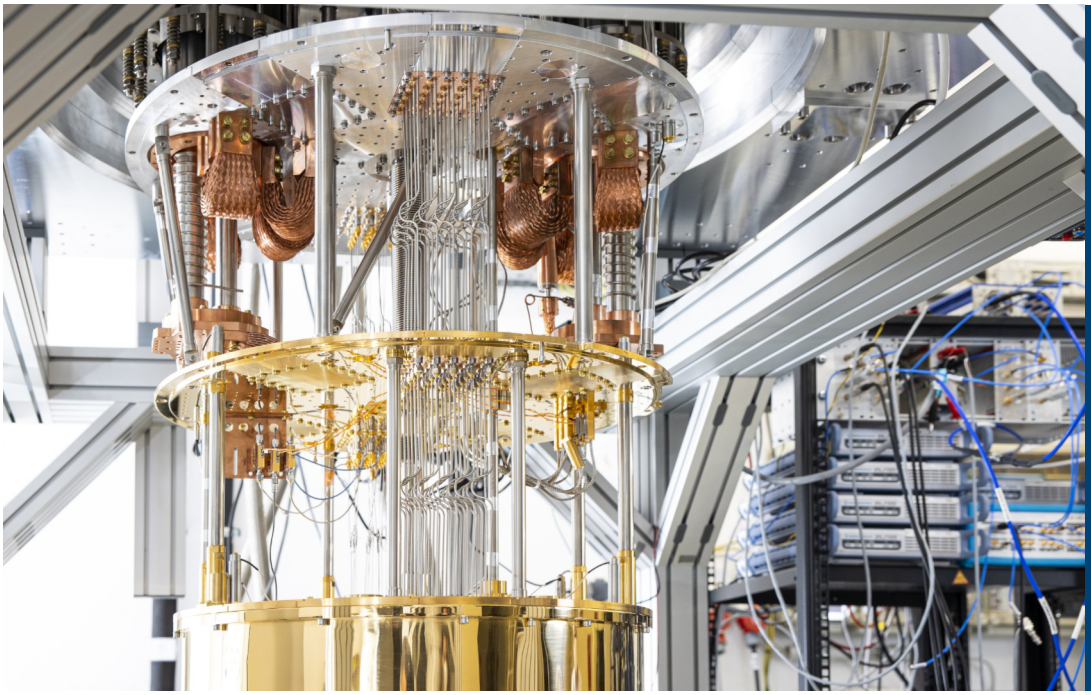

Conducting research for a changing society: This is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,400 employees in one of Europe's biggest research centres and help us to shape change!

The Peter Grünberg Institute - Quantum Nanoscience (PGI-3) is one of the world`s leading players in the field of quantum nanoscience research. Its overarching goal is the investigation and application of quantum-coherent functionality of nanostructures. Our research thus contributes to the foundations of new quantum technologies, in particular quantum sensor technology and quantum computing on the nanoscale. Our particular strength lies in the combination of state-of-the-art experimental research methods with comprehensive expertise in the development of unique scientific devices.

We are looking to recruit a

PhD Position in Atomic-Scale Quantum Sensing and Information

Your Job:

The research will be part of the recent ERC Starting Grant "Atomic Scale Quantum Sensing and Information with Molecular Nanostructures on a Scanning Probe Tip" (ERC-2024-StG, QuSINT). Our research focuses on the study of quantum magnetism at the atomic scale. We build artificial quantum architectures from single atoms and molecules on surfaces and on probe tips, control their spin states, and study qubit systems. A particular emphasis is on exploiting the manipulation capabilities of scanning probe microscopes to fabricate molecular quantum sensors on probe tips to detect the tiny electric and magnetic fields of quantum systems at the atomic level (Nature Nanotechnology 19, 1466 (2024)), e.g. in emerging quantum materials such as 2D materials.

The research is carried out in our newly established laboratory with two millikelvin scanning probe microscopes in ultra-high vacuum with adiabatic demagnetization refrigeration (Rev. Sci. Instrum. 92, 063701, (2021)). The millikelvin systems reach temperatures below 30 mK and allow the application of magnetic fields to the sample. We characterize the magnetic properties of the quantum systems using standard spectroscopic detection schemes and electron spin resonance.

Your tasks are among others:

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our **Online-Recruitment-System!**

Questions about the vacancy?

Get in touch with us by using **our contact form.**

Please note that for technical reasons we cannot accept applications via email.

www.fz-juelich.de

- Operation of a millikelvin scanning probe microscope
- Investigation of molecular and atomic spin/qubit systems on surfaces using spectroscopic techniques
- Fabrication and study of artificial nanostructures with purpose-engineered quantum states
- Development of novel quantum sensors at the atomic scale
- Publication of results in peer-reviewed scientific journals and presentation at conferences

Your Profile:

- Passionate and curiosity-driven candidates with an Master`s degree in Physics, Nanoscience, Chemistry, or related fields, with a strong background in solid state physics, quantum magnetism, surface science, and/or nanoscience
- Willingness and ability to think outside the box and work in a team in an international and diverse environment
- Experience and strong interest in experimental and laboratory work
- Experience with programming in Python
- Fluency in speaking and writing English
- Previous experience with scanning probe microscopy would be an advantage

Our Offer:

We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We offer ideal conditions for you to complete your doctoral degree:

- A highly motivated research group as well as an international and interdisciplinary working environment at one of Europe’s largest research establishments
- Outstanding scientific and technical infrastructure
- Opportunity to participate in (international) conferences and project meetings
- Continuous scientific mentoring by your scientific advisor
- 30 days of annual leave (depending on agreed working time arrangements) and provision for days off between public holidays and weekends (e.g. between Christmas and New Year)
- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work
- Further development of your personal strengths, e.g. through an extensive range of training courses; a structured program of continuing education and networking opportunities specifically for doctoral researchers via JuDocS, the Jülich Center for Doctoral Researchers and Supervisors: https://www.fz-juelich.de/en/judocs
- Targeted services for international employees, e.g. through our International Advisory Service

In addition to exciting tasks and a collaborative working atmosphere at Jülich, we have a lot more to offer: https://go.fzj.de/benefits

The position is initially for a fixed term of 3 years. Pay in line with 65% of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund) and additionally 60 % of a monthly salary as special payment („Christmas bonus“). The monthly salaries in euros can be found on page 66 of the PDF download: https://go.fzj.de/bmi.tvoed Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at: https://www.fz-juelich.de/gp/Careers_Docs

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A

diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.