High Confinement Silicon Photonics

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Silicon Photonics enables a platform for monolithic integration of optics and microelectronics for applications of optical interconnects where high data streams are required in a small footprint. The tutorial will provide an overview of optical communications and the birth of on-chip photonics. It will then describe the state of art and research challenges of silicon photonic integration with microelectronics for interconnect applications. Silicon is evolving as a versatile photonic platform with multiple functionalities that can be seamlessly integrated. The tool box is rich starting from the ability to guide and amplify multiple wavelength sources at GHz bandwidths, nonlinear photonics to optomechanical MEMS and opto-fluidics devices. The tutorial will describe these new research directions and novel applications.