Postdoctoral Position:
Advanced Neuro-Imaging & Technologies

VAZIRI LAB
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http://www.rockefeller.edu/research/faculty/labheads/AlipashaVaziri/#content

Background

Emergence of new optical technologies combined with advanced statistics and machine learning tools have led to major advances of our understanding of how the circuitry and dynamic s of neuronal population give rise to brain functions and behavior.

The Vaziri Lab of Neurotechnology and Biophysics has a major focus on the development and application of advanced optical imaging technologies with applications for systems neuroscience. Over the last few years we have developed a portfolio of optical techniques that allow near-simultaneous stimulation [1, 2] and functional imaging of neuronal activity on the whole-brain level at single-cell level in small model organisms [3, 4] and more recently in the more scattering rodent brain [5-8]. These tools are now being used to answer some of the most fundamental questions in neuroscience: How does the spatiotemporal dynamics of neuronal population activity generate behavior? How is the variability of behavior linked to the variability of neuronal dynamics? What are the neuro computational principles that facilitate cognitive brain functions?

Positions

To further push the development of advanced neurotechnologies, we are currently looking for highly motivated and ambitious candidates in the following areas:

- **Development of new high-speed optical methods for large scale recoding of neuroactivity**
- **Imaging through scattering media**
- **Computational imaging technologies using machine learning and advanced statistics**
- **New conceptual applications of quantum optics and ultrafast optics to bioimaging and biology**

Qualifications

- Highly motivated, ambitious and goal-driven
- PhD in **physics, (quantum) optics, optical / electrical engineering or systems neuroscience**
- Prior experimental work on one and more of these areas would be highly desired: designing and building **optical setups** or instruments, ultra-fast optics, fiber optics, AMO physics, light/matter interaction, statistical data analysis, systems neuroscience, craniotomy surgery, rodent behavior
- Basic programming skills (e.g. Matlab, Python, LabView)
- Ability to work in an interdisciplinary team, managing multiple tasks, good organizational and communication skills and willingness to work outside their core expertise.

Interested candidates should send their CV including publications, copy of transcripts as well as the contact information of two references to vaziri@rockefeller.edu For more information please visit our website www.vaziria.com

References
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3. Schrodel, T., et al., *Brain-wide 3D imaging of neuronal activity in Caenorhabditis elegans with sculpted light.* **Nature Methods**, (2013). 10(10): p. 1013-1020.
4. Prevedel, R., et al., *Simultaneous whole-animal 3D imaging of neuronal activity using light-field microscopy.* **Nature Methods**, (2014). 11(7): p. 727-730
5. Robert, R. et al., *Fast volumetric calcium imaging across multiple cortical layers using sculpted light*. **Nature Methods,** (2016) 13, 1021-1028
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7. Nöbauer, T., et al., Video rate volumetric Ca2+ imaging across cortex using seeded iterative demixing (SID) microscopy. **Nature Methods**, (2017). 14, 811-81.
8. Weisenburger, S. et al., Volumetric Ca2+ Imaging in the Mouse Brain using Hybrid Multiplexed Sculpted Light (HyMS) Microscopy. **Cell** (2019), *in press*