

ECE DISTINGUISHED SPEAKER SERIES



Federico Capasso
Harvard University

Hosts
Professor Yongmin Liu
Professor Matteo Rinaldi

**New Frontiers in the
Nanotechnology of Light:
From Quantum Cascade
Lasers to Flat Optics**

Tuesday, February 23

440 Egan Research Center
10 am – 11 am

Reception to follow

**Sponsored by the Department
of Electrical and Computer
Engineering**

The convergence of fundamental science and nanotechnology is leading to revolutionary advances in light-based technologies, from the ability to see images with details much smaller than the wavelength of light, such as proteins, to efficient solid-state lighting. The pace of progress in photonics is relentless: I will describe recent research of my group ranging from quantum cascade lasers, which are revolutionizing ultrahigh sensitivity sensing, climate change chemistry and medical diagnostics, to flat optics, a new technology with myriad of future applications such as aberration free lenses, smart skins and augmented reality.

Federico Capasso is the Robert Wallace Professor of Applied Physics at Harvard University, which he joined in 2003 after 27 years at Bell Labs where his career advanced from postdoctoral fellow to Vice President for Physical Research. He has made major contribution to optics, photonics and nanotechnology, pioneering the band-gap engineering technique to design semiconductor nanostructures, including the invention and realization of the quantum cascade laser, and the study of forces due to quantum fluctuations at the nanoscale, such as the first measurement of the repulsive Casimir force.

Recently he has introduced a new approach to photonics devices and optical materials design, known as flat optics, which have led him to the generalization of the laws of refraction and reflection based and to the demonstration of aberration free flat lenses. He is a member of the National Academy of Sciences, the National Academy of Engineering, a fellow of the American Academy of Arts and Sciences and a foreign member of the Accademia dei Lincei. His awards include the IEEE Sarnoff Award, the Materials Research Society Medal, the Franklin Institute Wetherill Medal, the Rank Prize in Optoelectronics, the Optical Society Wood Prize, the IEEE Edison Medal, the American Physical Society Arthur Schawlow Prize in Laser Science, the King Faisal Prize, the Berthold Leibinger Zukunft Prize, the Julius Springer Prize in Applied Physics, the Institute of Physics Duddell Medal, the Jan Czochralski Award for lifetime achievements in Materials Science, the European Physical Society Quantum Electronics Prize, the Rumford prize of the American Academy of Science, the SPIE Gold Medal and the Gold Medal of the President of Italy for meritorious achievement in science. He holds honorary doctorates from Lund University, Diderot University and the Universities of Bologna and Roma II (Tor Vergata).

ECE Distinguished Speaker Series Committee Members:

Matteo Rinaldi (rinaldi@ece.neu.edu)

Marvin Onabajo (monabajo@ece.neu.edu)

Stratis Ioannidis (ioannidis@ece.neu.edu)