

**LOCATION :**

**Thunder Bay Grille  
N14W24130 Tower  
Place  
Pewaukee, WI 53072**

**TUESDAY, OCTOBER 10 2023****TIME**

**5:30 - SOCIAL  
6:00 - DINNER  
7:00 - PROGRAM**

**COST**

**\$ 30 - MEMBER  
\$ 35 - NONMEMBER  
\$ 15 - LIFE MEMBER  
FREE - STUDENT/MEMBER  
BETWEEN JOBS\***

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**ABSTRACT**

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**In situ Study of Microstructural Changes and Strain Localization in Multi-Phase Alloys**

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Deformation-induced microstructural changes and strain localization significantly influence the mechanical properties of multi-phase alloys. Various in situ deformation studies have been actively conducted to understand the deformation micromechanisms affecting these materials. In situ scanning electron microscopy (SEM) provides insights into strain localization processes as well as the evolution of deformation-induced local microstructures. In situ synchrotron high energy X-ray diffraction (HEXRD) offers quantitative information on deformation-induced global phase, (lattice) stress, and texture evolution. This presentation will introduce the recent developments and applications of these two in situ experimental techniques. In particular, current challenges and proposals to tackle these challenges will be discussed with examples from multiphase steels. These new proposals aim to deepen our understanding of the deformation and transformation micromechanisms in multi-phase alloys, offering guidelines for optimizing microstructure design to achieve desired properties.

**PRESENTERS:**

**Hyunseok Oh**  
**UW-Madison**



Dr. Oh is an Assistant Professor in the Department of Materials Science and Engineering at the University of Wisconsin-Madison (UW). Prior to joining UW, he served as a Postdoctoral Associate in the Department of Materials Science and Engineering at the Massachusetts Institute of Technology. He earned both his B.Sc. and Ph.D. degrees from Seoul National University in South Korea.

During his Ph.D. studies, he was also a visiting student in the Microstructure Physics and Alloy Design Department at the Max-Planck-Institut für Eisenforschung in Germany. His research focuses on understanding and utilizing the fundamental process-structure-property correlations in metals. He places particular emphasis on exploring atomic- and micro-scale behaviors using advanced in situ characterization techniques to guide the design of advanced engineering alloys. Dr. Oh was recently honored with the DOE Early Career Research Award in 2023.