



ANUNCIO DE SEMINARIO

Lugar: Salón de Actos de la ETSI Telecomunicación (3ª planta)

Hora: 12:30

Día: Jueves, 25 de Mayo de 2006

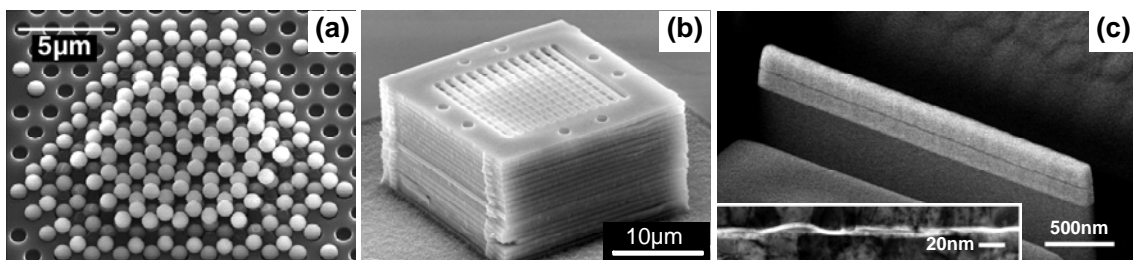
Three-dimensional photonic crystals and plasmon nanocavities

— Manipulation of photons with elaborate micro/nano-structures —

Dr. Hideki T. Miyazaki

Nanophotonics Group, National Institute for Materials Science, Tsukuba, Japan

Photons behave peculiarly when they meet wavelength-sized structures. A photonic crystal is a representative of such micro/nano-structures. Although 2D photonic crystals are extensively investigated by using semiconductor processes, fabrication methods of completely controlled 3D photonic crystals are not yet established. We have developed a mechanical assembly technique of microstructures under the observation of a scanning electron microscope, and have applied it to the fabrication of 3D photonic crystals. Typical assembly procedures will be presented using video. In this talk, our latest result in plasmonics will also be shown. Recently, confinement of light in photonic crystal microcavities has been of growing interest. However, if we use surface plasmons, light can be squeezed into much smaller volume. A nanosheet plasmon cavity, in which light is confined in a dielectric sheet with a thickness of only 3 nm, is introduced.



Figures: (a) Diamond photonic crystal (collaboration with Prof. F. Meseguer, Unidad Asociada CSIC-UPV), (b) woodpile photonic crystal, and (c) nanosheet plasmon cavity (inset: cross section of the 3-nm-thick SiO₂ sheet sandwiched between Au claddings).

[1] H. T. Miyazaki, H. Miyazaki, K. Ohtaka, and T. Sato, *J. Appl. Phys.* **87**, 7152 (2000).

[2] H. T. Miyazaki, H. Miyazaki, N. Shinya, and K. Miyano, *A. Phys. Lett.* **83**, 3662 (2003).

[3] F. Garcia-Santamaria, H. T. Miyazaki, A. Urquia, M. Ibisate, M. Belmonte, N. Shinya, F. Meseguer, and C. Lopez, *Adv. Mater.* **14**, 1144 (2002).

[4] K. Aoki, H. T. Miyazaki, H. Hirayama, K. Inoshita, T. Baba, K. Sakoda, N. Shinya, and Y. Aoyagi, *Nature Mater.* **2**, 117 (2003).

[5] H. T. Miyazaki and Y. Kurokawa, *Phys. Rev. Lett.* **96**, 097401 (2006).