Opening for a PhD position in Quantum Sensing and Optical Magnetometry at the University of Nottingham (UK)

This PhD project is aimed at developing highly sensitive methods for detection of magnetic fields with optically pumped magnetometers. The magnetometer will be based on laser-interrogation of room-temperature cesium or rubidium atomic vapor. The project will include work on designing a prototype magnetometer. Quantum techniques such as spin-squeezing can be used for improving the magnetic field sensitivity. Possible applications of this magnetometer include measuring bio-magnetic signals from the heart or brain. Such measurements can be done in the magnetically shielded room at Uni. of Nottingham.

The applicant should either have or be about to graduate with a Master's degree in Physics or another relevant field. Previous experience with experimental quantum physics, lasers, optics, data-acquisition, and electronics will be beneficial.

The successful candidate will take part in establishing a new, young research team lead by Dr. Kasper Jensen. The PhD student will also be part of the "Cold Atom and Quantum Optics Group" at the School of Physics and Astronomy, University of Nottingham, which currently includes 4 faculty members and their teams of postdocs, PhD students, and undergraduate students working on experimental quantum physics.

Interested applicants should send an informal application (including a CV) to the project supervisor Dr Kasper Jensen by email: Kasper.Jensen@nottingham.ac.uk. Applications will be looked at as they come in. A formal application to the University of Nottingham is required at a later stage. Possible start dates for the PhD are: Feb 1st, April 1st or July 1st in 2019.

Previous work related to this PhD project include:

- K. Jensen et al. *Magnetocardiography on an isolated animal heart with a room-temperature optically pumped magnetometer.* Scientific Reports **8**, 16218 (2018). arxiv.org/abs/1806.10954
- K. Jensen et al., *Non-invasive detection of animal nerve impulses with an atomic magnetometer operating near quantum limited sensitivity.* Scientific Reports **6**, 29638 (2016). arxiv.org/abs/1601.03273
- G. Vasilakis et al. *Generation of a squeezed state of an oscillator by stroboscopic back-action-evading measurement.* Nature Physics **11**, 389 (2015). arxiv.org/abs/1411.6289
- W. Wasilewski et al. *Quantum noise limited and entanglement-assisted magnetometry.* Physical Review Letters **104**, 133601 (2010). arxiv.org/abs/0907.2453

Online information:
School of Physics and Astronomy at the University of Nottingham: nottingham.ac.uk/physics/
Cold Atom and Quantum Optics Group: nottingham.ac.uk/physics/research/coldatomsgroup/home.aspx
Kasper Jensen: nottingham.ac.uk/physics/people/kasper.jensen

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