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 148th Annual Meeting & Exhibition

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March 10–14, 2019
 San Antonio, Texas, USA

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MECHANICS AND STRUCTURAL RELIABILITY

Deformation and Damage Behavior of High-Temperature Alloys

High-temperature alloys are critical to the design and operation of a wide variety of industrially important systems including those for propulsion, power generation, petro-chemical processing and more. To improve the performance and efficiency of these systems, operating temperatures, stresses and environmental conditions are becoming more extreme and many of the key structural materials are now being used near the limit of their temperature capability. As a result, understanding the characteristic deformation behavior of these high temperature structural materials during service is important for component life prediction and the development of new alloy systems. In addition, the characteristic deformation behavior of these materials also impacts their processability and formability (or manufacturability). For example, mitigation of thermally induced stresses during additive manufacturing/welding or optimization of thermal-mechanical processing parameters for forming operations also requires knowledge of the characteristic deformation behavior associated with high temperature alloys. Advances in this field are key to the high temperature structural materials community as they serve to drive research and development on an industrially relevant and scientifically challenging topic.

The symposium aims to highlight recent advances in understanding, quantifying and/or modeling deformation in various high-temperature metallic alloy systems (Ni, Co, Fe and CCA/HEA based alloys). Focus areas of this symposium include, but are not limited to, the development of new alloys, characterization/testing techniques, ICME studies, property models and methodologies, etc. related to deformation, long-term stability, and damage mechanisms in high-temperature alloy systems.

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