Special Issue

Failure Analysis and Evaluation of Metallic Materials

Message from the Guest Editors

In recent years, research hotspots in the field of steel pipeline integrity assessment have focused on intelligentization, multi-scale collaboration, and adaptability to extreme environments. Key research directions include the following:

- Advanced applications of machine learning and IoT for real-time structural health monitoring and predictive maintenance.
- Investigating hydrogen embrittlement mechanisms and developing hydrogen-resistant alloys for steel pipelines and tanks.
- Optimizing structural designs for pipelines under high-pressure, low-temperature, and corrosive deep-sea conditions.

Specific research topics include, but are not limited to, the following: defect assessment techniques for pipe steels; integrity evaluation methodologies for girth welds; fracture assessment approaches in pipeline engineering; statistical analysis and pattern recognition of failure incidents; novel technologies for detecting steel pipeline defects and stress monitoring; and data-driven innovative pathways for integrity management. We look forward to your submissions.

Guest Editors

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About the Journal

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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