THE WORLD COMES HERE.
TMS 2024
153rd Annual Meeting & Exhibition
MARCH 3–7, 2024
HYATT REGENCY ORLANDO
ORLANDO, FLORIDA, USA
#TMSAnnualMeeting

SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2024 SYMPOSIUM:

ADDITIVE MANUFACTURING

Additive Manufacturing: Materials Design and Alloy Development VI – Closed-Loop Alloy Design

While additive manufacturing (AM) offers a new paradigm in part design for complex architectures, the availability of additive-capable existing or new materials is minimal. The need for materials and alloys designed specifically for additive technology is increasing rapidly, and many new approaches have been developed to address this need. Conventional alloys are designed based on constraints of conventional materials processing and manufacturing technologies such as casting, forging, and hot rolling, or sheet metal forming. The unique solidification conditions during these processes have made expanding current conventional alloys to AM difficult and made the introduction of newly designed materials a technology challenge.

A long-time goal in the alloy development community is the creation of a truly closed-loop experimental design system, where properties are optimized by autonomously tweaking composition and processing conditions, all without the need for human intervention. A lot of work towards this vision has been focused on autonomous simulations and machine learning models, data workflows, and decision-making AI algorithms. However, arguably the biggest remaining challenge is a robust, autonomous materials synthesis and characterization platform.

AM is uniquely suited to serve this purpose as it allows for rapid prototyping of unique combinations of compositions, process parameters, and component shapes, all without the need for human input or manipulation. Integrating materials, design, and manufacturing innovation is a new frontier that requires critical attention to harness the full potential of AM technology. In this symposium, we are welcoming work that shows progress in the automation of AM prototyping and subsequent characterization and the integration of AM in closed-loop alloy design workflows.

ORGANIZERS

Behrang Poorganji, University of Toledo, USA
James Saal, Citrine Informatics, USA
Hunter Martin, HRL Laboratories LLC, USA
Orlando Rios, University of Tennessee, USA
Atieh Moridi, Cornell University, USA
Jiadong Gong, Questek Innovations LLC, USA
S. Mohadeseh Taheri-Mousavi, Carnegie Mellon University, USA

SYMPOSIUM SPONSORS

TMS Materials Processing & Manufacturing Division
TMS Additive Manufacturing Committee

QUESTIONS?
Contact programming@tms.org