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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:

DATA-DRIVEN AND COMPUTATIONAL MATERIALS DESIGN

Materials Aging and Compatibility: Experimental and Computational Approaches to Enable Lifetime Predictions

The interplay between a material's fundamental aging behavior and its compatibility within a system can have significant impact on highly complex and expensive technologies found in fields such as: aerospace, satellite and space exploration, nuclear weapon programs, etc. However, the understanding of a material's behavior over its entire service life and that material's compatibility within its system during that time is limited and difficult to predict. Emerging advanced manufacturing industries add to the aging and compatibility knowledge gaps by introducing completely new materials or fabricating legacy materials with techniques that allow for new design capabilities causing them to age differently than their wrought counterpart (additively manufactured (AM) metals vs. wrought counterparts). Therefore, it is highly desirable to explore and discuss materials aging and compatibility by establishing their scientific basis and developing modeling/predictive tools.

This symposium provides an excellent platform for scientists, researchers, and engineers to present and discuss recent research advances on experimental and computational modeling on fundamental materials behaviors and their compatibility under real and accelerated environments.

Topics of interest for abstract submission include (but not limited to):
- Scientifically informed accelerated aging methodologies.
- Experimental, computational, and analytical evaluation of materials degradation during accelerated aging environments with individual or some combination of stressors such as mechanical, corrosive, thermal, etc.
- Compatibility studies for materials joining: brazing, welding and soldering.
- Long life system compatibility of two or more different materials.
- Discussion of simulated and experimental data similitude as a method to predict lifetimes.
- Machine learning approaches to predict material/component lifetime.

ORGANIZERS
Bishnu Khanal, Sandia National Laboratories; **Michael Melia,** Sandia National Laboratories; **Coby L. Davis,** Sandia National Laboratories; **Kerri Blobaum,** Lawrence Livermore National Laboratory; **Anthony Van Buuren,** Lawrence Livermore National Laboratory; **Nan Butler,** Sandia National Laboratories

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