Special Issue

Ultra-Precision Machining Technologies and Their Applications

Message from the Guest Editors

Ultra-precision machining technology is a highly precise manufacturing process that aims to achieve microscopic- and even atomic-level control of the workpiece surface. This technology finds application in the precision machining, micromachining, and ultra-micromachining of various materials, including optical components, semiconductor devices, and biomedical instruments. Ultra-precision machining encompasses methods such as grinding, polishing, chemical mechanical polishing, ion beam machining, and laser machining. These techniques allow for precise control over surface topography, dimensions, and surface quality by adjusting machining parameters, tool design, and process flow. Utilizing ultra-precision modeling and simulation facilitates accurate control of the machining process, error compensation, a greater understanding of material science, measurement techniques, on-machine metrology, and advanced functional applications. This Special Issue aims to gather technologies and their applications in ultra-precision machining.

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Deadline for manuscript submissions

20 November 2025

Applied Sciences

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.5

mdpi.com/si/234417

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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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