SUBMIT AN ABSTRACT BY JULY 1

FEBRUARY 27-MARCH 3, 2022
ANAHEIM CONVENTION CENTER & ANAHEIM MARRIOTT
ANAHEIM, CALIFORNIA, USA
#TMSAnnualMeeting

SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2022 SYMPOSIUM:

MECHANICS & STRUCTURAL RELIABILITY

Deformation and Damage Mechanisms of High Temperature Alloys

High temperature alloys, notably Ni-, Co-, and Fe-based superalloys are enabling materials for the design of high-temperature components for aerospace propulsion, chemical processing, oil and gas applications, and power generation. They retain superior strength at elevated temperatures, and show excellent damage tolerance, toughness, long-term stability, and resistance to creep accumulation and environmental damage. The performance of these alloys is often improved when formed to optimize microstructure or used in conjunction with surface treatments and coatings or with novel design solutions.

The aim of the symposium is to discuss the mechanisms of deformation and damage in the manufacture, application, and refurbishment of high temperature alloys, principally Ni, Co, and Fe based superalloys but also high entropy or multi-principal element alloys and refractory alloys. It is proposed that the technical focus is on understanding:

- Roles of deformation and heat treatment on the evolution of microstructure during material processing
- Effects of deformation from manufacture on material and component behavior
- Mechanisms of deformation that determine material behavior
- Development of deformation that gives rise to damage during material application
- Effects of composition and microstructure on resistance to deformation and damage accumulation
- Refurbishment, rejuvenation, and life extension processes

Topics of interest may include (but are not limited to):

- Elevated temperature forging, recrystallization, grain growth, flow forming, machining, and shot peening
- Advanced solidification techniques and impact on properties
- Experimental observation of deformation and damage accumulation
- Constitutive and computational modeling of deformation
- Mechanisms of ambient and elevated temperature plasticity, creep, fatigue (LCF, HCF, VHCF), creep-fatigue, crack growth, and environmental damage

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