Universität Basel

Departement
Physik

The Swiss Nanoscience Institute (SNI) at the University of Basel is a center of excellence for nanosciences and nanotechnology. It emerged from the National Center of Competence in Research (NCCR) Nanoscale Science and was founded in 2006 by the University of Basel and the Swiss Canton Aargau in order to support research, education, and technology transfer in the nanosciences and in nanotechnology in Northwestern Switzerland.
In the Nanolino Lab we perform various atomic scale experiments, namely controlled self-assembly of materials with atomic precision and we study the unique materials' properties by means of various scanning probe and spectroscopic techniques.
In a project titled ***Nanoscale mechanical energy dissipation in quantum systems and 2D-materials*** funded by the Swiss National Science Foundation we will study atomic scale energy dissipation phenomena.

For these research activities we are looking for a:

PhD student position in scanning probe microscopy

Short description of the project:

Understanding nanoscale energy dissipation is nowadays among few priorities particularly in solid state systems. Breakdown of topological protection, loss of quantum information and disorder–assisted hot electrons scattering in graphene are just few examples of systems, where the presence of energy dissipation has a great impact on the studied object. It is therefore critical to know, how and where energy leaks. Within the project we will perform energy dissipation measurements on graphene flakes and other 2D materials, namely $NbSe_2$, TaS_2 and Bi_2Te_3. High sensitivity pendulum geometry Atomic Force Microscope (AFM), oscillating like a pendulum over the surface, is perfectly suited to measure tiny amount of dissipation. The tip position on the sample is controlled with atomic accuracy owing to a tunneling current line and the enhanced sensitivity allows to distinguish between electronic, phononic or van der Waals types of dissipation. Measurements can be performed in a wide range of temperatures from 5K to room temperature and in magnetic fields spanning from B=0T to B=7T. The design of the sample holder allows to perform dissipation measurements while passing electric current in the plane of the sample surface.

Your profile:

We seek for a highly motivated person who enjoys working in a team of scientists with different backgrounds. A master degree in physics or a related field is expected and an experience in scanning probe techniques and knowledge of ultra high vacuum is of advantage.

Further Information / Contact:

dr Marcin Kisiel, tel: +41 (0)61 207 3725, marcin.kisiel@unibas.ch
https://nanolino.unibas.ch

Please submit your application online under: phd.nanoscience.ch
Project: P1803 – Nanoscale mechanical energy dissipation in quantum and 2D-materials
Deadline: 31 December 2018