

Special Issue

Recent Advances in Silicon Nitride and Silicon-Rich Nitride as a Photonic Platform

Message from the Guest Editors

Silicon nitride has generated significant interest as a Complementary Metal-Oxide-Semiconductor (CMOS)-compatible integrated photonics platform. Although the material is centrosymmetric, second-order nonlinear effects have been observed in silicon nitride waveguides due to symmetry breaking of the bulk material, as well as through more exotic phenomena such as the coherent photogalvanic effect. Furthermore, increasing the silicon concentration of the material modifies the optical properties and produces silicon-rich nitride (SRN). An increasing silicon concentration results in higher refractive index and higher optical nonlinearities, although this comes at the cost of increasing optical losses and TPA. These properties have led to promising proof-of-concept devices for applications including optical switching and modulation, broadband nonlinear wave mixing, comb generation, and coherent supercontinuum generation. However, a number of open questions remain in order to realize the ultimate potential of silicon nitride.

Guest Editors

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Deadline for manuscript submissions

closed (31 October 2024)



Crystals

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Impact Factor 2.4
CiteScore 5.0



mdpi.com/si/203942

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