses on computational and experimental efforts, which promote the development of concepts and methodologies to understand local ordering in materials.

Specific topics include:

- Understanding structural and chemical SRO/MRO in amorphous materials and crystalline alloys via advanced experimental characterization, simulation, and modeling
- The role of SRO/MRO on defect and microstructure evolution at atomistic to microscopic length-scales
- Non-equilibrium dynamics and kinetics under extreme driving conditions, including high strain rate, high/ cryogenic temperature, radiation, and corrosion
- Experimental characterizations and in-situ techniques, including S/TEM, 4D STEM, SEM, in situ TEM, X-Ray,
- Simulation and modeling algorithms, including first-principles methods, atomistic simulation, kinetic Monte Carlo, machine learning

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