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## Soft matter for integrated photonics and resonances: Various hybrid approaches and adaptive technologies

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Integrated photonics is increasingly used in sensors and metrology applications. Moreover, the ability to develop new photonic devices through simple, low cost and mass production fabrication steps based on new materials and hybrid approaches is substantial. We will give an overview of targeted current research on integrated photonics based on various hybrid technologies so as to develop multiple families of resonant integrated structures called resonators shaped in 2D or 3D. Such devices devoted to optical resonances and sensors applications and their solving approach highlight the interest to develop specific hybrid processes such as nano-biomolecular film deposition as lipids, self-assembled and micro-fluidic devices, plasma treatments coupled with micro-technology thin layers processes using deep UV lithography and so on.

### Biography

Bruno Bêche is Professor of Physics at the University of Rennes 1 (IPR CNRS 6251). His teaching activity took place in several universities as well as in engineering schools in France, holding lectures in fundamental physics, physics of materials, and also photonics at all student levels of education. His research career started on the development of optical components based on lithium niobate as non-linear optical devices and then he worked in the development of III-V semiconductors as components for the wavelength division, multiplexing and lasers (FEMTO-ST and LAAS CNRS, France and NTT Corporation, Japan). At the University of Rennes 1, he started a new field of research, working since a few years in the development of various micro-resonators based on hybrid technologies which combine the use of polymers and plasma treatments, soft matter with fluidic and biology concepts. His research work covers both the theoretical description of the physical aspects of these photonic devices and also the technologies, the characterization and their applications as integrated biosensors in metrology. He is Honorary Member of the 'Institut Universitaire de France' - IUF Paris.

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