Special Issue

Sensing in Harsh Environments: Power, Communication and Material Challenges

Message from the Guest Editor

This Special Issue will focus on the key challenges and recent advancements in sensing technologies designed for harsh environments, such as extreme temperatures, high pressures, corrosive conditions, and remote locations. Sensing systems play a vital role in applications like environmental monitoring, space exploration, industrial automation, and defence operations. However, these environments demand innovative solutions in three critical areas: power management, communication, and material resilience. Papers in this issue will explore sustainable power solutions, including energy harvesting techniques like solar, thermal, wireless, and kinetic energy, aimed at enabling long-term sensor operation in isolated regions. Another major focus will be communication technologies, such as low-power wide-area networks (LPWAN), satellite links, IoTs, and mesh networks, which allow reliable data transmission in areas with limited infrastructure. The issue will also examine material innovations, including corrosion-resistant alloys, self-healing polymers, and advanced encapsulation techniques to enhance sensor durability in extreme conditions.

Guest Editor

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Message from the Editor-in-Chief

Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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