

## MATERIALS ENGINEERING

### SEMINAR

#### “Creep Deformation Mechanisms in Co-(Ni)-Al-W based Superalloys with L<sub>12</sub> Intermetallics Precipitates”

By

Ke Xu

Purdue MSE Preliminary Exam

Advisor: Professor Xinghang Zhang

#### ABSTRACT

The creep deformation behaviors of superalloys are intrinsically dominated by the shearing of L<sub>12</sub> ordered gamma prime ( $\gamma'$ ) intermetallics via multiple dislocation pathways. Thermomechanical loading generates various planar defects, such as superlattice stacking faults, antiphase boundaries and microtwins. The initiation and propagation of these defects are generally concurrent with microscopic phase transformation and elemental segregation. This presentation elaborates the current understanding on creep mechanisms inside  $\gamma'$  precipitates in Co-(Ni)-Al-W based superalloys. The segregation assisted processes, such as the effect of segregation on kinetics of planar and linear defects, will also be discussed. Future efforts necessary to link microscopic deformation induced defects and the macroscopic mechanical properties are outlined.

**Date: Tuesday, October 4, 2022**

**Time: 9:00am**

**Place: ARMS 3115 or**

**via WebEx <https://purdue.webex.com/purdue/j.php?MTID=mdbc15537d532673e0b8cce0b500b5d1d>**



School of Materials Engineering