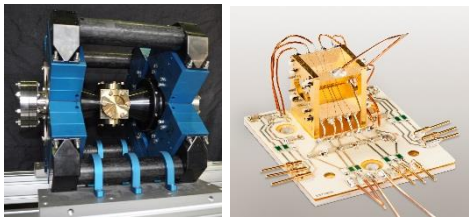
The Physikalisch-Technische Bundesanstalt (PTB) is the National Metrology Institute of the Federal Republic of Germany with scientific and technical service tasks. It furthers progress and reliability in metrology for society, the economy and science. The QUEST Institute for Experimental Quantum Metrology is a joint institution of Leibniz Universität Hannover and PTB Braunschweig. The research revolves around quantum logic techniques for spectroscopy, optical clocks, and tests of fundamental physics with trapped ions.

At the QUEST Institute, we are looking for a

Postdoctoral researcher in the field of quantum logic spectroscopy of highly charged ions (TVöD E13)

to join us as soon as possible.

Highly charged ions (HCIs) are ubiquitous in the observable universe and have many favourable properties for tests of fundamental physics and use as next-generation optical clocks. Recent breakthroughs in our group, working closely together with the Max-Planck-Institute for Nuclear Physics (MPIK Heidelberg), have enabled the first ever demonstration of optical clock-like spectroscopy on an HCI. This yielded a leap of nine orders of magnitude in precision over the previous state-of-the-art. We will now work towards taking full advantage of the system by demonstrating operation with several different ion species and targeting measurements at competitive levels of accuracy to the very best atomic clocks worldwide.



Left: electron beam ion trap, used for production of highly charged ions
Right: cryogenic linear ion trap, used to store cold ions for spectroscopy

The post is initially limited to three years; an extension of the contract is possible. You will be employed at our Braunschweig site. The remuneration will be paid in accordance with remuneration group 13 TVöD Bund.

We offer:

- An excellent research environment with access to PTB's unique infrastructure
- Hands-on training in modern experimental techniques of laser and quantum physics, and actively contribute to the development of experiments at the forefront of quantum physics research
- Possibility to present scientific results at international conferences
- We encourage research stays abroad with our international collaborators

Your tasks:

- Working with our team to install and characterise an upgraded ion trap based on precision-machined wafer technology to further improve the performance of the system
- Development of quantum algorithms to allow the rapid location and identification of narrow optical transitions in HCIs

Your profile:

- You have obtained an excellent university degree in physics
- You are interested in developing and realising precision experiments
- You are highly committed and capable of working both autonomously and together as part of a team, and you are willing to improve your skills
- You are a team player and have good communication skills
- You have a very good command of both spoken and written English
- Sound knowledge of atomic physics and experience in the field of quantum optics, laser cooling, laser spectroscopy or related subjects is advantageous
- You have the physical ability to work in a laboratory and to perform experiments outside the institute

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