Postdoctoral Position:
Large-Scale Neuroimaging and Applications

VAZIRI LAB
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Description:
Emergence of new optical technologies combined with advanced computational and molecular tools have led to major advances of our understanding of how the circuitry and dynamics of neuronal population give rise to brain functions and behavior.

Our lab has been focused on the development and application of advanced optical imaging technologies to advance neuroscience. Over the last few years, we have developed a portfolio of optical technologies that allow near-simultaneous large-scale recording of neuroactivity, in some cases, up to the level of entire brains [1-6]. In our most recent imaging technology, we have shown that **up to 1 million neurons** distributed across different depths of both hemispheres of the mouse cortex can be recorded at single cell resolution [7].

Which fundamental questions in neuroscience would you be able to uniquely address with such capabilities, and how would you push imaging technologies further?

We are welcoming applications from creative, highly motivated, and ambitious candidates interested in pursuing projects based on their own ideas or within existing lines of work in the lab in either of the above areas.

Qualifications:
- Highly motivated, ambitious, and goal-driven
- Ph.D. 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, systems neuroscience, statistical data analysis, 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 application materials, including CV/resume, list of publications, copy of transcripts, and the contact information of at least two references to vaziri@rockefeller.edu. For more information, please visit our website https://vaziri.rockefeller.edu/.

References
1. 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.
2. Prevedel, R., et al., *Simultaneous whole-animal 3D imaging of neuronal activity using light-field microscopy.* **Nature Methods**, (2014). 11(7): p. 727-730
3. Robert, R. et al., *Fast volumetric calcium imaging across multiple cortical layers using sculpted light.* **Nature Methods,** (2016) 13, p. 1021-1028
4. Skocek,O., et al., *High-speed volumetric imaging of neuronal activity in freely moving rodents*. **Nature Methods,** (2018). 15, p. 429–432.
5. Nöbauer, T., et al., *Video rate volumetric Ca2+ imaging across cortex using seeded iterative demixing (SID) microscopy*. **Nature Methods**, (2017). 14, p. 811-81.
6. Weisenburger, S. et al., *Volumetric Ca2+ Imaging in the Mouse Brain using Hybrid Multiplexed Sculpted Light (HyMS) Microscopy*. **Cell** (2019), 180, p. 1-16.
7. Demas, J., et al., *High-Speed, Cortex-Wide Volumetric Recording of Neuroactivity at Cellular Resolution using Light Beads Microscopy*, **Nature Methods** (2021), *in revision (bioRxiv preprint: https://www.biorxiv.org/content/10.1101/2021.02.21.432164v2)*