

# Frontiers and Challenges in Laser-Based Biological Microscopy

Jeff Squier, Ji-Xin Cheng Program Chairs, Telluride Intermediate School, 725 W. Colorado

TSRC Hosts: Nana Naisbitt, Director, 970-708-0004 and Rory Sullivan Assistant Director, 970-708-4542

Monday	Tuesday	Wednesday	Thursday	Friday
8 to 8:30 Breakfast@TSRC	8 to 8:30 Breakfast@TSRC			8 to 8:30 Breakfast@TSRC
8:30 to 8:45 Welcome J.Squier, Ji-Xin Cheng	8:30 to 9:00 Joachim Mueller			8:30 Conference wrap up session
8:45 to 9:15 Chris Xu	9:05 to 9:35 Julian Moger			
9:20 to 9:50 Paul Wiseman	9:40 to 10:10 Jonathan Liu			
9:55 to 10:25 Alfred Vogel	10:15 to 10:30 Break			
10:30 to 10:45 Break	10:30 to 11:00 Charles Lin			
10:45 to 11:15 Bruce Tromberg	11:05 to 11:35 Na Ji			
11:20 to 11:50 Ji-Xin Cheng	12:00 to 1:00 Catered lunch @TSRC	12:00 to 1:00 Catered lunch @TSRC	12:00 to 1:00 Catered lunch @TSRC	
12:00 to 1:00 Catered lunch @TSRC	1:00 to 1:30 Gereon Huttman	1:00 to 1:30 Peter So	1:00 to 1:30 Eric Betzig	
1:00 to 1:30 Jeff Squier	1:35 to 2:05 Irene Georgakoudi	1:35 to 2:05 Marcus Cicerone	1:35 to 2:05 Adela Ben-Yakar	
1:35 to 2:05 Garth Simpson	2:10 to 2:40 Kishan Dholakia	2:10 to 2:40 Sophie Brasselet	2:10 to 2:40 Emmanuel Beaurepaire	
2:10 to 2:40 Hervé Rigneault	2:45 to 3:00 Break	2:45 to 3:00 Break	2:45 to 3:00 Break	
2:45 to 3:00 Break	3:00 to 3:30 Marcos Dantus	3:00 to 3:30 Brett Bouma	3:00 to 3:30 Virgis Barzda	
3:00 to 3:30 Randy Bartels	3:35 to 4:05 Laurent Cognet	3:35 to 4:05 Rohit Bhargava	3:35 to 4:05 Eric Potma	
3:35 to 4:05 Herman Offerhaus	6PM TSRC Town talk at the Sheridan Opera House, 110 N. Oak	TSRC Picnic @ Ah Haa School for the Arts @ S. 330 Townsend		

**Monday morning, J. Squier presiding**

Chris Xu - In vivo deep tissue multiphoton imaging

Paul Wiseman - New frontiers in image correlation spectroscopy and applications to living cells

Alfred Vogel - Probing the immune and healing response of murine intestinal mucosa by time-lapse 2-photon microscopy of laser-induced lesions with interferometric online dosimetry.

Bruce Tromberg - Developing Multi-photon Microscopy for Clinical Skin Imaging

Ji-Xin Cheng - Seeing the hidden world of biology by label-free spectroscopic imaging

**Monday afternoon, J.X. Cheng presiding**

Jeff Squier – Inexpensive femtosecond sources and precise targeted ablation using simultaneous spatio-temporal focusing

Garth Simpson - Integrating NLO microscopy with synchrotron X-ray diffraction: Is the whole greater than the sum of the parts?

Hervé Rigneault - Fiber based imaging and spectroscopy

Randy Bartels – TBA

Herman Offerhaus - Scanning hyperspectral CARS

**Tuesday morning, A. Ben-Yakar presiding**

Joachim Mueller - Fluorescence fluctuation microscopy in spatially confined cellular compartments

Julian Moger- TBA

Jonathan Liu - Dual-axis confocal microscopy for early detection and surgical guidance

Charles Lin - Ultra-low-throughput (single cell) analysis in vivo

Na Ji - Adaptive Optics Microscopy for In Vivo Imaging

**Tuesday afternoon, Garth Simpson presiding**

Gereon Huttman - Holographic imaging in 3-dimensional scattering tissues by holoscopy

Irene Georgakoudi - Assessing mitochondrial organization and function in 3D tissues using endogenous two-photon excited fluorescence

Kishan Dholakia - Shaping light for biomedical imaging and manipulation

Marcos Dantus - Imaging with ultrabroad bandwidth lasers

Laurent Cognet - Single-molecule and super-resolution microscopies of complex organizations using various nano-probes

**Wednesday afternoon, Randy Bartels presiding**

Peter So - Advances in Image Cytometry

Marcus Cicerone - TBA

Sophie Brasselet - Imaging bio-molecular organization using polarization resolved nonlinear microscopy

Brett Bouma - Cancer imaging with OCT

Rohit Bhargava - Mid-IR chemical imaging: label-free molecular imaging in tissues

**Thursday afternoon, Rohit Bhargava presiding**

Eric Betzig - Principles and Applications of Coherent Structured Light Sheet Microscopy

Adela Ben-Yakar - The role of third harmonic generation microscopy in guiding ultrafast laser microsurgery inside turbid tissue

Emmanuel Beaurepaire - Multicolor and multimodal nonlinear imaging of developing tissue

Virgis Barzda - Super-resolution imaging with interferometric third harmonic generation microscopy

Eric Potma - Advances in sum-frequency generation microscopy