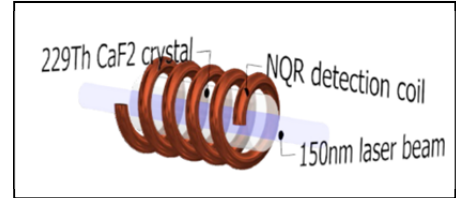


PhD position / research project

Nuclear quadrupole resonance spectroscopy for novel atomic clock

Duration: 3 years PhD (splitting 1 y in Graz – 2 y in Vienna) or 1 year without PhD option in Graz only

Description: The Institute of Medical Engineering (IMT), TU Graz and the Quantum metrology group at Atominstitut (AI), TU Wien cooperate in developing a new type of highly precise atomic clock based on a nuclear transition of the rare isotope ^{229}Th . The part at IMT consists of implementing a highly sensitive dedicated NMR pulse spectrometer for nuclear quadrupole resonance spectroscopy (NQRS) and experiments for detecting very weak RF interactions in weakly ^{235}U doped crystals. The second part at AI aims at integrating the optimized spectrometer into a cryo-environment for the ^{229}Th system and basic experiments in combination with optical pumping.



Your profile: We search for a person with an MSc degree, preferably in physics, electrical engineering, biomedical engineering or related curricula. We expect good knowledge in RF electronics, excellent programming skills in MATLAB and Python and good knowledge of NMR spectroscopy. Moreover this interdisciplinary project requires a high degree of cooperation, communication and independent self-organization.

Our offer: In the project (start September 2020) we are offering an attractive PhD position in a challenging and pioneering project, embedded in a national cooperation network of physicists, electrical engineers and biomedical engineers. The project provides excellent infrastructural conditions and a dynamic and inspiring scientific environment. Due to the cooperation we expect the candidate to spend the 1st year at IMT and the following 2 years at AI (Vienna).

Main tasks:

- Development of highly sensitive wideband cryo-probeheads for NQRS at 150 – 400 MHz;
- configuration and adaptation of a commercial NMR-spectrometer, including NMR-pulse sequence design;
- development of dedicated hardware interfaces and the required software for the communication with the NMR console;
- integration of the system into the experimental environment at AI in Vienna;
- design and execution of experiments involving samples of high-spin quadrupole nuclei;
- administrative tasks and activities for the communication and dissemination of the results

If your profile matches the described one please contact us, providing a motivation letter and your CV. Optionally the 1-years part at IMT can be split off for a technically skilled person who does not wish to continue working at AI. However, in this case the contract ends after 1 year.

Contact person:

ao. Univ. Prof. DI Dr. Hermann Scharfetter
Institute of Medical Engineering, Graz University of Technology
Stremayrgasse 16/III
A-8010 Graz, Austria
Tel: ++43 (0)664 60 873 7394
e-mail: hermann.scharfetter@tugraz.at