PostDoc and PhD positions available

Miniaturization of optically pumped alkali magnetometers (OPMs)

As part of an international research project, we want to broaden and improve the applicability of optically pumped magnetometers (OPM). These magnetometers belong to the new field of "quantum technologies", in which one wants to use photonic or atomic quantum states as a new sensing technology. At their core, OPM are small laser spectrometers in which the otherwise perturbing magnetic field dependency of the absorption spectrum is exploited to measure an external magnetic field. Thus, OPM enable the measurement of extremely weak magnetic fields with comparably little effort.

The core topic of the project is the development of particularly compact, highly integrated sensors using microsystem technology (MST) methods. The work will be done as part of an **international research project** in cooperation with Prof. Svenja Knappe (**University of Colorado Boulder, USA**, Svenja Knappe's website) who is one of the pioneers of microfabricated OPMs. The subject of the work will be the conception and implementation of optical, mechanical, and electrical components of the OPM, with the aim of further miniaturization and improvement of the detection sensitivity.

The position is based under the **Laboratory for Optical Systems at IMTEK** (Prof. Karsten Buse). Part of the work will be carried out in Svenja Knappe's working group, in close cooperation with the group **"Nonlinear optics and quantum sensing" at Fraunhofer IPM** Freiburg (Dr. Frank Kühnemann; Quantum Magnetometry website).

Ph.D. position: Candidate with an above-average master's degree in physics, photonics, microsystems technology, or the like. interest in working in a challenging research topic and the ability to work independently in an interdisciplinary environment of physicists and engineers. The employment is based on a 75% E13 job for 3 years.

Postdoc position: Ph.D. in experimental physics, experience in magnetometry with OPM. Background in atomic physics /optical pumping is advantageous. Experience with commercial OPM would be nice. The employment is based on a 100 % E13 job for two years.

For both positions: very good English and German language skills and the willingness to undertake longer research stays at the University of Colorado Boulder.

Interested? Apply!

Applications (letter of motivation, curriculum vitae, certificates) are requested to PD Dr. Ingo Breunig (ingo.breunig@imtek.de) until 31.05.2022. He will also be happy to answer questions about the job advertisement.