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TMS 2025
154th Annual Meeting & Exhibition



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MGM Grand Las Vegas
Hotel & Casino
Las Vegas, Nevada, USA
#TMSAnnualMeeting



SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2025 SYMPOSIUM:

ELECTRONIC, MAGNETIC, AND ENERGY MATERIALS

Materials for Sustainable Hydrogen Energy

Driven by the high potential of hydrogen technologies to support the transition to sustainable green energy industries, material development across the hydrogen supply chain, e.g. hydrogen generation infrastructure, hydrogen storage, hydrogen transportation, has gained great attention in the last decade. This symposium addresses the recent progress of fundamental research of future materials and the current-in-use materials for hydrogen applications. Topics on hydrogen uptake, diffusion, and trapping, hydrogen effect on material integrity, i.e. hydrogen embrittlement, surface reactions, hydrogen induced defect formation and phase transformations, as well as the development of novel advanced hydrogen-tolerant metallic materials using multi-scale and multi-spatial experimental and simulation approaches are very much welcome. This symposium aims to bring together interdisciplinary engineers and researchers who are dedicated to advancing the fundamental and applied research on hydrogen effects in metallic materials, and serve them a platform for sharing knowledge, discussing cutting-edge methodology and exchanging research experience.

Exemplary topics at the symposium include but are not limited to:

- Novel materials and processes for hydrogen energy, e.g. infrastructure, production, storage, transportation, combustion, etc.
- Characterization of hydrogen - materials interaction, hydrogen diffusion and trapping, using both advanced experimental characterization technology/methods and simulations from atomic to the structural scale
- Impact of environmental conditions on the hydrogen embrittlement sensitivity and on mechanical properties degradation of metallic materials
- Fundamental research by numerical modelling of hydrogen diffusion and fracture to predict hydrogen induced failures and analyze the influence of process parameters on hydrogen embrittlement
- Development of next generation hydrogen-mobility and hydrogen-safety metallic materials
- Design of hydrogen-tolerant metallic materials by artificial intelligence-aided approaches

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SYMPOSIUM SPONSORS

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