

PhD position: Nanoscale magnetic imaging of condensed-matter systems using a single-spin sensor.

Research: Quantum Sensing

Research in the van der Sar Lab focuses on exploring condensed-matter physics using nanoscale magnetic-field sensing. A central role is played by the nitrogen-vacancy (NV) spin in diamond, which is an atomic-sized magnetic-field sensor that can be controlled using methods from quantum information processing. Because NV magnetometry is extremely sensitive, has a large dynamic frequency range, and is compatible with a wide range of temperatures, it provides an excellent platform for exploring condensed-matter phenomena such as magnetism and superconductivity.

Job description

In this project you will explore the physics of quantum materials and devices through nanoscale magnetic field sensing. You will set up a state-of-the-art scanning single-NV magnetic imaging system, and use it to study samples with interesting magnetic textures, magnetic excitations, and electrical current distributions. This project will combine correlated-electron physics, quantum optics, and quantum information with scanning probe microscopy. Moreover, it will provide the excitement of traveling into unexplored territories of condensed-matter physics at the nanoscale.

Requirements

I am looking for an enthusiastic, talented candidate with an MSc degree in physics or a related field. Experience with spin physics, optics, scanning probe microscopy, and/or cryogenics is desirable, but not required. Most importantly, the candidate should be fascinated by exploring fundamental condensed-matter physics and developing state-of-the-art measurement techniques. Fluency in English is essential.

Location

The van der Sar Lab is part of the department of Quantum Nanoscience in the world-famous Kavli Institute of Nanoscience at Delft University of Technology. Delft is a lively university town close to larger cities as The Hague and Rotterdam (both <15 minutes by train) and Amsterdam (about an hour by train).

How to apply

Would you like to experience the excitement of using a single spin to explore the physics of quantum materials in the lab? Please apply by sending a CV and Cover Letter to t.vandersar@tudelft.nl. The start date is ~Dec. 2017 but can be discussed.

