Special Issue

Optofluidic Devices and Their Applications

Message from the Guest Editor

Optofluidics combines optics and microfluidics to control light and fluids at the micro- and nanoscale, driving innovation in biomedical diagnostics, environmental sensing, and energy harvesting. Lab-on-a-chip devices enable rapid, portable analysis for on-site testing and real-time monitoring of biomarkers and pathogens, while optofluidic sensors detect pollutants in air and water with high sensitivity. In energy, optofluidics enhances solar concentrators and artificial photosynthesis systems, improving light harvesting. Compact, high-resolution microscopy and spectroscopy tools expand access to remote imaging and analysis. Advances in 3D printing improve device fabrication, boosting precision and scalability. Despite its potential, challenges like integration complexity, high manufacturing costs, and durability remain. Ongoing research aims to address these, with promising applications in personalized medicine, environmental monitoring, and sustainable energy. This Special Issue explores recent breakthroughs and future directions in optofluidics.

Guest Editor

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Deadline for manuscript submissions

1 January 2026

Micromachines

an Open Access Journal by MDPI

Impact Factor 3.0
CiteScore 6.0
Indexed in PubMed

mdpi.com/si/223564

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