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TMS 2018
147th Annual Meeting & Exhibition

MARCH 11 – 15, 2018
PHOENIX, ARIZONA

SUBMIT AN ABSTRACT TO:

MATERIALS DESIGN

BUILDING AN ICME INFRASTRUCTURE: DEVELOPING TOOLS THAT INTEGRATE ACROSS LENGTH AND TIME SCALES TO ACCELERATE MATERIALS DESIGN

This symposium will take a unique approach to highlighting two critical elements of Integrated Computational Materials Engineering (ICME): 1) the evolution and assessment of technology gaps in ICME approaches applied to high-temperature structural materials and 2) the tools and infrastructure developments that have bridged length and time scales and/or integrated computational tools and experimental outputs to accelerate materials design and manufacturing.

The introductory session of the symposium on gap analysis will be an invitation-only session that highlights ICME needs from a historical perspective, the envisioned future areas of focus, and the advancements that are addressing the identified gaps for high-temperature structural materials .

The second set of sessions are open to all speakers that are engaged in the development of ICME tools and infrastructure. Specific topics of interest are:
- Quantitative tools for microstructure evolution that can be used to optimize manufacturing process (e.g. rolling, extrusion) or predict materials properties (i.e. fracture, fatigue, and/or corrosion behavior in service)
- Integration of computational tools with experimental data
- Integration of property prediction tools with component performance tools
- Integration of computational tools and experimental data with uncertainty analysis
- Materials informatics-based approaches for data integration and the concurrent consideration of descriptors
- Validation and verification tools and methods for linking simulations with experiments
- Integration tools and methods for linking processing-structure-property relationships
- Collaboration platforms enabling data and tool sharing

The ability to develop the tools that integrate across the process-structure-property paradigm are essential to continuing the success of ICME in accelerating materials design and manufacturing. Practical developments that are specific to industrial applications in the automotive, aerospace, marine, electronic, and biomedical sectors are strongly encouraged.

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