



Deutsches Zentrum
für Luft- und Raumfahrt

Job Description: PhD position

Quantum Mode-Coupling 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.

Mode-coupling theory (MCT) is an established tool in classical condensed matter theory, especially for the calculation of glassy states and dynamics. The goal of the present project is the extension of the theory towards quantum phenomena. Quantum glass states are expected to be valuable for both the development of novel materials as well as the design of more effective optimization schemes.

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

- Analytical and numerical calculations to extend liquid state theory as well as MCT into the quantum regime
- Development of quantum computer algorithms suitable for condensed matter problems
- Publication of results in scientific journals and presentations at international scientific conferences

Your qualifications:

- Degree in physics, chemistry, computer science, mathematics, or biology
- Good analytical and programming skills
- Good English language skills
- Preferably research experience in the field of condensed matter theory

The dissertation work shall be performed in Cologne with a collaboration with the University of Constance.

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: 85260

Online Application Form:

https://www.dlr.de/dlr/jobs/en/desktopdefault.aspx/tabid-10596/1003_read-51659/