

Edinburgh, UK Special Session on Optical and Wireless Sensor Networks for 6G

Organizers

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Scope of the Session

The scope of this session lies mainly within the research areas covered by Optical and WIreless sensors Networks for 6G scenarios (OWIN6G) project. Wireless Sensor Networks (WSNs) have evolved significantly with the integration of optical technologies, giving rise to advanced optical WSNs that require robust management and security strategies to ensure reliable performance. The implementation of digital twins for optical WSNs further enhances system monitoring, predictive maintenance, and virtual testing. Innovations in novel optical sensor devices and components are paving the way for greater sensitivity and miniaturization, while diversity techniques and localization methods improve accuracy and resilience in dynamic environments. Enhanced networking capabilities, supported by hybrid optical/RF wireless systems, offer flexibility and extended range. In addition, energy harvesting technologies are being explored to power sensor nodes sustainably. The design of the PHY/MAC layers, including cross-layer optimization, plays a crucial role in improving system throughput and latency. Various Optical Wireless Communication applications benefit from advanced transceiver design and optimization, which are essential for ensuring efficient data transmission. Furthermore, innovative duplexing and multiple access techniques are being developed to support high-density deployments and simultaneous user access, marking a significant leap forward in the capabilities of next-generation optical WSNs.

Prospective authors are invited to submit original and unpublished work on the following research topics related to this Special Session

- · Wireless sensors networks
- \cdot Digital twin for optical WSN
- \cdot Diversity techniques and Localization
- \cdot Novel optical sensor devices and components
- \cdot Management & security strategies for optical WSN
- \cdot Optical wireless communication applications
- Networking
- · Energy harvesting
- · Hybrid optical/RF wireless systems
- \cdot PHY/MAC design
- \cdot Cross-layer design and optimisation
- \cdot Duplexing and multiple access technique

Submission Link https://eng.ed.ac.uk/csndsp-2026/authors-centre/paper-submission







