
TWENTIETH

DAVID L. DEXTER LECTURE



**The University of Rochester
The Department of Physics & Astronomy
Wednesday, March 3, 2010
3:45 pm Bausch & Lomb 109
Tea 3:30 in B&L Lobby**

***Sub-wavelength Photonics: From Light Manipulation
to Quantum Levitation at the Nanoscale***

Federico Capasso

Wallace Professor of Applied Physics
Harvard University



Surface Plasmon Polaritons (SPPs) allow one to concentrate light into sub-wavelength regions, thus opening up rich new directions in physical optics and photonics. A wide range of phenomena and applications across a spectral range from the visible to the mid-infrared, made possible by SPPs and by advanced fabrication techniques, will be presented in this talk. At nanoscale distances, forces arising from quantum fluctuations of the electromagnetic field cannot be neglected and give rise to both attractive and *repulsive* Casimir forces. The latter, recently measured by us for the first time, could lead to ultralow friction mechanical devices based on quantum electrodynamic levitation.

Prof. Capasso is the Robert Wallace Professor of Applied Physics at Harvard University, which he joined in 2003 after a 27 years career at Bell Labs where he did research, became a Bell Labs Fellow and held several management positions including Vice President for Physical Research. His research has spanned a broad range of topics in the areas of electronics, photonics, mesoscopic physics, nanotechnology and quantum electrodynamics, and he is a co-inventor of the quantum cascade laser. He is a member of the Nat'l Academy of Sciences, the Nat'l Academy of Engineering, a fellow of the American Academy of Arts and Sciences and an Honorary Member of the Franklin Institute. His awards include the King Faisal Int'l Prize for Science, the APS Schawlow Prize, the IEEE Edison Medal, the OSA Wood Prize, the Materials Research Society Medal, the Rank Prize in Optoelectronics, the IOP Duddell Medal, and the Willis Lamb Medal, among others. He is a Fellow of the OSA, APS, IEEE, SPIE, IOP and AAAS.

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