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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

High Performance Steels

Steels have been and continue to be of fundamental importance for virtually all aspects of industry and manufacturing in our modern society. This technological importance motivates collaborative and multidisciplinary research between industry, academia, and national laboratories to continuously grow the fundamental understanding of steel behavior. While developing steels with better properties and performance to meet increasing engineering requirements, advancing sustainability of steel production, manufacturing and applications needs to remain a priority. The High-Performance Steels Symposium focuses on novel developments in steel design and new insights into processing-microstructure-property relationships.

Improved understanding of these relationships calls for the following approaches, including, but not limited to:

- Conventional static and dynamic mechanical tests (tensile, compression, hardness, Charpy, bending, etc.) as well as failure testing (fracture, fatigue)
- Advanced characterization techniques (HRTEM, APT, and ex/in-situ SEM/TEM/Synchrotron/neutron diffraction)
- Computational modeling efforts including physics-based or advanced data-science approaches such as ab-initio modeling, computational thermodynamics, discrete dislocation dynamics, crystal plasticity and Machine Learning (ML) methods, in the spirit of integrated computational materials engineering (ICME)
- Design of novel steel microstructures through computational or high-throughput experimental approaches, and their validation

This symposium welcomes contributions in all of these directions and especially those that provide combinatorial approaches, providing a forum to discuss the future of high-performance and sustainable steel design.

ORGANIZERS

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SYMPOSIUM SPONSORS

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