

— Call for Papers —
A Symposium on
Defects in Metal Additive Manufacturing: Formation, Characterization and Mechanical Evaluation

Sponsored by the ASME Manufacturing Engineering Division's
Additive Manufacturing Technical Committee
2020 ASME International Manufacturing Science and Engineering Conference (MSEC)*
June 22 – 26, 2020
Cincinnati, Ohio
Hosted by the University of Cincinnati, College of Engineering and Applied Science

Technical Focus

Additive manufacturing (AM) has demonstrated itself with a great potential as a mainstream manufacturing technology to fabricate parts with complex geometries from various metals and alloys. Metal AM such as powder-bed fusion (PBF) and direct energy deposition (DED), etc., often produces parts with unique mechanical properties that are not attainable by traditional manufacturing processes. As many fabrication processes, however, defects due to the process and feedstock occur potentially in AM, and many of the defects are unique, because of various causes including lack of fusion, keyhole, and delamination, etc. Such defects often potentially become the damage initiation locations that lead to catastrophic failures, while some of them under certain limitations are not significantly harmful. To better utilize AM in metallic applications, thorough understanding of defect formation mechanisms, precision measurements and analysis of defects, as well as their influence to mechanical properties are the keys to establish robust metal AM process controls. Though, metal AM defects have recently drawn broad attentions from the industry and the research community, there is an increasing need to accelerate in-depth analysis of defects in metal AM in a reliable manner. This symposium will focus on the research advances in the formation, characterization and mechanical evaluation of defects in metal AM. Specific topics of interest include, but are not limited to:

- Fundamentals of defect formation mechanisms in metal AM
- Computational modeling of defect formation and corresponding mechanical behavior
- Characterization and statistical analysis of defect geometries and distributions
- State-of-the-art defect metrology and mechanical evaluation techniques
- Uncertainty of metal AM mechanical properties due to defect populations
- Design, analysis and application of surrogate defects in metal AM
- Process windows for different types of defects in metal AM processes
- Effects of feedstock (powder, wire) variations on defect attributes
- Post-processing effects on evolution of defects

Paper Submission

Authors are encouraged to submit an abstract and full manuscript for review by **November 15, 2019** via the conference website. Final revised manuscripts must be submitted by **March 26, 2020**. The copyright transfer form must be filled out by March 19, 2020 and the presenting author must pre-register by **April 15, 2020** or the paper will be withdrawn from the conference. **No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at <https://event.asme.org/MSEC/>.**

All papers accepted by MSEC2020 can be further submitted to any ASME journals, such as the highly prestigious Journal of Manufacturing Science and Engineering, for consideration of archival publication. In addition, high quality MSEC2020 papers will be automatically channeled to relevant ASME journals for fast-tracked publications.

Additional Symposium Activities

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

- Work to attract a high profile international keynote speaker
- Work to organize a panel involving technical subject experts from national labs, academia, and industry

Organizers:

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* The conference is collocated with NAMRI/SME's 48th North American Manufacturing Research Conference (NAMRC48) and LEM&P (Leading Edge Manufacturing / Materials and Processing) by The Japan Society of Mechanical Engineers (JSME), which will have a separate call-for-papers. Please note that submissions of the same paper to more than one conferences are not permitted.