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**TMS 2023**  
152<sup>nd</sup> Annual Meeting & Exhibition

MARCH 19–23, 2023  
SAN DIEGO CONVENTION CENTER &  
HILTON SAN DIEGO BAYFRONT  
SAN DIEGO, CALIFORNIA, USA  
#TMSANNUALMEETING



**SUBMIT AN ABSTRACT BY JULY 1 FOR THE FOLLOWING TMS2023 SYMPOSIUM:**

## CORROSION

### 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 the 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

#### ORGANIZERS

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**QUESTIONS?**  
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