

## **Lithium Niobate Nanophotonics**

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The recent development of integrated photonic crystals within planar waveguides can help implementing compact devices with fully integrable functions. In these devices, light is confined into the crystal by a classical waveguide construction.

Lithium niobate (LN) is a suitable material for 2D photonic crystals because of its high refractive index. Moreover, it is a ferroelectric crystal of great interest to the optics, telecommunications and laser community due to its large electro-optic and non-linear coefficients and extensive applications in piezoelectric, acousto-optic, pyroelectric and photorefractive devices.

However, the realisation of high aspect ratio submicron structure in LN is up to date a challenging problem due to its well known resistivity towards standard machining techniques like wet etching.

In this seminar, I will present the design, fabrication, and optical characterisation of novel infra-red tunable lithium niobate photonic crystal devices. Slow light propagation allows enhancement of the tunability, thus, we have experimentally observed a spectacular increase on the acoustic, electro-optic and pyroelectric properties of the nanodevices.

Author's Bio: Maria-Pilar Bernal received her B.S. and Ph.D. degrees in physics from the University of Zaragoza, Spain, in 1993 and 1998, respectively. From 1994 to 1998, she participated in a joint study between the University of Zaragoza and the IBM Almaden Research Center, where she worked in the field of holographic data storage. Subsequently, she was a research assistant at the Swiss Federal Institute of Technology, Lausanne (Switzerland), where she worked on scanning near-field optical microscopy. She is Directeur de Recherche CNRS at the Institute FEMTO-ST, UMR 6174, Optics Department in Besançon (France) where she develops a research project in nanophotonics and Deputy Director of the Optics Department at FEMTO-ST.