

## PhD Student Position (f/m/d): Granular Sound Characterization in Microgravity

Granular Matter Group | Institute for Theoretical Physics

We are one of the largest and oldest universities in Europe and one of the most important employers in our region. Our broad range of subjects, the dynamic development of our main research areas and our central location in Cologne make us attractive for students and researchers from around the world. We offer a wide range of career opportunities in science, technology, and administration.

The Granular Matter Group investigates the microscopic mechanisms that determine the collective mechanical properties of large particulate systems. We study transitions between granular solid-/fluid-/gas-like states. In a current experiment on the International Space Station (ISS), sound waves are used to probe the continuum limit of bead packing ensembles under fluctuating contact-forces and topologies.

### YOUR TASKS

- » Data analysis of an ongoing ISS experiment
- » Ground reference measurements and refinement of parameters for new runs of the ISS experiment
- » Laboratory experiments in cooperation with DLR Cologne
- » Combining results of ISS and ground data with externally provided material calibration data to obtain empirical laws
- » Theoretical analysis based on Effective Medium Theory
- » Identifying and testing relevant mechanisms on different length scales: nonlinear force-laws, force-chain topology, distribution of force fluctuations, crystalline domains
- » Exploring extensions of current theories for disordered granular matter

### YOUR PROFILE

- » Physics Master or equivalent
- » Previous experience of working in physics labs with electronic equipment (microcontrollers, oscilloscopes, etc)
- » Programming languages: C, C++, git
- » Experience with Linux is beneficial
- » Fluent in English, possibly German
- » Capable of working in international, multidisciplinary teams
- » Resilient and adaptive to high levels of stress and workloads

### WE OFFER

- » An opportunity to participate in microgravity research on ISS
- » A diverse working environment with equal opportunities
- » support in balancing work and family life
- » extensive advanced training opportunities
- » occupational health management offers
- » flexible working time models
- » opportunity to work remotely

The University of Cologne is committed to equal opportunities and diversity. Women are especially encouraged to apply and will be considered preferentially in accordance with the Gender Equality Act of the State of North Rhine-Westphalia (LGG NRW). We also expressly welcome people with disabilities/special needs or of equal status.

The position is available as soon as possible on a part-time basis (29,87 hours per week). It is limited for 3 years. If the applicant meets the relevant wage requirements and personal qualifications, the salary is based on remuneration group 13 TV-L of the pay scale for the German public sector.

Please apply online with proof of the required qualifications without photo under: <https://jobportal.uni-koeln.de>. The reference number is Wiss2304-01. The application deadline is 31.05.2023.

For further inquiries, please contact Prof. Dr. Matthias Sperrl ([matthias.sperl@uni-koeln.de](mailto:matthias.sperl@uni-koeln.de)).