

Ph.D. position in nanoscale quantum magnetic and electric-field sensing of neurons using nitrogen-vacancy centers in diamond



We are looking for a doctoral student that will work on the **development of an ultrasensitive quantum sensor based on nitrogen-vacancy sensors in diamond** for real-time recording of neural activity on the sub-neuron, single neuron and cultured neural network level. This interdisciplinary research project at the edge of physics, neuroscience and biotechnology aims to advance **quantum sensor and brain imaging technologies** for a better understanding of neural information processing. The nitrogen-vacancy defect (or NV center) in the crystal structure of the diamond is a unique system which has 'atom-like' quantum properties and forms the base for an ultra-sensitive device that can sense magnetic and electrical fields via its spin states, which can be read-out optically using electron spin resonances.

Applicants should have a Master degree (or similar) in a subject relevant for the research, such as physics, electro-optical or nano-engineering. Applicants are expected to have good skills in experimental physics, electro-optics or nanotechnology. Programming skills (Matlab, Python) and knowledge of quantum physics are desirable. Applicants must be strongly motivated for doctoral studies and possess the ability to work independently in an interdisciplinary research team. The project is performed in collaboration with an internationally renowned group in Germany (Quantum Optics Group, University of Ulm, Prof. Jelezko). Frequent visits of the successful candidate to our partner Institute in Germany are expected. Good command of English, in writing and speaking, is a prerequisite for presenting research results in international periodicals and at conferences.

The position is a research position for 4 years. The starting date is open for discussion, though ideally we would like the successful candidate to start as soon as possible. Please send your CV and a short statement of motivation to Dr. Armin Biess, Department of Industrial Engineering and Management (abiess@bgu.ac.il).