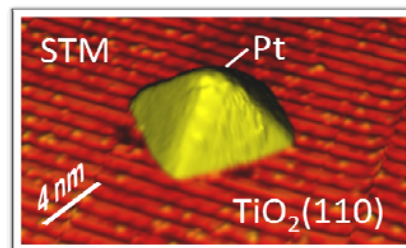


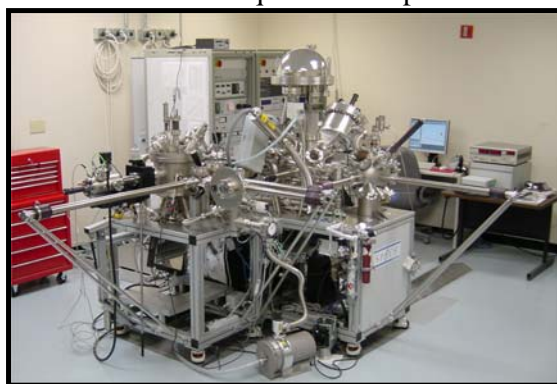
**PhD Position: Nanoscale Surface Physics:
Structural, Electronic, and Catalytic Properties
of Nanostructures**

PROF. DR. BEATRIZ ROLDAN CUENYA
Phone: +49 (0)234 32-23649
Fax: +49 (0)234 32-14173
beatriz.roldan@rub.de
www.ep4.rub.de/Roldan

There are several open PhD position for students interested in the research fields of surface physics and nanocatalysis in the Institute of Experimental Physics IV at the Ruhr Universität Bochum. The successful applicants will utilize ultrahigh vacuum (UHV) surface-sensitive techniques to characterize the novel size- and shape-dependent physical-chemical properties of nanostructures. Emphasis will be given to understanding the mechanisms of metal nanoparticle enhanced chemical reactivity by monitoring changes in size, shape, chemical state, and electronic structure of nanoscale systems during heterogeneous and electrochemical catalytic reactions. The reactivity tests will be conducted in UHV and at high pressure (gas/solid nanostructured interfaces), as well in an electrochemical environment (liquid/solid interfaces). The evolution of the structure, chemical state and composition of nanocatalysts at work (*in situ* and under *operando* conditions) will be monitored.



State-of-the-art experimental techniques are available in Dr. Roldán's laboratory for these projects: Atomic Force Microscopy (AFM), Scanning Tunneling Microscopy (STM), Scanning Electron Microscopy (SEM), X-ray Photoelectron Spectroscopy (XPS), Auger Electron Spectroscopy (AES), Ultraviolet Photoelectron Spectroscopy (UPS), Temperature-Programmed Desorption (TPD) and Reaction (TPR) with mass spectrometry and gas chromatography, Low Energy Electron Diffraction (LEED), and Molecular Beam Epitaxy (MBE). Furthermore, the selected students will also have access to synchrotron based measurement techniques at European and international facilities, including X-ray absorption fine-structure spectroscopy (XAFS), grazing incidence small angle X-ray scattering (GISAXS), as well as ambient pressure XPS. Required qualifications include a Master or BS in Physics, Physical Chemistry, Chemical Engineering, or Materials Science. Previous experience using any of the UHV surface analysis equipment mentioned above as well as synchrotron experience is not required, but would be of benefit.



Interested applicants should send their curriculum vitae and the names and contact information for three references by email as PDFs to: **beatriz.roldan@rub.de**