Externe Stellenausschreibung

As a member of the Helmholtz Association, Forschungszentrum Jülich makes an effective contribution to solving major challenges facing society in the fields of information, energy, and bioeconomy. It focuses on varied tasks in the area of research management and utilizes large, often unique, scientific infrastructure. Come and work with around 6,100 colleagues across a range of topics and disciplines at one of Europe’s largest research centres.

We look forward to receiving your application until 22.03.2020 via our Online-Recruitment-System!

Questions about the vacancy?
Contact us by mentioning the reference number 2020D-026:
career@fz-juelich.de
Please note that for technical reasons we cannot accept applications via email.
www.fz-juelich.de

JARA-Institute for Quantum Information (PGI-11), member of the Peter Grünberg Institute, is focusing on theoretical and experimental development of large-scale quantum computing system. Yet, the institute is the member of the OpenSuperQ consortium (http://www.opensuperq.eu) with its main objective to design, build an operate a quantum information processing system based on superconducting quantum circuits reaching the scale of 100 qubits.

We are offering a

2020D-026 - PhD position - “Experimental superconducting quantum computing”

Your Job:
Superconducting cubits are considered today as the most real and feasible approaches to the development of multi-qubit quantum computer. Most of us have read news about “quantum supremacy” recently demonstrated by Google, where the successful demonstration was made with the system consisting of 53 transmon qubits. Physically, these transmons are just electrical non-linear circuit nanofabricated by utilizing very thin aluminium film, which becomes superconducting at temperatures below 1 Kelvin. In contrast to the other well known quantum information platforms such as spins in solids, quantum dots, nitrogen-vacancies in diamond and trapped ion, where the quantum information is encoded in natural microscopic degrees of freedom, superconducting qubits are macroscopic in size (~1mm), lithographically defined and offers a plenty of flexibilities in engineering of their properties. Our work initially aims at the setting up the millikelvin cryogenic system, development of microwave control and readout electronics, preparation of the measurement/data processing software and enabling the remote control of all instruments. We finally aim at the demonstration of the fully-functional, working and accessible multi-qubit quantum processing platform with the-state-the-art performance.
Yet, with a cooperation involving local research groups we plan to establish reliable fabrication of superconducting quantum circuits in FZ Jülich with the state-of-the-art performance in terms of coherence, gate fidelities and gate errors.

- Experimental investigation and implementation of quantum processing algorithms with superconducting multi-qubit platforms
- Development and characterisation of superconducting qubits. Investigations of the underlying decoherence processes
- Development of microwave quantum control/read-out systems
- Experimental data processing and their detailed analysis
- Development of python-software for the remote control of instruments
- Fabrication of superconducting quantum circuits and their characterisation and optimisation of the fabrication process
- Presentation, communication, and publication of cutting-edge research in the international community

**Your Profile:**

- Excellent University degree in quantum physics or electro engineering
- Deep knowledge in solid-state physics and/or quantum optics
- Team-oriented, reliable and highly motivated character
- Experimental experience at least in one of the fields: Cryogenics, Microwave, Quantum Information processing or Quantum optics
- Good written and oral communication skills in English

**Our Offer:**

- We offer a world-leading, international and interdisciplinary research environment, provided with the state-of-the-art experimental equipment and versatile opportunity for your professional growth as a serious researcher
- Tight connections to the world leading theory groups in the field of quantum information processing
- A highly motivated group with connections to the best research institutions across European Union and beyond
- Chance of participating in local and international conferences and project meetings
- Continuous, professional support by your scientific supervisor
- Pay according to Collective Agreement for the Public Service (75% of EG13 TVöD)
- Contract with duration of 3 years
- Information on employment as a PhD student at Forschungszentrum Jülich can be found here http://www.fz-juelich.de/gp/Careers_Docs

To apply, please submit a complete CV, motivation letter, university degree records (both Bachelor’s and Master’s degree), as well as two reference letters.

Forschungszentrum Jülich promotes equal opportunities and diversity in its employment relations.

We also welcome applications from disabled persons.