Description of the group

The Optical Networks and Photonic Systems Group is one of the seven research groups within the Nanophotonics Technology Center of the Universitat Politècnica de València. The group is led by Prof. Roberto Llorente and it is focused on the development of novel network architectures, new modulation and multiplexing schemes, the study of novel optical transmission media, and the development of novel photonic devices with advanced functionalities targeting to maximise the network capacity in core, metro and access networks, and also for cellular optical transport, where specific technologies are developed for both backhaul and fronthaul segments. The group addresses top-down architectural work, and also key bottom-up photonic technologies as modal converters or optical beamformers. The group is gender-balanced, being currently formed by female researchers at about 50%.

Optical transmission is the foundation of modern networks for access, metro, core and cellular transport. The interest to increase the network capacity in a cost- and energy-efficient way has increased exponentially recently due to the exceptional sanitary conditions. Transmission technology in the state of the art is targeting higher frequency bands, using larger bandwidths, and is designed considering seamless support of parallelization schemes as MIMO based on digital signal processing. Research in the group targets to enable very high frequency bands employing novel optical up-/down-conversion schemes operating jointly with optical beamformer systems targeting to compensating the increased atmospheric attenuation. Novel comb-based network architectures play a key role in this scenario.

Our current research interest is focused in developing and demonstrating experimentally novel photonic architectures based on reconfigurable, high-frequency, large bandwidth photonic integrated circuits (PIC) implementing beamforming networks assisted by novel optical transmission media [1-5]. The work is expected to be done in the context of R&D projects in collaboration with European partners (Technical University of Eindhoven, University College London, etc.) in the framework of national and international research projects. A short research stay in a foreign laboratory is possible provided availability by the candidate.
Selected recent publications


Contact

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