

# 2013 中国科学院上海光学精密机械研究所 青年科技创新论坛第四期

时 间：2013年6月17日上午 地 点：溢智厅

主讲人：俞平 副教授

余平博士是密苏里大学物理和天文学系的副教授。他毕业于南开大学，获得学士(1984)和硕士学位(1987年，师从张光寅教授)，于1997年获得香港科技大学博士学位(师从 Prof. George KL Wong)。他的研究结合了半导体光学，超快激光和生物医学光学成像。余平博士最具代表性的研究成果为：(1) 在ZnO外延薄膜和微观室温条件下受激发射，包括激射增益机制的开拓性工作(香港，1995年-1997年)；(2) 对理解极化和垂直耦合半导体量子点的电子态等研究工作的贡献(丹麦，1999年)；(3) 全息光学相干成像和荧光断层成像的创新性研究(美国普渡大学和密苏里大学)。他目前的研究项目包括光学相干断层扫描，全息光学相干成像，荧光介导的弥漫光子成像、量子光学以及半导体和聚合物设备等领域。他正从事的生物医学成像技术研究在临床预诊和临床成像应用等领域中具有巨大的潜力。



## 演讲题目：Dual-Band Full-Range Fourier Domain Optical Coherence Tomography

Abstract: Optical coherence tomography using low coherence interferometer in the near infrared wavelength regime has shown great potential in biomedical imaging. OCT acquires interferograms of sample and reference, and reconstructs the interferograms into intensity images to show sample microstructures. As commonly known in optical microscopy, it is difficult to differentiate tissue types merely based on the intensity images. Dual-band OCT, which uses light sources covering two distinct wavelength bands, has been shown to be a simple and powerful functional extension of intensity images in OCT. Among various OCT techniques, dual-band full-range Fourier domain OCT (FD-OCT) takes advantage of high sensitivity, speed and interferometric stability of Fourier domain method, and shows many advantages over conventional OCT in coherence domain tissue imaging. However, previous dual-band FD-OCT has a limitation that could not correctly give the tissue spectroscopic contrast due to depth-related discrepancy and tissue attenuation. In this talk, I will review the dual-band FD-OCT techniques and discuss technical challenges in the complex interference. I will present a recent progress in my research group of using an algorithm to correct the depth related fall-off and the light attenuation in the tissue, and a new design of dual-band full-range FD-OCT imaging system using the algorithm. The newly developed dual-band full-range FD-OCT system has been used to study human cancer xenografts and muscle tissues dissected from severely compromised immune deficient mice. With the depth-related compensations, improved sensitivity and corrected tissue spectroscopic contrast were achieved.

## 会议流程

9:40-10:00	致欢迎词、集体合影	主持人 司徒国海 研究员
10:00-10:45	Dual-Band Full-Range Fourier Domain Optical Coherence Tomography	Dr. Ping Yu
10:45-11:05	Molecular Vibrational Cooling by Optical Pumping with Shaped Femtosecond Pulse	李晓林 副研究员
11:05-11:25	Pupil Shaping in the Lithography Illumination System	朱 菁 副研究员
11:15-11:35	Femtosecond Laser Direct Writing of 3D Hollow Structures beyond Diffraction Limit	廖 洋 副研究员



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