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# TMS 2023

## 152nd Annual Meeting & Exhibition

**MARCH 19—23, 2023**
SAN DIEGO CONVENTION CENTER &
HILTON SAN DIEGO BAYFRONT
SAN DIEGO, CALIFORNIA, USA
#TMSANNUALMEETING

## SUBMIT AN ABSTRACT BY JULY 1 FOR THE FOLLOWING TMS2023 SYMPOSIUM:

### ADDITIVE TECHNOLOGIES

## Additive Manufacturing: Materials Design and Alloy Development V – Design Fundamentals

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 new designed materials a technology challenge. What is more, the intrinsic properties of AM (i.e., rapid solidification, melt pool dynamic, cyclic heat treatment) can be exploited to design novel materials. Integrating materials, design, and manufacturing innovation is a new frontier that requires critical attention to harness the full potential of AM technology.

This symposium is focused on computational and experimental approaches which enable a greater understanding of development fundamentals for new additive alloys. Understanding how the composition, structure, and property response surfaces are unique in additive manufacturing will accelerate new alloy development. This symposium will highlight research in novel alloys and application driven material design with a focus on how a fundamental understanding of the thermodynamic and kinetic boundary conditions, as well as using ICME approaches, machine learning, and artificial intelligence can provide new insight into development of new alloy systems for AM. The use of reduced build volumes, small batch alloy runs, welding studies, and compositionally graded materials have begun to shed light on the alloy design envelope in AM and should be highlighted. While important, quality control and defect detection are not in the scope of this symposium and submissions should focus on the inherent material properties possible in a system of interest.

### ORGANIZERS

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### QUESTIONS?
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