The surface science group at the Institute of Experimental Physics is offering a

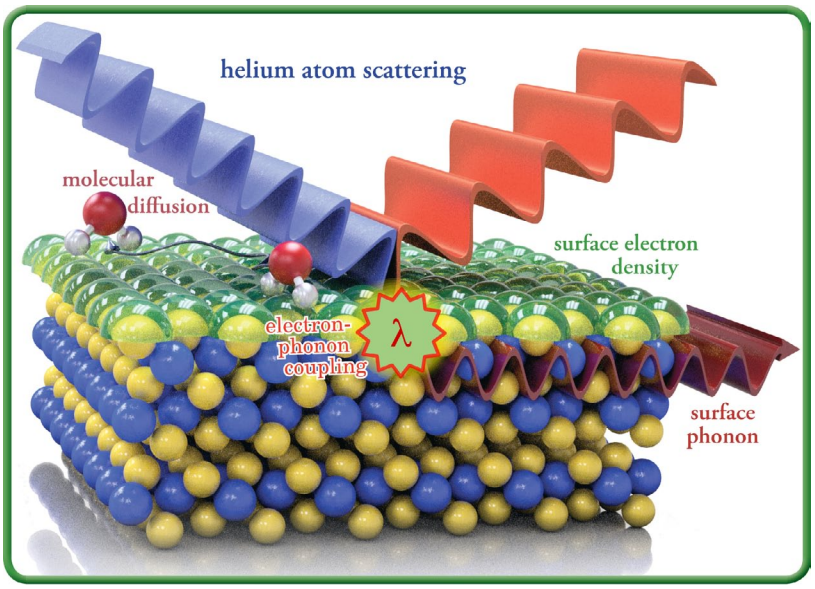
PhD position for studies of Dirac & 2D materials

Project description: We seek to obtain a deeper understanding of how energy dissipates on Dirac and two-dimensional materials. The discovery of Dirac materials (graphene, topological insulators and an entire class of 2D materials) is so recent that many fundamental questions are still wide open, with a strong potential for groundbreaking discoveries.

The first aspect of the project concentrates on how energy dissipates on these novel material surfaces, and the role of the electron-phonon (e-ph) coupling. The e-ph interaction at surfaces is one of the most important mechanisms for energy dissipation in electronic transport and its understanding is therefore of huge importance for future low-power technologies. It is also at the heart of conventional superconductivity.

As a second aspect, the project aims to quantify the role of energy dissipation in the motion and dynamics of molecules at surfaces. A central question for this motion is, in what way the molecule dissipates energy to the surface during its motion, which further governs the type of molecular motion and how fast and far the molecule may travel. Following the motion of individual molecules at surfaces is deceptively difficult and will be carried out at the Cambridge atom scattering centre.

As the successful candidate, you will perform helium atom scattering measurements of Dirac and 2D material surfaces. You will learn about reciprocal space techniques and in-depth data analysis. In addition, you will have the opportunity to perform He spin-echo measurements during a research stay at the University of Cambridge. Further complementary information can be obtained in collaboration with the photoemission electron microscopy (PEEM) group at TU Graz.



Qualifications and experience:

- Completed academic degree in physics, chemistry or materials science
- Experience in one of the following fields:
  - Condensed matter & surface-/nanoscience
  - Ultrahigh vacuum technology
  - Scattering & reciprocal space techniques

is advantageous, as well as basic programming skills (in Matlab and/or Python). You should further be used to independent problem solving with organisational skills as well as written and oral communication skills.

Our offer: The position is funded as part of an FWF (Austrian science fund) project, available from 15th July 2022 or later and will be limited to 3 years. Payment is based on the standard FWF salaries with 30 hours/week at € 2,300.30 gross per month (14 times a year).

- further education, training & mentoring
- flexible working hours
- public transport subsidy
- university sports program
- family friendly employer

Application: Please send your application by June 30th 2022 to Dr. A. Tamtögl (tamtoegl@tugraz.at). Further information on our research group is available at https://www.tugraz.at/en/institutes/iep/research/surfaces/.

Graz University of Technology promotes gender equality and aims at increasing the fraction of women in science. Applications from qualified women are explicitly encouraged. Applications from disabled persons with essentially the same qualifications will be given preference.

The Institute of Experimental Physics offers an excellent research environment with world class facilities, see: https://www.tugraz.at/en/institutes/iep/research/overview/. In addition to undertaking cutting edge research, Graz University of Technology offers supplementary qualification / courses for their students in order to develop the student's skills, networks and career prospects.