



Deutsches Zentrum
für Luft- und Raumfahrt

Job Description: PhD position

Quantum Density Functional Theory

Physics or related field (m/f/d)

Start date:

September 1, 2023 or later

Duration:

3 years

Compensation:

Up to pay grade 13 TVöD

Employment:

part-time



Your mission:

The Institute of Materials Physics in Space is one of the leading institutes worldwide in the exploration of fundamental physical properties and the solidification of metallic liquids, soft matter, and granular systems. In addition to experimental work in the laboratory and in microgravity, the institute works on computer simulations and theory to understand the physical phenomena that occur.

The Quantum Computer Initiative is a major project of the German Aerospace Center in the development and use of quantum computers. In the field of materials physics, the initiative aims to lay the foundations for the future effective use of quantum hardware and corresponding algorithms.

Density Functional Theory (DFT) is a method used widely in statistical physics as well as materials science. It has been refined with different levels of approximations and is by now a standard tool to determine material properties and dynamics (DDFT). The goal of the present project is to extend DFT into the realm of quantum calculations in order to discover novel phenomena and establish algorithms optimized for quantum hardware.

As a part of this project, you will be responsible for the following tasks:

- Analytical calculations to amend and expand DFT for the specific problems in the quantum realm
- Development of quantum computer algorithms and coordination with currently and future available hardware solutions
- Publication of results in scientific journals and presentations at international scientific conferences

The dissertation work shall be performed at DLR in Cologne in collaboration with the Heinrich Heine University of Düsseldorf.

Your qualifications:

- Degree in physics, chemistry, computer science, mathematics, or biology
- Good programming skills, preferably in C++ and Python or similar languages
- Good English language skills
- Research experience in the field of density functional theory or quantum computing

Your start:

Look forward to an employer who values your commitment and promotes your development through diverse qualification and further training opportunities. Our unique working environment offers you creative freedom and an unparalleled infrastructure in which you can achieve your mission. Work-life balance, family and career compatibility, as well as equal opportunities for people of all genders (m/f/d), are important components of our personnel policy. We give preference to applications from qualified disabled individuals.

Contact Person:

Prof. Dr. Matthias Sperl, matthias.sperl@dlr.de

Reference number: 85302

Online Application Form:

<https://www.dlr.de/dlr/jobs/en/desktopdefault.aspx/yyyy/>