

PhD Position (66% TV-L E13) to Set up a Low Temperature STM for High Resolution Investigations of Metal Clusters

The group for Functional Nanomaterials at the Technical University of Munich investigates chemical and structural dynamics of functional surfaces such as small oxide-supported metal clusters with state-of-the-art microscopy and spectroscopy surface science techniques. We offer a stimulating research environment in a multidisciplinary laboratory in one of the highest-ranked universities in Europe. This PhD position is aimed at setting up a state-of-the-art low temperature scanning tunneling microscope (LT-STM) with cluster deposition source and reactivity setup, for high resolution investigations of supported metal clusters.

Project Description

Do you enjoy technical challenges just as much as scientific ones? Are you keen on building highly sophisticated instruments with your own hands and fiddling with electronics? Do you dream of performing cutting edge nanoscience experiments with equipment set up by yourself? Then this PhD position may just be right for you. We have recently received a high resolution LT-STM including pulsed reactivity and cluster deposition facilities. As the successful candidate you will assemble the apparatus, build up the required infrastructure in our lab, calibrate the experiments and perform first high resolution imaging and reactivity measurements of supported size-selected clusters.

Such supported clusters (i.e. particles with fewer than 100 atoms) exhibit attractive properties for industrial catalysis which can change even with the addition of a single atom. With this LT-STM, investigations at cryogenic temperatures will be performed to investigate the structures of different cluster isomers with the same number of atoms, to follow fast dynamics of weakly bound clusters, and to study the interaction of metal clusters with adsorbate molecules. You will prepare samples in situ via sputtering, annealing and metal atom and/or cluster deposition, perform high resolution STM measurements at variable temperatures and correlate structural properties with reactivity.

Required qualifications

Prospective candidates have a degree in physics, chemical engineering, chemistry or a related field and are highly motivated to work on sophisticated physicochemical experimental setups. They show a strong interest in method development and solving technical challenges and bring along good communication skills in English. The successful candidate will further show a willingness to learn about new techniques and scientific fields and contribute their own ideas to the project. We are looking for a team player who collaborates closely with other team members while also working independently on their own project. Experience in ultrahigh vacuum technology, STM, surface science and programming skills (Matlab, Python, LabVIEW, ...) is advantageous.

Our offer

The position is fully funded, available immediately and will be limited to three years. Payment will be based on the Collective Agreement for the Civil Service of the Länder (TV-L). TUM strives to raise the proportion of women in its workforce and explicitly encourages applications from qualified women. Applications from disabled persons with essentially the same qualifications will be given preference.

Application

Please send your CV, letter of motivation (max. 1 page) and two letters of reference to Prof. Dr. Barbara A. J. Lechner (recruitment.lechner@tum.de). Only complete applications will receive full consideration. The position is open until 31/10/2022 or until filled. Further information on our research group is available at www.ch.nat.tum.de/nanomaterials.