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Fatigue Life Calculation Approaches for Metallic Materials

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Message from the Guest Editors

The fatigue life of metallic materials and their components is limited under exposure to repeated mechanical loads. Thus, an understanding of their damage evolution as well as estimation of the related (remaining) fatigue life is of major importance for their technical application in various fields.

In order to achieve the goal of a (remaining) fatigue life calculation, it is necessary to determine and provide comprehensive material information describing the microstructures and associated material mechanisms of metallic materials. In addition to external and internal loads, the material's chemical composition, condition, geometry, and surface topography strongly influence the lifetime of its components or structure.

This Special Issue intends to present a collection of the latest developments in the field from well-known researchers. Areas of interest include the simulation and modeling of fatigue processes and material mechanisms, numerical analysis of fatigue data, comparison of empirical results, and the physical principles related to the development of approaches for the fatigue life calculation of materials exposed to cyclic loads.

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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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