



TECHNISCHE  
UNIVERSITÄT  
WIEN

Vienna University of Technology



PhD Position in physics at the Vienna University of Technology:

### **X-ray Photoelectron Spectroscopy Data Analysis using a Neural Network**

The TU Vienna is inviting applications for a vacant PhD position in physics within the European Marie Skłodowska-Curie Innovative Training Network **EUSpecsLab**, <https://euspeclab.cnrs.fr/>. **EUSpecLab** aims to develop an algorithm based on a neural network to improve data analysis of X-ray photoelectron spectroscopy data for chemical surface analysis. The neural network will be used to improve data quality and do element and compound classification. For the element and compound classification we plan to use the NIST database SESSA (Simulation of Electron Spectra for Surface Analysis) to generate artificial XPS data for training the neural network. The +30.000 experimental XPS at NIST as well as new data taken at TUW, PSI, and SCIENTA will be used for test purposes. The specific objectives are:

- Installing and developing a neural network for spectral data analysis and generating test data using SESSA
- Training of the neural network and testing of neural network with experimental data taken at the TUVienna as well as available databases.

The candidate should have a strong background in physics or comparable and skills and experience in operating i.a. Linux-systems using The C/C++-programming language. Knowledge of machine learning/neuronal networks or similar represents an advantage. Experience in experimental physics, in particular working with ultra high vacuum equipment is desired albeit not a prerequisite. The work will be carried out in the group Applied and Computational Physics at the TU Vienna under the supervision of Prof. Wolfgang Werner.

We offer the candidate a three-year PhD-position in a small team at the host institution with excellent infrastructure, both from a computational as well as experimental point of view. Successful candidates will intensively interact with other members of the research consortium, in particular during network meetings and secondments, which are planned at the company SCIENTA, as well as the University of Uppsala and at the Swiss Light Source. She/he will receive a salary in accordance with the EU-regulations for PhD positions (3678.8€/month) and an additional monthly mobility allowance (600€tax-free). In addition, the EU provides funds for training and expenses for travel in connection with network meetings, secondments and participation in international conferences.

Details about the **EUSpecLab** network as well as the application procedure are given on the **EUSpecLab** homepage (<https://euspeclab.cnrs.fr/>)