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TMS2025
154th Annual Meeting & Exhibition



March 23–27, 2025
MGM Grand Las Vegas
Hotel & Casino
Las Vegas, Nevada, USA
#TMSAnnualMeeting



SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2025 SYMPOSIUM:

ADDITIVE MANUFACTURING

Additive Manufacturing: Microstructural and Mechanical Long-term Stability of AM Materials

Additive Manufacturing (AM) techniques have been increasingly seen as a transformative and emerging alternative to traditional manufacturing techniques, with their potential to realize cost and materials savings through precise near-net shaping of complex geometries and tailored alloying for demanding applications. AM techniques encompass a wide array of technologies, with inherent differences in their processing variables, resulting in unique as-built structural and compositional heterogeneities. Demanding environments for structural alloys such as power generation systems are expected to result in a variety of degradation mechanisms that are likely to impact long term performance, such as precipitation reactions, phase decompositions, and creep damage accumulation. Implementation of any AM technique for manufacturing components intended for long-term service critically necessitates knowledge and understanding of their underlying structure-property relationships. This symposium invites submissions that consider the interplay between native heterogeneity of AM material composition, their processing and thermal history, process-induced precipitates/phase transformations on the changes in microstructural and mechanical properties after long-term thermal aging and creep exposure.

This symposium would like to invite contribution on topics including, but not limited to:

- Characterization of microstructural evolution across various length using electron microscopy, X-ray diffraction and other advanced techniques
- Microstructure-mechanical property relationships of AM materials with an emphasis on micro- and nanoscale behavior, including in-situ local nano-mechanical testing
- Thermally and deformation-induced phase transformation, degradation and instabilities, as a response to aging and/or creep exposures
- Combinatorial approaches of experiments and modeling that consider effects from dispersion strengthening, precipitation, thermal history, and residual stresses on creep

ORGANIZERS

Benjamin Adam, Oregon State University; **Jonah Klemm-Toole**, Colorado School of Mines; **Sneha Prabha Narra**, Carnegie Mellon University; **John Carpenter**, Los Alamos National Laboratory; **Eric Payton**, University of Cincinnati; **Emma White**, DECHEMA Forschungsinstitut; **Sudarsanam Babu**, University of Tennessee, Knoxville; **Markus Chmielus**, University of Pittsburgh

SYMPOSIUM SPONSORS

TMS Materials Processing & Manufacturing Division, TMS Structural Materials Division, TMS Additive Manufacturing Committee

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QUESTIONS?

Contact programming@tms.org