The Chair of Physical Chemistry of the Technical University of Munich investigates fundamental processes in energy conversion and sustainable cluster catalysis. We offer a stimulating research environment in a multidisciplinary laboratory in one of the highest-ranked universities in Europe. For our project, we advertise

1 PhD Position (66% TV-L E13)
in the field of Physical Chemistry or Experimental Physics

Project Description
Size-dependent structural and electronic effects make sub-nm clusters extremely interesting for highly selective, mild, sustainable catalytic and energy conversion processes. We investigate model systems of clusters, produced with atomic size selection, in reactive gas environments and use a sophisticated scanning tunneling microscope (STM). With its custom-built fast electronics, we can observe cluster catalysts in action by video-rate movies, by tracking diffusing particles, and by high-speed characterization of structural and adsorbate fluctuations. This gives unique access to the elusive dynamics of clusters and their life cycle under reducing, oxidizing, and wet conditions as well as in reaction atmospheres, and how these intrinsically metastable particles can be stabilized against or redispersed after sintering. Furthermore, cluster reactivity is investigated with our recently developed pulsed in situ reactor (“Sniffer”) and the chemical state by x-ray photoelectron spectroscopy (XPS).

As the successful candidate, you will benefit from membership at the TUM Graduate School and an active international scientific network within the Cluster of Excellence e-conversion and a DFG Collaborative Research Center. You will participate in meetings with our international collaborators, present your results at national and international conferences, and take part in exchange programs for PhD students.

Required qualifications
Prospective candidates have a degree in physics, chemistry, or a related field and are highly motivated to work on sophisticated ultra-high vacuum (UHV) experimental setups. Preference is given to candidates who have experience in operating vacuum or other surface science setups. We are looking for a highly autonomous scientist who is at the same time a good team player and collaborates closely with other group members. The successful candidate should enjoy solving technical challenges, bring along good communication skills in English, and show a willingness to explore new scientific fields and contribute their own ideas to the project. Experience in basic programming skills is advantageous.

Our offer
The positions are available immediately for the duration of three years. Payment will be based on the Collective Agreement for the Civil Service of the Länder (66% TV-L E13). TUM strives to raise the proportion of women in its workforce and explicitly encourages applications from qualified women. The position is suitable for severely disabled persons. Severely disabled applicants will be given preference if their suitability, qualifications, and professional performance are otherwise essentially equal.

Application
Please send your CV, a letter of motivation (max. 1 page), and two references to PD. Dr. Friedrich Esch (recruitment.pc@ch.tum.de). Only complete applications will receive full consideration. The position is open until 15.01.2024 or until filled. Further information on our research group is available at www.ch.nat.tum.de/pc. When applying you submit personal information. With your submission you confirm that you have acknowledged the data protection information of TUM.