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!

At the Institute of Climate and Energy Systems - Energy Systems Engineering (ICE-1) we focus on the development of models and algorithms for simulation and optimization of decentralized, integrated energy systems. Such systems are characterized by high shares of renewable energies and increasing sector coupling, which leads to high spatial and temporal variability of energy supply and demand as well as a high degree of interdependence of material and energy flows. Our research at the ICE-1 aims to provide scalable and faster-than-real-time capable methods and tools that enable the energy-optimal, cost-efficient and safe design and operation of future energy systems.

We are looking to recruit a

PhD position - Power system monitoring and quantum communication

Your Job:
Maintaining an efficient, sustainable, and stable energy supply requires integrating various technologies, which poses complex challenges for modern energy systems. In particular, given the limited observability of the energy systems, advanced monitoring solutions are needed to observe the behaviour of the entire system, in order to provide reliable data for system monitoring and control.

In this framework, Quantum key distribution (QKD), thanks to the cryptographic protocol, can play a key role in ensuring safe communication between the monitoring devices and the control room.

We are currently seeking a PhD student for the following research topics:

- Development of QKD-based solutions for innovative monitoring applications.
- Development of advanced estimation algorithms for the energy grid
- Data analysis considering uncertainties and related metrological aspects
- Real-time implementation and hardware-in-the-loop (HiL) validation of the proposed methods and tools
- Integration of the developed algorithms in real applications

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
Your Profile:
- Excellent university degree (Masters) in Electrical Engineering, Electronic Engineering, Physics or a comparable field
- Strong mathematical background
- Excellent knowledge and experience in programming (e.g. Python, Matlab, C, C++)
- Knowledge of statistical analysis for measurement data
- Knowledge on power system monitoring
- Interest in energy systems and communication infrastructures, especially regarding power grids
- Experience with real-time simulations is welcome
- Excellent ability for cooperative collaboration
- Very good communication skills in English
- Prior German knowledge is not strictly required, and it is possible to enroll in language courses organized by the research center

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:
- Possibility of pursuing a PhD at RWTH Aachen University supervised by Prof. Benigni
- A highly motivated research group in one of the biggest research centers in Europe
- An excellent scientific and technical infrastructure: both necessary conditions for a successful PhD thesis at RWTH Aachen within three and a half years
- Possibility of flexible working with a mix between home office and work in presence
- Participation in project meetings and conferences
- Strong support and mentoring for setting up a future career in science and/or the industry
- 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/judocs
- Targeted services for international employees, e.g. through our International Advisory Service

The position is for a fixed term of 3.5 years, where the first half year serves as orientation and probation period. Pay in line with 75% 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“). Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at: 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.