



Paderborn University is a high-performance and internationally oriented university with approximately 20,000 students. Within interdisciplinary teams, we undertake forward-looking research, design innovative teaching concepts and actively transfer knowledge into society. As an important research and cooperation partner, the university also shapes regional development strategies. We offer our more than 2,300 employees in research, teaching, technology and administration a lively, family-friendly, equal opportunity environment, a lean management structure and diverse opportunities.

Join us to invent the future!

The Faculty of Science, Department of Physics, Integrated Quantum Optics Group, offers the position of

Researcher/PhD student (f/m/d)

(pay scale 13 TV-L)

Applications are invited for a PhD position in the field of Integrated Quantum Optics starting from now on. The position (75% of regular working time) entails a fixed term contract for the duration of the PhD project and is initially limited to 3 years, depending on the previous qualification (according to the German law "Wissenschaftszeitvertragsgesetz").

Position Profile:

- Position within the QuantERA project "**Quantum information and communication with high-dimensional encodings**" (QuICHE).
- This project aims to realize high-dimensional quantum key distribution in multi-user photonic networks, where information is encoded in time and frequency.
- With strong support from our own group and project partners, the goal is to generate, verify and read out time-frequency qudits based on:
 - Experimentally developing a parametric down-conversion source for the controlled generation of high-dimensional (10-100 dimensions) time-frequency qudits.
 - Experimentally developing a multi-output quantum pulse gate for the simultaneous read out of 5-10 dimensions.
 - Implementing a lab demonstrator of a high-dimensional quantum key distribution system and demonstrating an increased performance when compared to two-dimensional encodings.
- The position will be integrated in a large, dynamic, and friendly international group, with expertise from device design and fabrication, to quantum photonics and networking.
- Active collaborations with leading partners from across Europe will give you the opportunity to extend your professional network.
- Participation in teaching is connected with the position.

Your Profile:

- Completed university degree in physics
- Experience in quantum optics and/or ultrafast physics
- Experience in experimental quantum key distribution
- Theoretical knowledge of modelling and simulation of physical systems
- Knowledge of data analysis and programming

Applications from women are particularly welcome and, in case of equal qualifications and experience, will receive preferential treatment according to state law (LGG). Qualified disabled people (in the sense of the German social law SGB IX) are also encouraged to apply.

Please send your application with **reference 4219** to:

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