Special Issue

Advances in Material Wear Mechanisms and Modeling

Message from the Guest Editors

Material wear remains a critical challenge across sectors such as manufacturing, mining, agriculture, energy, transportation, and biomedical engineering. Components are expected to perform under extreme conditions—abrasion, impact, cyclic loading, and corrosive environments—the demand for advanced materials and accurate predictive models has never been greater. Tribological contacts account for about 23% of global energy use, with 3% spent on remanufacturing due to wear. In developed economies, wear-related failures cost roughly 3% of GDP. By integrating predictive wear modeling—analytical methods, DEM, FEM, CFD, machine learning—consumers can predict component behavior under real conditions. Such capabilities lead to reduced downtime, improved productivity, fewer replacements, and economic and environmental benefits. This Special Issue aims to present and promote the latest scientific and technological advances in understanding, measuring, modelling, and controlling material wear loss. We seek contributions that explore both the fundamental mechanisms behind different wear processes and the applied strategies for improving durability and performance in real-world environments.

Guest Editors

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Deadline for manuscript submissions

20 March 2026

About the Journal

Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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