

# New Directions in Microscopy: Sharper, Deeper, Smarter

**December 14-15, 2009; followed by the Southeast  
Regional Ultrafast Meeting, December 15-16, 2009  
French Family Science Center**

Optical microscopy has been an essential tool in biology and medical practice for centuries. As imaging technologies evolve from monitors of structure to monitors of function, optical microscopies have also evolved dramatically, driven largely by innovations in laser technology. This symposium will focus on new optical imaging methods which can

- improve resolution by an order of magnitude or more past the traditional diffraction limit
- overcome scattering and absorption in tissue to produce high resolution images far deeper in tissue than previously possible
- create entirely new contrast in images, which correlates better with the intrinsic cellular biochemistry (for example, of cancer)

Invited presentations will address multiple new methods in superresolution microscopy, nonlinear imaging (two-photon microscopy, with and without fluorescence signatures), and effects of spatial and polarization shaping on the laser to reduce scattering and improve penetration depth. Both *in vivo* and *in vitro* applications will be presented. The meeting will include laboratory tours of the University shared microscopy facility in French, and various laser laboratories. The Plenary speaker will be Michael Fayer (Stanford); invited speakers include Jerome Mertz (Boston University), David Smith (Duke), Joseph Izatt (Duke), Michael Levene (Yale), Warren Zipfel (Cornell), and Volker Westphal (Gottingen).

**This year, our meeting will dovetail with the Southeast Regional Ultrafast Laser meeting, sponsored by Coherent. CMBI speakers will present on Monday and Tuesday; the Ultrafast meeting will begin Tuesday afternoon and continue on Wednesday, with dinner and an after-dinner speaker on Tuesday night.**