Full Schedule

Sunday, October 24th

3:00 pm	Check-in
6:00 pm	Reception
7:00 pm	Dinner
8:00 pm	Welcome and opening remarks (Gerry Rubin)
8:10 pm	**Plenary Talks**
8:10 pm	**Jeff W. Lichtman**, Harvard University *The future of the connectome*
8:40 pm	**Charles F. Stevens**, Salk Institute *Principles of arbor structure*
9:10 pm	Refreshments available at Bob's Pub

Monday, October 25th

7:30 am Breakfast

9:00 am Session 1: Genetic Methods

PART 1
Chair: Gerry Rubin

9:00 am **Chairperson's Introduction**

9:10 am **Herwig Baier**, University of California, San Francisco
Genetic and optical targeting of neural circuits underlying behavior in zebrafish

9:20 am **Andreas H. Burkhalter**, Washington University in St. Louis
Modular organization of mouse visual cortex

9:30 am **Hollis Cline**, The Scripps Research Institute
Control of neurogenesis and integration of neurons into functional circuits

9:40 am **Seth Grant**, The Wellcome Trust Sanger Institute
Visualizing postsynaptic complexes in vivo

9:50 am **Z. Josh Huang**, Cold Spring Harbor Laboratory
Towards a genetic dissection of GABAergic inhibitory circuits in neocortex

10:00 am **Troy Margrie**, National Institute for Medical Research (NIMR)
Genetic manipulation via whole-cell recording in vivo: Bridging single-cell physiology, genetics and connectomics

10:10 am Break

10:50 am **Sacha B. Nelson**, Brandeis University
Defining the mammalian neurome: A critical step in mapping the connectome

11:00 am **Gerald M. Rubin**, Janelia Farm Research Campus/HHMI
Developing genetic tools for studying the anatomy of the Drosophila nervous system

11:10 am **Aljoscha Nern**, Janelia Farm Research Campus/HHMI
Genetic dissection of visual system neuroanatomy using multicolor stochastic labeling

11:20 am **Dawen Cai**, Harvard University
Neuron tracing of Brainbow multi-color fluorescence data using mean-shift

11:30 am **Julie Simpson**, Janelia Farm Research Campus/HHMI
Drosophila Brainbow: A recombinase-based fluorescent labeling technique to subdivide neural expression patterns

11:40 am Open Discussion (Discussion Leader: Holly Cline)

12:30 pm Lunch

PART 2
Chair: Loren Looger

2:00 pm **Chairperson's Introduction**

2:10 pm **Kang Shen**, HHMI/Stanford University
Forward genetic analysis of precise positioning of synapses in C. elegans

2:20 pm **Atsushi Miyawaki**, RIKEN Brain Science Institute
3D quantifying the association of proliferative neural stem cell nuclei with blood vessels in the SGZ

2:30 pm **Josh Morgan**, Harvard University
Excitatory inputs refine their connectivity with a shared target neuron in a cell-type specific manner

2:40 pm **Tzumin Lee**, Janelia Farm Research Campus/HHMI
Reconstruction of Drosophila olfactory circuitry by high-resolution cell lineage analysis

2:50 pm **James W. Truman**, Janelia Farm Research Campus/HHMI
Developing tools for marking neuronal lineages

3:00 pm **Hongkui Zeng**, Allen Institute for Brain Science
Towards a genetically-based connectional atlas for the adult and developing mouse brains

3:10 pm Open Discussion (Discussion Leader: Jim Truman)

3:40 pm Break

4:30 pm **Session 2: Cytochemistry**
Chair: Ian Wickersham

4:30 pm **Chairperson's Introduction**

4:40 pm **Roger Y. Tsien**, HHMI/University of California, San Diego
Genetically encoded singlet oxygen generator for electron microscopic visualization

4:50 pm **Kenneth Fish**, University of Pittsburgh
Target specific differential expression of synaptic proteins in terminals of individual GABAergic neurons

5:00 pm **Andreas Jeromin**, Banyan Biomarkers
High-resolution imaging of projections in brain

5:10 pm **Joel Kralj**, Harvard University
Fluorescent optogenetic probe for measuring membrane potential

5:20 pm **Ian Wickersham**, Massachusetts Institute of Technology
High-resolution fluorescent labeling with recombinant rabies virus: Cytoplasmic, synaptic, and nuclear markers, retrograde and anterograde delivery

5:30 pm **Open Discussion (Discussion Leader: Andreas Jeromin)**

6:00 pm Reception

7:00 pm Dinner

8:00 pm Refreshments available at Bob's Pub

Tuesday, October 26th

7:30 am **Breakfast**

9:00 am **Session 3: Light-based acquisition strategies**

PART 1: MULITPHOTON IMAGING AND NANOSCOPY
Chair: Ju Lu

9:00 am **Chairperson's Introduction**

9:10 am **Orkun Akin**, University of California, Los Angeles
Live imaging of Drosophila visual system development with two photon microscopy

