



Announcement of an *IEEE/OSA* *Journal of Lightwave Technology Special Issue on:* **Multi-band Optical Networks**

Scope: Currently, deployed optical networks (e.g., for backbone and metro) are reaching the saturation of their capacity given the continuous bandwidth demand increase and the limited spectral efficiency (SE) improvements expected from future generations of optical interfaces. However, the installation of new fiber infrastructure usually requires high investments from network operators. Thus, alternative solutions that allow to cope with the enormous bandwidth demand while attaining the best possible Return-on-Investment (RoI) on the existing legacy fiber infrastructure are needed. Currently, single-mode fibers (SMF) are mainly used in the C-band, where SMFs present the minimum attenuation. The exploitation of other bands (e.g., E, S, L) may be an effective solution for upgrading network capacity while postponing the installation of new fibers. Commercial C+L line systems for L-band upgrades or native C+L installations have been gaining popularity in the market. Exploiting further bands (e.g., S and E) of the optical spectrum is subject of investigation in the community. As an example, the large amount of deployed optical fibers with negligible absorption peak makes transmission possible from L- to O-band with loss below 0.4dB/km.

Importantly, to successfully upgrade network capacity via using additional bands on the existing fiber infrastructure, several critical issues still need to be addressed. Firstly, the enabling switching and amplification technology does not support networking in all the bands yet (e.g., commercial wavelength selective switches operate in C+L bands only). Secondly, wideband propagation impairments such as the Stimulated Raman Scattering (SRS) need to be carefully evaluated to determine the overall impact on quality of transmission in ultra-wideband systems. Thirdly, the expected variation of optical performance across some of the bands may require more elaborate power control strategies and advanced routing and spectrum assignment algorithms. In addition to these, other open issues that should be considered include scalable and cost-effective network and node architecture, network control and automation, programmability of devices operating in multiple bands, processing of monitoring information, and so on. This special issue focuses on multi-band (MB) optical networks, mainly including (but not limited to) the following aspects:

- network components operating in new bands (e.g., filters, switches, amplifiers, transponders)
- optical cross-connect (OXC) or reconfigurable optical add/drop multiplexer (ROADM) architectures for MB switching
- digital signal processing, performance monitoring and processing of monitored information
- physical layer modelling and related implications in networking
- investigations on networks based on hollow-core fibers
- multi-band power control strategies, including the use of AI techniques
- network architecture, design and optimization
- techno-economic analysis of multi-band solutions
- routing, spectrum, and band assignment
- network reliability and survivability
- control plane (e.g., Software Defined Networking) extensions and protocols
- multi-band network slicing
- operation, administration, and maintenance

The upcoming special issue will provide the latest technological development and trends in the direction of MB optical networking, and also hints on the future roadmaps for industrial metro and core MB optical networks.

On behalf of the Guest Editors and the Editor-in-Chief, we encourage you to submit your work for inclusion in this Special Issue by September 30, 2021. Accepted papers will appear in the May/June 2022 hardcopy issue with accepted papers posted online and citable within one week of author final file upload. Mandatory page charges of \$260.00 per page are enforced for Original Contributions in excess of 7 pages and in excess of 10 pages for Invited Papers. Tutorial presenters will be invited to write articles that are up to 16 pages in length. The same mandatory fees apply to each Tutorial paper in excess of 16 pages.

Submissions by website only: <http://mc.manuscriptcentral.com/jlt-ieee>

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