

2009

3rd Annual Dasari Lecture

Changhuei Yang, California Institute of Technology

“Innovations in biophotonics-from \$10 chip-Scale microscopes to time reversal-induced tissue transparency”

Biophotonics is a rapidly evolving research area aimed at providing new light-based imaging, diagnostic and therapeutic tools for biologists and clinicians. Professor Yang will be discussing two areas of biophotonics research currently occurring in his lab:

1) The Optofluidic Microscope

This project fuses the advantages of optical and microfluidic technologies to create small and cheap microscope systems that do not contain any optical elements. The working principle is similar to the way we see floaters in our eyes. This new way of formulating microscopes also allows for remarkably simpler phase and darkfield microscope designs.

2) Tissue Scattering Suppression by Time Reversal Optical Phase Conjugation.

This research project explores an approach for turning biological tissues transparent through the use of holography. Light scattering in tissues may look random but their trajectories are deterministic. As such, it is possible to create a situation where light scattered from a tissue will retrace their paths through the tissue. Professor Yang will report on his lab's recent findings and point out a few applications for this phenomenon.

Professor Yang graduated from MIT in 2002 and has steadily moved towards a warmer climate thereafter. After short stints at ESPCI (Paris) and Duke University, he settled down in Caltech in December 2003. Professor Yang received the NSF CAREER award and the Coulter Foundation Early Career Phase I and II Awards. In 2008 he was named one of Discover Magazine's "20 Best Brains Under 40".