

**— Call for Papers —**  
A Symposium on  
**Additive Manufacturing Process Improvements for Microstructure and Material Properties**

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*

2017 ASME International Manufacturing Science and Engineering Conference (MSEC)\*

June 4 – June 8, 2017

University of Southern California

### **Technical Focus**

With the promise of the “next industrial revolution,” additive manufacturing (AM) and 3D printing have captured the imagination of many. The capabilities of AM have evolved from rapid prototyping to direct digital manufacturing, which demonstrates significant potential for revolutionary, rapid design-to-product cycles for high-value, complex-shape, and mass-customizing manufactures. However, development and qualification of a process for a new component still follows a time consuming and expensive trial-and-error based optimization and empirical validation. Further, real-time monitoring is challenging, due to both limited in-situ process diagnostics and the lack of real-time response models. As a result, AM parts often demonstrate significant variability in mechanical properties, geometry, and surface finish.

This symposium will focus on the latest developments of additive manufacturing for polymer, metal, and composite materials, **particularly, from the perspective of process improvements for microstructure and material properties**. It will feature research that significantly improves AM technologies through process modeling, measurements and material developments that focus on internal characteristics such as microstructure, material properties, residual stress, the melt pool, etc. The symposium will also highlight novel AM materials and applications. Specific topics of interest for this symposium include, but are not limited to:

- Physics-based modeling of AM processes and part attributes towards an understanding of internal characteristics
- Process metrology for AM such as thermography, melt pool monitoring, etc.
- Relationship between feedstock materials, processes, part microstructures, and properties
- Qualification and certification of AM materials, processes, and parts
- Novel AM materials for improved microstructure and alternative applications

Other AM materials/microstructure-related research not included in the listed topics above is welcome.

**\*\* Note: Physical characteristics of the AM part (e.g.: density, lattice structures, surface finish, accuracy, deformation, and design for functionality) are not part of this call. Please refer Symposium titled “Additive Manufacturing Process Improvements for Part Functionality” for the submissions under that category.**

### **Paper Submission**

Authors are encouraged to submit an abstract and full manuscript for review by **November 3<sup>rd</sup>, 2016** via the conference website. Final revised manuscripts must be submitted by **March 8<sup>th</sup>, 2017**. The copyright transfer form must be filled out and the presenting author must register for the event by April 6<sup>th</sup>, 2017 or the paper will be withdrawn from the conference. Authors may also consult [www.asme.org/divisions/med/call/](http://www.asme.org/divisions/med/call/) for updates. **No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at: [www.asmeconferences.org/msec2016/](http://www.asmeconferences.org/msec2016/).**

### **Additional Symposium Activities**

To highlight advancements in this technical area, symposium organizers will:

- work to attract a high profile international invited speaker (with honorarium offered by MED)
- work to assemble a panel for high-level discussion of additive manufacturing with eminent experts from industry, government laboratory and academia

### **Organizers**

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\* The conference is collocated with NAMRI/SME's 45th North American Manufacturing Research Conference (NAMRC45) and JSME's International Conference on Materials and Processing (ICMP 2017), both of which have a separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.