



Opportunities  
for Talents

TUM

Technische Universität München

The **Emmy-Noether research group on quantum sensing at the Walter Schottky Institute of TU Munich** invites applications for

## Postdocs / PhD students

### The group

The quantum sensing group is an independent research group at the Walter Schottky Institute of TU Munich, led by Friedemann Reinhard. It seeks to translate cutting edge basic research into novel sensors and discover their applications.

A core tool of the group are diamond quantum sensors for magnetic fields.

More information can be found on our website <http://tinyurl.com/reinhard-quantum-sensing>.

### Your project

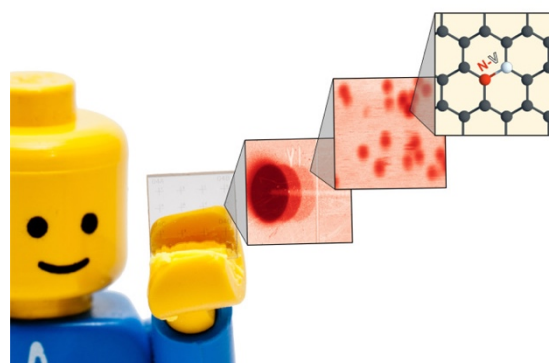
You will spearhead one major research effort of our lab, directed either towards development of new sensors or discovery of new applications. Specifically, this could be work on one of the following topics

- **Magnetic Resonance Microscopy.** You will use atomically small quantum sensors to perform NMR and EPR spectroscopy on nanometer to micrometer small samples, reveal the inner working of Lithium batteries and acquire three-dimensional pictures of single proteins.
- **Detection and imaging of electrical signals in neurons,** the cells performing computation in our brain. You will work towards this goal by one of two complementary approaches: testing new quantum materials for their use as sensors or improving signal acquisition by modern image processing based on artificial intelligence.
- **Magnetic imaging and near-field microscopy.** We operate a scanning probe microscope that can position a sensor in nanometer-scale proximity to samples. You will use this platform to reveal patterns of current in integrated circuits, to map patterns of light at the nanoscale, or to assemble nano-optical devices.
- **Electric interface to quantum sensors.** We have recently discovered a technique for all-electric readout of solid-state spins, based on cavity-QED techniques in a high-quality microwave resonator. You will develop new protocols and hybrid quantum-classical circuits to establish solid state spins as a new electric circuit element. You will employ these circuits as compact magnetic field sensors and apply them to novel applications.

Technically, your work will involve the design and construction of optics and electronics, clean room fabrication and software development, as well as theory and simulation work.

### Your application

Applications should be sent to [friedemann@quantum-minigolf.org](mailto:friedemann@quantum-minigolf.org). Please include your CV, a copy of your most recent thesis and the transcript of grades of your BSc studies.



*A diamond sensor chip of our experiments (held by the lego man). Single NV centers are visible under a microscope (red dots). Each of them is an atomically small sensor for magnetic fields.*



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TUM is an equal opportunity employer. TUM aims to increase the proportion of women and therefore particularly welcomes applications by women. Applicants with severe disabilities will be given priority consideration given comparable qualifications.