Special Issue

Light Emitting Diodes: Materials to Applications

Message from the Guest Editor

Light-emitting diodes (LEDs) have reshaped the modern technological landscape, evolving from simple indicators to cornerstone components in advanced lighting, displays, and optical systems. Rooted in advances in wide-bandgap semiconductors such as GaN and AlN, as well as organic emissive materials, both inorganic LEDs and OLEDs have achieved remarkable progress in efficiency, stability, and integration. The continual development of epitaxial growth methods, quantum structure design, and light extraction techniques has enabled LEDs to reach remarkable levels of performance across the visible and ultraviolet spectrum. Furthermore, the emergence of mini/micro/nano-LEDs, perovskite emitters, and flexible optoelectronics opens new frontiers in high-performance display systems, AR/VR, optical communication, and biomedical interfaces. At the intersection of materials science, device physics, and system engineering, the LED field embodies interdisciplinary innovation with a global impact. This Special Issue aims to provide a comprehensive platform for the latest advances spanning the full LED technology spectrum, from fundamental material development to device integration.

Guest Editor

Prof. Dr. Shengjun Zhou

1. Center for Photonics and Semiconductors, School of Power and Mechanical Engineering, Wuhan University, Wuhan 430072, China
2. Wuhan Joint Innovation Laboratory of Advanced Display Industry, Wuhan 430070, China

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Materials
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
materials@mdpi.com

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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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1. Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, QC H3A 2B6, Canada
2. Faculty of Dentistry and Oral Health Sciences, McGill University, 3640 Rue University, Montreal, QC H3A 0C7, Canada

Prof. Dr. Yuguang Ma
State Key Laboratory of Luminescent Materials and Devices, South China University of Technology, Guangzhou 510640, China

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