

## Optical Techniques in Neurobiology:

### Supercontinuum light sources and fiber technologies

With this PhD fellowship, sponsored by the Lundbeck Foundation at the University of Aarhus in Denmark, we wish to initiate an interdisciplinary collaboration combining state of the art light sources and beam shaping techniques with direct neurobiological experiments. The student will work in a collaboration encompassing Dr. Duda Kvitsiani at the Dandrite Center for Neurobiology, Aarhus University and Professor Keiding, Femtolab, Department of Chemistry, Aarhus University. In addition, NKT-Photonics, Co manufacturing advanced optical fibers and light sources will be affiliated with the project as well as an international university. The aim of the PhD project is twofold: **Implementing supercontinuum sources** (provided by NKT-Photonics) as a new flexible and versatile light source for wavelength selective fluorescence excitation used in optogenetical studies of decision-making processes in behaving mice. **Multimode fiber imaging and excitation delivery**: how to pattern light delivered to the brain? Using holographic techniques and advanced optical fibers, we will investigate the possibility of controlling the position of the excitation spot as well as localizing the subsequent fluorescence spots. This will require considerable expertise in both fiberoptical techniques, beam shaping using Fourier optics and computational de-convolution algorithms. The PhD student will be jointly supervised by Duda Kvitsiani and Søren Keiding.

We expect a candidate with a strong background in for example experimental physics/optics, nanoscience, chemistry, or optical engineering with good analytical skills. For further information on how to apply, please consult the homepage of the Aarhus Graduate School of Science and Technology:

<http://talent.au.dk/phd/scienceandtechnology/opencalls/>

For more information concerning the project you are welcome to contact the supervisors directly:

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