# Foreword

This year, besides its regular issues, the Journal of Microwaves, Optoelectronics and Electromagnetic Applications is publishing two Special Issues on Optics. That has never happened before and shows how much active the research in this broad area is, nowadays. In this second special issue, the theme is Optical Communication, which accounts for an important part of the Telecommunication extraordinary growth observed in the last 25 years. Particularly, in a Brazilian context, we have been witnessing the maturing of several research groups that have worked for many years in the optical communication area, and a booming of the national industry, that uses many of the technologies developed locally.

In recent years, the Optical Communications have played an increasingly key role for service providers, mainly because they effectively enable the continuous introduction of video, audio and data applications for world-wide usage. Such increase in bandwidth consumption, starting from access networking requirements, spreads the need for disruptive technologies throughout the entire set of networking domains. The research and development of innovative technologies configure a scenario with optical access networks providing 1 Gb/s/user, and backhaul & backbone networks ranging from 100 Gb/s (being implanted) and 400 Gb/s (next generation, approaching the market) to1 Tb/s optical superchannels (next solution).

This Special Issue is illustrative of how researchers in national and international laboratories are committed to the pursuit for providing flexible networking capabilities with emphasis on devices, transmission systems and networks. Out of the twelve selected articles, two are related to devices: a stochastic analysis of the laser spectrum, considering the effects of phase noise generation, and a study of three different techniques for optical superchannel generation. Four articles focus on transmission systems, highlighting: a study on the channel sharing in wireless optical links, a 1.15 Tb/s superchannel transmission through thousands of fiber kilometers; the impact of four wave mixing in the WDM transmission of 112 Gb/s PDM-QPSK signals; and the optimization of an OFDM transmission with direct detection in short range links. In the optical network area, six articles have been selected, covering: the use of neural networks for mapping the noise figure and gain flatness in EDFAs' power masks; the OSNR monitoring by using techniques with a cost-effective DSP; a comparative study of network architectures for next-generation ROADMs; a proposal for a scheme of an "opportunistic burst cloning" to control the overhead burst cloning; an algorithm for spectrum allocation based on first-fit spectrum ordering; and an algorithm for self-configuration and self-healing aiming cognitive optical network applications.

I would like to thank to the numerous authors who have believed in the feasibility of a special issue on optical communications in our journal and submitted their articles, to all reviewers, for their serious and hard work, and, in particular, to the JMOe Editor, Theresa Rocco, for the invitation to organize this edition, and to the JMOe Associate Editor, Monica Rocha, for the support given throughout all these months of preparation of the Special Issue, without which it would have been very difficult to get the obtained final quality.

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Guest Editor of the Special Issue on Optical Communication

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1 CPqD – Optical Communication Group