



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

Postdoctoral Researcher 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

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

spectroscopic detection schemes and electron spin resonance.

Your tasks are among others:

- 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
- Supervision and mentoring of masters and doctoral students
- Publication of results in peer-reviewed scientific journals and presentation at conferences

Your Profile:

- Passionate and curiosity-driven candidate with an PhD degree in Physics, Nanoscience, Chemistry, or related fields, with a strong background in solid state physics, quantum magnetism, surface science, and/or nanoscience
- Experience with scanning probe microscopy and programming in Python
- Hands-on experience with ultra-high vacuum and cryogenic systems
- Strong analytical and problem-solving skills, creativity, and an independent, goal- and solution-oriented work attitude
- Previous experience with high frequency equipment and electron spin resonance would be advantageous

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 support you in your work with:

- 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
- Extensive company health management
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy
- A full-time position with flexible working hours
- 30 days of annual leave and provision for days off between public holidays and weekends (e.g. between Christmas and New Year)
- 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>

We offer you an exciting and varied role in an international and interdisciplinary working environment. The position is initially for a fixed term of 2 years. Salary and social benefits will conform to the provisions of the Collective Agreement for the Public Service (TVöD-Bund), pay groups 13 - 14, depending on the applicant's qualifications and the precise nature of the tasks assigned to them. All information about the Collective Agreement for the Public Service (TVöD-Bund) can be found on the BMI website: <https://go.fzj.de/bmi.tvod> . The monthly salaries in euros can be found on page 66 of the PDF download.

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.