

Sunday, April 3rd

3:00 pm Check-in

6:00 pm Reception (Lobby)

7:00 pm Dinner

8:00 pm **Introduction: Karel Svoboda**, Janelia Farm Research Campus/HHMI
Multiphoton imaging: The last 6×10^{23} femtoseconds

9:00 pm Refreshments available at Bob's Pub

Monday, April 4th

- 7:30 am Breakfast (*service ends at 8:45 am*)
- 9:00 am Session 1: Novel *in vivo* applications**
Chair: Na Ji
- 9:00 am **Na Ji**, Chairperson's introduction
- 9:05 am **Fritjof Helmchen**, Brain Research Institute, University of Zurich
High-speed two-photon calcium imaging of neural dynamics in vivo
- 9:25 am **Daniel Huber**, Janelia Farm Research Campus/HHMI
Long-term imaging of large neuronal ensembles in the mouse motor cortex
- 9:45 am **Jason N. D. Kerr**, Max Planck Institute for Biological Cybernetics
Imaging neuronal population activity in the cortex of freely moving animals: The what where and how
- 10:05 am Break
- 10:40 am **Mark J. Schnitzer**, HHMI/Stanford University
In vivo fluorescence brain imaging in freely moving animals
- 11:00 am **David W. Tank**, Princeton University
Using virtual reality to facilitate biophysical study of neural circuits in awake behaving mice
- 11:20 am **Philbert Tsai**, University of California, San Diego
From photons to flow patterns – Quantifying neurovascular architecture with light microscopy
- 11:40 am General Questions / Discussion
- 12:00 pm Lunch
- 2:00 pm Plenary Lecture: Marc Levoy**, Stanford University
Light field photography, microscopy, and illumination
- 3:00 pm Break
- 3:30 pm Session 2: Different imaging modalities**
Chair: TBD
- 3:30 pm Chairperson's introduction

Multiphoton Imaging: The Next 6×10^{23} Femtoseconds

- 3:50 pm **Emmanuel Beaurepaire**, Ecole Polytechnique / CNRS
Nonlinear microscopy and embryo morphogenesis
- 4:10 pm **Ji-Xin Cheng**, Purdue University
Advanced optical microscopy platforms for label-free imaging
- 4:30 pm **Daniel Côté**, Université Laval, Centre Recherche Robert Giffard
In vivo functional and structural imaging of spinal cord
- 4:50 pm **David Kleinfeld**, University of California, San Diego
Prospects for automated surgery with ultrafast laser pulses
- 5:10 pm General Questions / Discussion
- 5:35 pm Poster Reception
- 7:00 pm Dinner
- 8:00 pm Session 2: Different imaging modalities (continued)**
- 8:00 pm **Seth R. Marder**, Georgia Institute of Technology
The relationship between chemical structure and two photon cross sections in organic molecules
- 8:20 pm **Ryohei Yasuda**, Duke University Medical Center
Postsynaptic signaling mechanisms underlying structural and functional plasticity of dendritic spines
- 8:40 pm General Questions / Discussion
- 9:00 pm Refreshments available at Bob's Pub

Tuesday, April 5th

- 7:30 am Breakfast (*service ends at 8:45 am*)
- 9:00 am Session 3: Deeper imaging: Toward the white matter**
Chair: David Kleinfeld
- 9:00 am **David Kleinfeld**, Chairperson's introduction
- 9:05 am **Martin J. Booth**, University of Oxford
Adaptive optics for nonlinear microscopy of thick biological specimens
- 9:25 am **Meng Cui**, Janelia Farm Research Campus/HHMI
Coherent optical adaptive techniques for two-photon microscopy
- 9:45 am **Na Ji**, Janelia Farm Research Campus/HHMI
A clearer view - Bring adaptive optics to microscopy
- 10:05 am Break
- 10:40 am **Chris B. Schaffer**, Cornell University
Chronic, in vivo imaging of cellular dynamics in the mouse spinal cord after injury
- 11:00 am **Ivo M. Vellekoop**, Code IV Scientific Consulting
Smart light
- 11:20 am **Chris Xu**, Cornell University
Technology development for deep tissue multiphoton imaging
- 11:40 am General Questions / Discussion
- 12:15 pm Lunch
- 1:00 pm Tour (*optional - meet at reception*)
- 2:00 pm Session 4: Molecular sensors and novel expression**
Chair: Luke Lavis
- 2:00 pm **Luke Lavis**, Chairperson's introduction
- 2:20 pm **Mikhail Drobizhev**, Montana State University
How to enhance the two-photon brightness of fluorescent proteins?
- 2:40 pm **Charles Gilbert**, The Rockefeller University
Dynamics of cortical circuits

Multiphoton Imaging: The Next 6×10^{23} Femtoseconds

- 3:00 pm **Loren Looger**, Janelia Farm Research Campus/HHMI
High-contrast probes for multi-photon imaging
- 3:20 pm Break
- 3:50 pm **Pavel Osten**, Cold Spring Harbor Laboratory
Whole-mount two-photon microscopy to study mouse brain circuits
- 4:10 pm Short Talks (*TBD*)
- 5:05 pm General Questions / Discussion
- 5:30 pm Poster Reception
- 7:00 pm Dinner
- 8:00 pm** **Plenary Lecture: Winfried Denk**, Max Planck Institute for Medical Research
Multiphoton-imaging, the first 10^{-9} , or so, ages of the universe
- 9:00 pm Refreshments available at Bob's Pub

Wednesday, April 6th

- 7:30 am Breakfast (*service ends at 8:45 am*)
- 9:00 am Session 5: Beamshaping: Upping the resolution and yield**
Chair: Rafael Yuste
- 9:00 am **Rafael Yuste**, Chairperson's introduction
- 9:20 am **Eric Betzig**, Janelia Farm Research Campus/HHMI
Bessel beam plane illumination microscopy
- 9:40 am **Valentina Emiliani**, University Paris Descartes
Two-photon optogenetics by wave front shaping of ultrafast pulses
- 10:00 am **Bernardo Sabatini**, Harvard University
Supraresolution 2-photon microscopy in complex brain tissue
- 10:20 am Break
- 10:40 am **Yaron Silberberg**, Weizmann Institute
Focusing and compression of ultrashort pulses through scattering media
- 11:00 am **Jeff Squier**, Colorado School of Mines
Differential multiphoton microscopy
- 11:20 am **Alipasha Vaziri**, Janelia Farm Reserach Campus, HHMI
Advances in speed and resolution of imaging and optogenetics using two-photon sculpted light
- 11:40 am General Questions / Final Discussion
- 12:30 pm Lunch and Departure (To-go boxes available in servery for those on first shuttle)
- 1:00 pm First shuttle to Dulles
1:45 pm Second shuttle to Dulles
2:30 pm Last shuttle to Dulles