9:20 am **Pavel Osten**, Cold Spring Harbor Laboratory
3D-2P microscopy: Three-dimensional two-photon microscopy for fluorescent mouse brain

9:30 am **Michael P. Stryker**, University of California, San Francisco
Functional and structural aspects of activity-dependent plasticity in developing visual cortex

9:40 am **Karel Svoboda**, Janelia Farm Research Campus/HHMI
Optophysiological methods to map complex neural circuits

9:50 am **Yi Zuo**, University of California, Santa Cruz
Imaging structural remodeling in the living brain during motor skill learning

10:00 am Break

10:40 am **Eric Betzig**, Janelia Farm Research Campus/HHMI
Bessel beam plane illumination microscopy

10:50 am **Ju Lu**, Stanford University
Super-resolution laser scanning microscopy through spatiotemporal modulation

11:00 am **Tom Mrsic-Flogel**, University College London
Mapping functional organization of local synaptic connections in cortical networks

11:10 am **Xiaowei Zhuang**, HHMI/Harvard University
Neuronal connectivity imaging by super-resolution fluorescence microscopy

11:20 am **Open Discussion (Discussion Leader: Karel Svoboda)**

12:00 pm Lunch

1:00 pm Tour (optional - meet at reception)

2:00 pm Session 3: Light-based acquisition strategies (continued)

PART 2: ARRAY TOMOGRAPHY
Chair: Stephen Smith

2:00 pm **Chairperson's Introduction**

2:10 pm **Kristina D. Micheva**, Stanford University
Single synapse analysis of mouse somatosensory cortex using array tomography

2:20 pm **Jennifer Colonell**, Janelia Farm Research Campus/HHMI
Assessing reconstruction quality from optical array tomography

2:30 pm **Brad Busse**, Stanford University
Single synapse quantification with array tomgoraphy

2:40 pm **Daniele Oberti**, Institute of Neuroinformatics, University and ETH Zürich
Correlative microscopy of densely labeled projection neurons using neural tracers

2:50 pm **Stephen J. Smith**, Stanford University School of Medicine
Linking neuron and synapse types by array tomography

3:00 pm **Mariano Soiza-Reilly**, Children's Hospital Boston, Harvard Medical School
Analysis of glutamatergic innervation of the mouse dorsal raphe nucleus using array tomography

3:10 pm Open Discussion (Discussion Leader: Kristina Micheva)

3:50 pm Break

4:30 pm Session 4: Integration of LM and EM data
Chair: Winfried Denk

4:30 pm **Chairperson's Introduction**

4:40 pm **Randy M. Bruno**, Columbia University
Light-based mapping of synapses along complete dendritic arbors with validation by electron microscopy

4:50 pm **Shin-ya Takemura**, Janelia Farm Research Campus/HHMI
Reconstructing synaptic circuits in Drosophila visual system

5:00 pm **Winfried Denk**, Max-Planck-Institute for Medical Research
Combining two-photon activity mapping with SBF-SEM based circuit reconstruction in the retina

5:10 pm **Robert Marc**, University of Utah School of Medicine
Fusing optical molecular and transmission electron microscope imagery

5:20 pm **Albert Cardona**, University of Zurich and ETH Zurich
Ventral nerve cord circuitry of Drosophila larva with synaptic resolution

5:30 pm **Open Discussion (Discussion Leader: Mitya Chklovskii)**

6:00 pm Reception

7:00 pm Dinner

8:00 pm Refreshments available at Bob's Pub

Wednesday, October 27th

7:30 am Breakfast

9:00 am Session 5: Informatics - Building atlases and image analysis tools
Chair: Gene Myers

9:00 am **Chairperson's Introduction**

9:10 am **Giorgio A. Ascoli**, George Mason University
Intrinsic potential synaptic connectivity in a cellular-level 3D model of the rat hippocampus

9:20 am **Partha P. Mitra**, Cold Spring Harbor Laboratory
The mouse brain architecture project

9:30 am **Hanchuan Peng**, Janelia Farm Research Campus/HHMI
A brain-wide compartment wiring map of the Drosophila nervous system using 1000 GAL4 lines

9:40 am **Douglas Armstrong**, University of Edinburgh
Making sense of neural circuit data

9:50 am **Luca Fiaschi**, University of Heidelberg
Learning-based segmentation

10:00 am Break

10:40 am **Eugene W. Myers**, Janelia Farm Research Campus/HHMI
On the informatics for light-based atlases of neural systems

10:50 am **Badri Roysam**, University of Houston
Automated image analysis toolkit for cytovascular mapping of brain tissue from 3-D multi-channel optical microscopy data

11:00 am **Sebastian Seung**, HHMI/Massachusetts Institute of Technology
Finding the shapes of neurons using machine learning and digital topology

11:10 am **Srinivas C. Turaga**, Massachussetts Institute of Technology
Learning to segment electron microscopic images with MALIS

11:20 am Open Discussion (Discussion Leader: Doug Armstrong)

11:50 am Final comments and closing discussion (moderated by the organizers)

12:30 pm	Lunch and Departure (To-go boxes available 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