

## Special Issue

# Advances in Photocatalytic and Photoelectrocatalytic Materials: From Mechanisms to Applications

### Message from the Guest Editors

This Special Issue highlights recent progress in materials design, interfacial engineering, and mechanistic understanding of photocatalytic and photoelectrocatalytic systems for sustainable environmental remediation and solar fuel production. Topics include pollutant removal from water and air, hydrogen generation, and CO<sub>2</sub> conversion into value-added chemicals. Particular emphasis is placed on advanced catalysts, including multinary oxides, chalcogenides, and carbon-based semiconductors, as well as strategies such as co-catalyst integration, plasmonic and graphene modification, defect engineering, homo/heterojunction construction, and structural control (e.g., 2D, porous, and photonic architectures) to enhance light harvesting, charge separation, and mass transport. We welcome original research and review articles covering synthesis, characterization, interface engineering, defect physics, and theoretical insights. Contributions on integrated systems, AI-assisted materials discovery, and durable, low-toxicity catalysts are especially encouraged.

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### Guest Editors

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### Deadline for manuscript submissions

20 December 2026



## Materials

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*Materials* (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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