



**SAN FRANCISCO BAY AREA  
NANOTECHNOLOGY COUNCIL**

**Wednesday - August 19, 2009 Seminar**

**Co-Sponsored by the SCV Chapter, IEEE Photonics Society**

**Title: Sub-wavelength Dielectric Gratings: A New Handle On Light**

**Speaker: Dr. David Fattal, Staff Researcher HP Labs**

**Date:** Wednesday August 19, 2009

**Time:** Registration & light lunch 11:30am. Presentation & Q/A 12:00 to 1pm

**Location:** National Semiconductor Bldg E-1 CMA Room. 2900 Semiconductor Drive, Santa Clara, CA  
<http://www.google.com/search?hl=en&q=2900+Semiconductor+Drive.+santa+clara+%2C+ca&btnG=Google+Search>

**Cost:** IEEE Members and Students \$5. Non-Members \$10

**Please RSVP at our web site:** [www.ieee.org/nano](http://www.ieee.org/nano)

**Talk Abstract:**

Dielectric gratings exhibiting resonance phenomena have been studied since the early 90's, offering a new paradigm for optical filtering and sensing. More recently, they have been proposed as an interesting alternative to DBR stacks to realize high quality reflectors, for use e.g. in VCSELs. Our team at HP Labs is pushing the resonance grating concept even further. We discovered that a non-periodic resonance grating can offer an unprecedented level of control over an optical beam --- acting like a high reflectivity mirror or a high transmission lens with the ability to alter the phase front of the beam in an arbitrary way.

In this talk, I will review the main physics behind sub-wavelength resonance gratings, and will explain this novel phase front control concept, illustrated by some recent experimental results of a "planar" cylindrical and spherical mirror.

**Speaker Biography:**

Dr. Fattal is a Staff Researcher in the Information and Quantum Science Lab at HP Labs, where he works on nanophotonics for classical and quantum information processing. His present research interests and projects include:

- 1 Solid-state photonic quantum information technologies, in particular using photonic crystals.
- 2 Experimental and theoretical aspects of Cavity quantum electrodynamics (QED).
- 3 Quantum Computation and Communication theory.
- 4 Metallic and dielectric grating theory, with applications to novel optoelectronics devices.

He has published 19 technical articles and is the recipient of the 2001 Carnot Foundation Prize. He holds a Ph.D. from Stanford and a BS in Mathematical Physics from Ecole Polytechnique in France.