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Fatigue Performance and Modeling of Advanced Metal Materials

Guest Editor:

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Message from the Guest Editor

Dear Colleagues,

Metallic materials are crucial in engineering applications to bear complex loads in extreme environments, with fatigue being one of the critical failure modes. While basic material fatigue properties are still being assessed through physical testing in accordance with industrial standards, fatigue performance modeling and simulation are increasingly needed in advanced designs of engineering platforms, e.g., aircrafts, leading to certification by analysis (CbA) to save product development costs and time and expand the application envelopes. To achieve CbA with assured safety and credibility, the multi-scale fatigue process—from microscopic defect and damage evolution to the formation of small cracks and their coalescence and the propagation of dominant cracks, leading to macroscopic component fractures—need to be thoroughly understood.

This Special Issue aims to report experimental, theoretical, and numerical studies that would result in the development of conceptual, mathematical, and computational models for physics-based fatigue life prediction, including uncertainty quantification (UQ) of metallic materials.

Dr. Xijia Wu
Guest Editor

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