

# Colloquium Notice

## Frank Vollmer

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### *High-Q optical resonance in ordered and disordered structures and their applications*

Optical microresonators such as silica spheres exhibit ultra-high quality (Q) factors and small modal volumes which significantly enhance interaction of the optical field with the material. We use this attribute for biosensing, where a single molecule can shift the frequency of a resonant mode. Applications in biology range from label-free analysis of molecular interactions to detection of bacteria and viral particles. Recently, we have also explored a new approach to photon localization in disordered photonic crystal (PhC) structures. We show that the guided modes in line-defect PhC waveguides experience coherent backscattering by superimposed disorder which can lead to Anderson localization. Random optical cavities with Q's  $\sim 3 \times 10^5$  and ultra-small modal volumes were observed and can find applications in optical sensing systems, random nano-lasers and quantum-computing.

Monday

**March 3, 2008**

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326