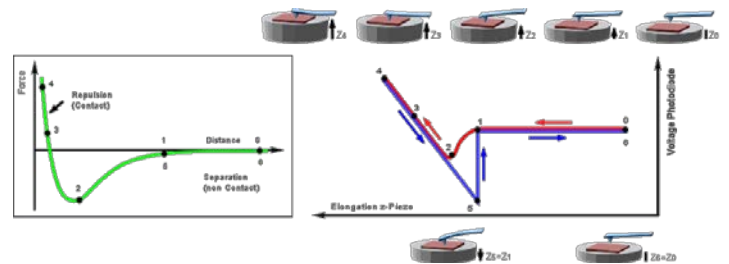




B.Sc.-/ M.Sc. Thesis “Jump To Contact” Suppression for Force Spectroscopy Measurements inside the SEM

We have a problem:

One common way to measure surface forces on the small scale (typically few nanometer) is to slowly bring a cantilever spring in contact with the sample and measure the deflection of the cantilever (e.g. using an atomic force microscope). Using Hook's law and knowing the spring constant of the cantilever, the force acting on it can be calculated. A common problem during such measurements is the jump to contact where the force gradient exceeds the spring constant of the cantilever and it suddenly snaps onto the surface. Here, the information about the complex interplay of different surface force components (van der Waals forces, electrostatic forces, capillary interactions, etc.) is lost. Our goal is to make this information accessible by implementing a control routine, which applies counterforce to compensate for the force gradient between cantilever and surface into a dedicated surface force measurement setup in the vacuum environment of a scanning electron microscope.



<https://physik.uni-greifswald.de/en/research-groups/soft-matter-and-biophysics-prof-christiane-helm/methods/afm-atomic-force-microscope/>

We offer:

- An interesting topic, related to nanotechnology, surface science and engineering
- A multidisciplinary team of experienced researchers
- State-of-the-art equipment
- long-term perspectives for excellent students

Last but not least: We have an outstanding coffee machine... ☺

We are looking for:

... excellent students of “computing science”, “physics” or “engineering physics” searching for an interesting subject for their bachelor or master thesis. We expect interest in surface science and solid-state physics as well as the willingness and motivation to experimentally work on a challenging topic, and experience in control engineering.

University of Oldenburg, Department of Computing Science, Division Microrobotics and Control Engineering

www.uni-oldenburg.de/amir

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