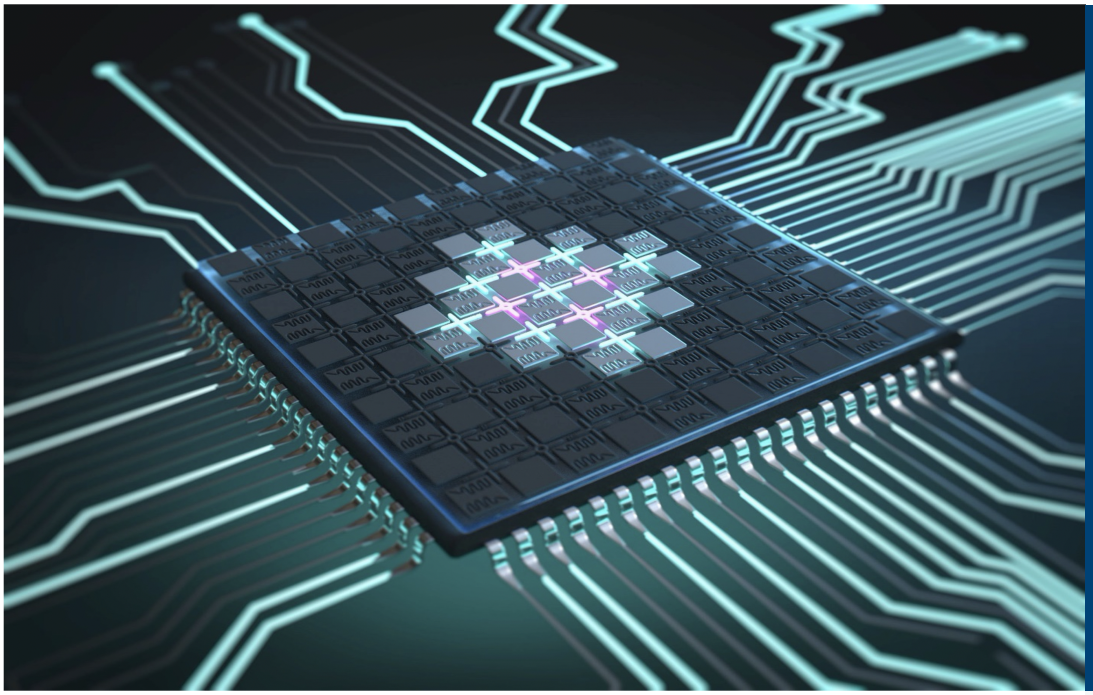
JÜLICH
Forschungszentrum



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!

Combine your scientific interest and technical skills in the field of electrical engineering to create new knowledge for the socially and scientifically relevant areas of information, energy and bioeconomy. We offer you all of this at the Central Institute of Engineering, Electronics and Analytics – Electronic Systems (ZEA-2) with modelling, designing and developing the most innovative system solutions for science and society.

We are looking to recruit a

PhD Position – System-level integrated circuit design and modeling for scalable quantum computing architectures

Your Job:
We are working on scalable electronic architectures based on semiconductor spin quantum bits (qubits) to make the vision of a universal quantum computer reality. For scaling up the number of qubits into the millions, it is crucial to move parts of the control electronics closer to the qubits. To achieve this, we design and implement cryogenic integrated circuits for qubit control and readout in state-of-the-art CMOS technologies. Since qubits are extremely sensitive and operate in temperatures at low millikelvin levels, the requirements on power consumption, noise and area are severe. For this reason, it is necessary to develop new and groundbreaking architectures and circuit topologies. Modeling electronics and their interfaces to qubits in this challenging environment is an essential part of this.

- Abstract behavioral modeling of mixed-signal and digital integrated circuits
- System-level integrated circuit design
- Combined simulation of electronics and existing quantum mechanical models of qubits

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

- Scalability analysis and comparison of different electronic architectures and integrated circuit topologies
- Formulating detailed specifications for scalable integrated circuits from combined electronics and quantum mechanical models

Your Profile:
- Scientific Master degree or comparable degree in electrical engineering, computer science, physics, or similar field
- Basic knowledge in (integrated) circuit design and computer architectures or system modeling
- Self-driven development of solutions
- Good communication skills and willingness to work in a diverse environment

The main focus of the position is on system-level circuit design and modeling, but it has a substantial connection to quantum physics and quantum computation. Please explain your motivation to apply for this interdisciplinary position.

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:
- Opportunity to work on highly relevant engineering challenges with state-of-the-art technologies
- Continuous scientific mentoring by your scientific advisor as well as a close integration in the international research group
- Publishing and presenting your work in (international) conferences and project meetings
- Acquiring skills, demanded equally by academia and high-tech companies worldwide
- Strengthening personal skills through an extensive range of internal training courses
- Networking opportunities specifically for doctoral researchers via JuDocS, the Jülich Center for Doctoral Researchers and Supervisors: https://www.fz-juelich.de/judocs
- Flexible working hours and the possibility to partially work from home
- Targeted services for international employees, e.g. through our International Advisory Service

The period of a PhD thesis in Jülich is initially planned for 3 years and paid in line with 70 % of the pay group E13 of the provisions of the Collective Agreement for the Civil Service (TVöD-Bund) and additionally 60 % of a monthly salary as special payment („Christmas bonus“). Further information on doctoral degrees at Forschungszentrum Jülich is available at: https://www.fz-juelich.de/gp/Careers_Docs

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 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.