

**Visiting Student, Graduate Student or Postdoctoral Scholar- Optics and Photonics Scientist for Large Scale Recordings and Manipulations in the Brain**

We are looking for a visiting student, a graduate student or a postdoctoral scholar who will design and implement opto-mechanical systems such as multiphoton microscopes and/or fiber laser systems for performing in vivo and in vitro large-scale optogenetics and imaging experiments. With these systems, we would like to understand how neural circuits generate patterned activity that gives rise to complex behaviors and phenotypes in health and disease states. It is fully funded positions. Extending its duration is possible depending on the project outcomes.

**Who we are**: We are highly-motivated multi-disciplinary research group focuses on cracking brain complexity in the lens of engineering, optics, photonics, behavioral and computational neuroscience for basic and translational neuroscience questions. Please visit our website, and check our lab policy and diversity, equity and inclusion (DEI) (**yildirimlab.org**).

**Who we are looking for**: We are looking for a curious scientist and/or engineer who is interested in working in a team-oriented environment and interested in making new discoveries in the basic and translational neuroscience. This position is ideal for someone with a desire to use their engineering and optics skills to develop next-generation optical microscopes as well as fiber lasers and to gain skillsets for large-scale recordings, manipulations, and behavioral experiments. These technologies will help us to dissect neural circuits responsible for animal behavior in health and disease states.

**Responsibilities:** It is required to have a undergraduate, and/or doctoral degree in Engineering and/or Physics, and to have expertise on one of these following topics: fluorescence microscopy, multiphoton microscopy, fiber laser development, Fourier optics, image processing, machine learning, optimization, compressive sensing, brain functional imaging, and optogenetics. It is also required to have strong expertise with coding (MATLAB, R, or Phyton), excellent organizational, analytical, and oral and written communication skills, ability to analyze data and present it in a format suitable for publication, self motivation, and ability to function effectively in a team-oriented environment.

**Preferences**: It is preferred to have an undergraduate and/or doctoral degree in Physics, Mechanical, Electrical or Biomedical Engineering, and to have an expertise in multiphoton imaging and/or in fiber laser development. Interested candidates should submit CV, and contact information of three references to Dr. Murat Yildirim, via email: **yildirm2@ccf.org.**

References:

1. Le, N. M., Yildirim, M., Wang, Y., Sugihara, H., Jazayeri, M., & Sur, M. (2023). Mixtures of strategies underlie rodent behavior during reversal learning. PLOS Computational Biology, 19(9), e1011430.
2. Wijethilake, N., Anandakumar, M., Zheng, C., So, P. T., Yildirim, M., & Wadduwage, D. N. (2023). DEEP-squared: deep learning powered De-scattering with Excitation Patterning. Light: Science & Applications, 12(1), 228.
3. Yildirim, M., Delepine, C., Feldman, D., Pham, V., Chou, S., Ip, J.P.K., Nott, A., Tsai, L.H., Ming, G.L., So, P.T. and Sur, M., 2022. Label-free three-photon imaging of intact human cerebral organoids: tracking early events in brain development and deficits in Rett Syndrome. *bioRxiv*.
4. Rikhye, R. V., Yildirim, M., Hu, M., Breton-Provencher, V., & Sur, M. (2021). Reliable sensory processing in mouse visual cortex through cooperative interactions between somatostatin and parvalbumin interneurons. *Journal of Neuroscience*, *41*(42), 8761-8778.
5. Yildirim, M., Hu, M., Le, N. M., Sugihara, H., So, P. T., & Sur, M. (2020). Quantitative third-harmonic generation imaging of mouse visual cortex areas reveals correlations between functional maps and structural substrates. *Biomedical Optics Express*, *11*(10), 5650-5673.
6. Yildirim, M., Sugihara, H., So, P. T., & Sur, M. (2019). Functional imaging of visual cortical layers and subplate in awake mice with optimized three-photon microscopy. *Nature communications*, *10*(1), 1-12.