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Ion beams for photonic integrated circuits

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Ion beam technologies are today routine methods in electronic device manufacturing, e.g. the production of a modern processor needs 20-30 ion implantation steps. On the other hand, the 21st century is considered by many to be the century of light following a century of developments in electronics. Therefore, I will present several experiments for the manipulation of the optical properties of materials, thin films and nanostructures using ion beams, together with corresponding strategies for the realization of photonic integrated circuits. This will include the emission enhancement of erbium in plasmonic waveguides [Nat. Com. 14, 2719 (2023)] as well as the realization of integrated erbium-doped amplifiers [Science 376, 1309 (2022)].

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