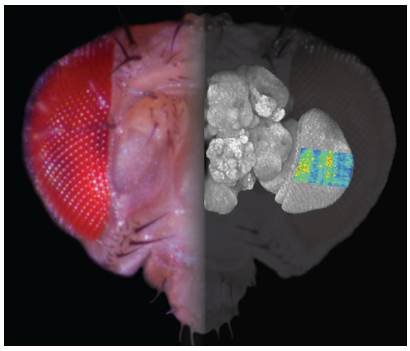
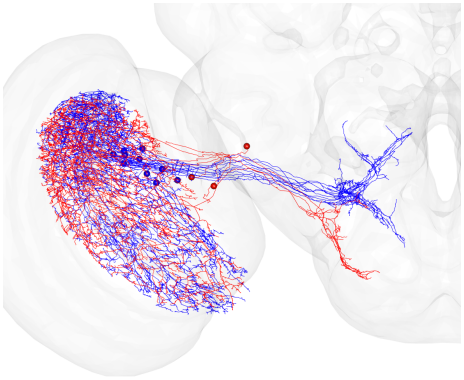
## Postdoctoral / Research Specialist position in Computational Anatomy



The **Reiser lab** at the **Janelia Research Campus** seeks a creative scientist to join our endeavor to understand circuit transformations in the *Drosophila* brain. We use imaging, behavioral, anatomical, electrophysiological, and computational techniques to crack the neural circuits for vision and navigation in *Drosophila*. This is an exciting time to be working on the fly visual system— one of the best described complex circuits in neuroscience.

We are now living through the golden age of *Drosophila* anatomy, ushered by a much-improved genetic toolkit, advances in light microscopy (LM), and connectomic reconstructions from electron microscopy (EM) data. Brain regions that were once too complex to be studied at the level of identified neurons, can now have their cells and circuitry catalogued. But these efforts are held back by a lack of computational and analytical tools. Neurons of the fly visual system lend themselves directly to structure-function questions. How much of a neuron's function could be predicted from its morphology and circuit connectivity?

In this position you would lead our efforts to analyze several LM and EM datasets. The specific aim is to establish the central representation of visual information in the fly. Many projects are possible, related to active research topics in the lab:



- Unravelling the representation of visual space in the optic lobes and following this representation into the central brain.
- predicting the flow field selectivity of optic flow sensing neurons from their morphology (and collaborating with others in the lab to measure these responses)
- elucidating the circuit mechanisms giving rise to feature detection in identified neurons. Directional selectivity is an especially active topic.
- following visual pathways out of the visual system and into the central brain to identify the architecture of behavioral control centers
- discovering the organization of feedback pathways from the central brain into the visual system that modulate sensory neurons in response to the behavioral state of the animal
- Post-connectome projects, such as localizing critical proteins, especially ion channels, to specific neuronal compartments. Analysis of Expansion Microscopy data.

Several computational extensions of these research areas would be encouraged:

- applications of machine learning to these data sets
- single neuron biophysical modeling
- dynamical systems and network modeling

All of these projects would involve direct collaborations with experimentalist in the lab and computational neuroscientists within Janelia, forming a tight loop between anatomical discovery and experimental methods. A hybrid position is also possible, starting with a focus on the analysis of EM data and then moving on to a functional analysis of these neurons.

**Requirements:** Ph.D. in a quantitative field, familiarity with diverse computing environments, comfort with geometric relationships in three-dimensions, and a keen interest in figuring out the brain. Experience in computational anatomy and/or experimental or computational neuroscience is a big plus. Interested applicants should apply by email; please include your curriculum vitae and research interests, and arrange for three letters of reference to be sent to reiserm@janelia.hhmi.org.

*If you have specific salary requirements, please include them in your e-mail; all information is confidential. HHMI is an equal opportunity employer.*