

PhD in Vector field magnetic imaging

Job description:

We offer a 3 year PhD position *in Vector field magnetic imaging*, shared between TU Wien and University of Vienna, in Austria.

The project is funded via the FGG project “VMAG”: Supervisors: Prof. Dr. Amalio Fernández-Pacheco (TU Wien) and Dr. Claas Abert (Uni Wien).

Other partners involved: University of Krems and c-sense GmbH

Resolving all three components of magnetic stray fields with nanoscale resolution is crucial for developing new generations of magnetic devices. Consequently, vector magnetic imaging, which captures all three field components, is a highly active area of research. Significant advancements have been made in X-ray and electron microscopy, particularly through the development of advanced tomographic techniques. However, these methods require large facilities, such as synchrotrons or extensive electron microscopy centres, limiting their accessibility and applicability.

In this project, we will develop a new experimental and computational platform to perform vector magnetic imaging using a new generation of three-dimensional magnetic sensors. The resulting devices will be integrated in chips developed at the University of Krems, and tested for subsequent commercialization by the industrial partner of the project.

Activities:

- 3D nanofabrication using state-of-the-art direct-write nanolithography.
- Optical and electrical characterisation of the devices.
- Modelling and optimization of the devices using micromagnetic tools.
- Testing and validation of the sensors.
- Technology transfer and commercialization of the devices.

The complementary expertise of the two host groups, combined with the wide range of technical skills to be acquired and involvement in the entire process—from the design, characterization, and modelling of the sensors to their commercialization—presents an exceptional opportunity for the candidate to become a highly qualified professional with a broad skill set. We are therefore seeking a highly motivated candidate eager to embrace this challenge.

For more information about research groups, visit:

<https://www.tuwien.at/en/phy/iap/3dnano>

<https://fun.univie.ac.at/>

Profile of the candidates:

Applicants should have a MSc, MSci or MRes in physics, maths, materials science, or a discipline relevant to the project, and hold or be on track for a First Class degree result (or equivalent).

Previous experience in areas such as nanofabrication, electron microscopy, scanning probe microscopy, characterization and modelling of nano-devices, as well as solid computing skills, are very desirable.

The successful candidate should have good interpersonal skills, be able to carry out inter-dependent research activities within a team, enjoy challenging work, and be willing to visit collaborators, attend conferences and perform synchrotron experiments.

Details of the job:

Starting date and duration: Flexible starting date, from 1st September 2024.

Salary:

<https://www.fwf.ac.at/foerdern/schritte-zur-erfolgreichen-foerderung/weitere-informationen/personalkosten>

Deadline: Until the position is filled.

How to apply:

Applications should be sent to amalio.fernandez-pacheco@tuwien.ac.at and claas.abert@univie.ac.at, with the subject "VMAG PhD application", and a single .pdf file as an attachment with three sections: (1) a cover letter (max length of 2 pages) describing your previous research experience and what motivates you to work in this project; (2) a full CV; (3) contact details of two referees. Female applicants are explicitly encouraged to apply.



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