

The Spectroscopy team at the Chair of Physical Chemistry of the Technical University of Munich focuses on chiroptical spectroscopy in the gas and liquid phases, and at solid surfaces. We specifically aim to understand the phenomenon of chirality transfer at a fundamental level. For our team we are offering a

Post-doc Position (TV-L E13) for linear and nonlinear chiroptical spectroscopy - chirality transfer

Project Description

In this project the transfer of chirality from a chiral host system into an achiral guest will be studied by linear and non-linear spectroscopic techniques that have been developed in our lab such as circular dichroism second harmonic generation, CD-SHG, spectroscopy and circular dichroism resonance enhanced multi-photon ionization, CD-REMPI, on both solid and fluid samples.

We will start from relatively defined systems such as: molecular complexes in the gas phase, chiral-achiral mixtures in the liquid phase and gels, and nanoparticles at surfaces. This will allow us to better understand the phenomenon of chirality transfer before applying it to more complicated systems such as size-selected supported metal clusters. The practical goal of this project is to demonstrate and understand the chirality transfer into catalytically relevant metal clusters, as they appear to be promising candidates to perform as asymmetric catalysts. These systems are highly sought after, since, lacking the natural handedness of nature in our labs, we rely on asymmetric catalysis in order to introduce chirality. Asymmetric catalysis is mainly performed homogeneously, however, the step from the lab-based demonstration to the industrial scale is hindered. Thus, heterogeneous asymmetric catalysis (HeAC) comes in. The goal of this project is to tackle the challenges in studying HeAC with the focus on novel spectroscopic methods.

Required qualifications

Prospective candidates must have a PhD in physical chemistry or physics or a related field and a background in laser spectroscopy. Experience in ultra high vacuum technology, UHV, cluster science, or chirality, while not necessary, will be considered as an advantage. The successful candidate is expected to: perform experiments, solve technical challenges and have good communication skills in English. The candidate further shows willingness to learn about new techniques and contribute their own ideas to the project. We are looking for a team player who collaborates closely with other members while also working independently.

Our offer

The position is fully funded, available immediately and for a duration of at least two years. Payment will be based on the Collective Agreement for the Civil Service of the Länder (TV-L; 100%, E13). 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 contact details of two potential references to Dr. Aras Kartouzian (aras.kartouzian@mytum.de) by 30.09.2022. Further information on our research group is available at:

<https://www.ch.nat.tum.de/pc/research/gasphase-spectroscopy/>
and
<https://www.ch.nat.tum.de/pc/research/surface-spectroscopy/>