The Peter Grünberg Institute for Quantum Control (PGI-8) at the Forschungszentrum Jülich specializes in novel optimization strategies for emerging quantum technologies. These emerging technologies aim to provide transformative changes to our society, including how we think about information, and unlocking vast calculations for the natural sciences, logistical problem solving, and high-performance computation. Our group has pioneered the application of quantum optimal control methods to quantum computation and many-body quantum systems. This includes the development of physical models and model reduction techniques as well as algorithmic advances of in-situ optimization and machine learning to tackle the complex processes inherent to scalable quantum devices.

The Peter Grünberg Institute for Quantum Control (PGI-8) is looking for a

**PhD Position - Optimal Control and Quantum Simulation**

**Your Job:**
- devise strategies to demonstrate quantum advantage in experimental quantum simulators
- develop techniques to simulate and control the dynamics for exponentially increasing quantum-systems sizes
- design and implement optimization techniques for controlling the dynamics of experimental quantum-technology platforms
- model and mitigate major sources of experimental error (as dissipation)
- cooperate with and support experimental partners working on, e.g., Rydberg atoms or ultra-cold atoms

**Your Profile:**
- Master degree in physics (or in a related subject)
- Background and strong interest in developing theoretical models and methods as well as in implementing numerical optimization techniques
- Interest in working closely with experimentalists
• Detailed knowledge of quantum physics and experience with quantum technology
• Strong mathematical education, in particular in relation to linear algebra
• Programming experience (e.g., Python or Julia)
• Ability to effectively communicate in written and spoken English
• Ability to work autonomously and in close interaction within a team
• Most importantly: enthusiasm to explore uncharted territory, develop, and follow your own ideas

Our Offer:
• Opportunity to conduct research at the interface of theory and experiment in a world-leading group in quantum control.
• Work in a highly motivated research group as part of an international and interdisciplinary working environment with access to outstanding computing facilities and connections to the best research institutions around the world.
• Continuous scientific mentoring by your scientific advisor as well as feedback and wide-ranging expertise from the whole group in multiple facets of quantum technology and optimization.
• Opportunity of participating in (international) conferences and project meetings
• Participation in overarching seminars including certificate
• The skills that you will acquire during your PhD are in high demand both in academia and in high-tech companies: at present, there is significant investment from private and governmental funding agencies in the field of quantum technologies
• Pay in line with 75 % of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund).
• Information on employment as a PhD student at Forschungszentrum Jülich can be found here http://www.fz-juelich.de/gp/Careers_Docs

Forschungszentrum Jülich promotes equal opportunities and diversity in its employment relations.
We also welcome applications from disabled persons.