



## Fatigue and Fracture Mechanics in Additive Manufacturing

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### Message from the Guest Editors

Fatigue strength and crack-propagation resistance are essential material properties for designing, optimizing, and managing the structural integrity of AM components. The major concern in the fatigue-life description of AM materials is the large degree of scatter in fatigue life and fatigue limit under similar loading conditions, mostly due to the presence of many process-induced defects and various kinds of heterogeneity (e.g., microstructure and residual stress). The development of robust and accurate models of damage formation, damage accumulation, and failure in AM materials demands accurate characterization of material's response to combined effects of factors such as loading type, loading rate, and environmental conditions.

Research topics of interest include:

- Structural integrity assessments of AM components;
- Multi-scale, physics-based fatigue modeling;
- Computational fracture mechanics;
- Fatigue and fracture of advanced AM materials;
- Thermal–mechanical fatigue of AM materials;
- Environmentally assisted crack growth;
- Residual stress effects on fatigue and fracture;
- Very high cycle fatigue (VHCF) of AM materials;
- Multiaxial fatigue of AM materials.





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### Message from the Editor-in-Chief

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