Special Issue

Photodetectors and Their Applications

Message from the Guest Editor

Photodetectors, with their versatile optical sensitivity, serve as pivotal components in advancing modern technologies, spanning image sensors, biomedical diagnostics, remote sensing, optical communications, human–machine interfaces, and advanced machine vision systems. Recent advances in neuromorphic computing have driven the emergence of photodetector-integrated synaptic devices, including optical synaptic diodes, optical synaptic transistors, and photoelectric memristors, which mimic neural plasticity for energy-efficient artificial intelligence architectures. Concurrently, breakthroughs in novel materials (e.g., organic semiconductors, 2D semiconductors, perovskites, and organic–inorganic hybrids) and nanofabrication techniques have expanded device functionalities while addressing scalability challenges. Particularly, flexible and stretchable photodetectors are revolutionizing wearable electronics and conformal biointerfaces, offering unprecedented compatibility with curvilinear surfaces and dynamic environments.

Guest Editor

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Deadline for manuscript submissions

30 June 2026

Micromachines

an Open Access Journal by MDPI

Impact Factor 3.0
CiteScore 7.1
Indexed in PubMed

mdpi.com/si/239788

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