Special Issue

Advances in Optical Microresonators

Message from the Guest Editors

Optical microresonators are unique tools for photonic engineering and fundamental research. Their main advantage is an achievable ultrahigh-quality factor at small sizes that makes it possible to utilize nonlinear effects even at milliwatt-scale pump power. Currently, microresonators made of a wide variety of transparent dielectrics are used to create filters, modulators, and various sensors in the range from mid-IR to ultraviolet. The development of photonic chip manufacturing technology brought in new insights, allowing a flexible mass production of microresonator-based structures. The most mature one at present is the CMOS-compatible Si3N4 platform on which the Q-factor of ring resonators exceeding 109 was reached, and numerous devices have been demonstrated, including generators of soliton frequency combs for applied and fundamental metrology and even quantum-squeezed light sources. The rich nonlinear dynamics combined with the multimode nature and the possibility of using various materials and topologies provides unlimited opportunities for further research and development in this area.

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Editor-in-Chief

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