University of Antwerp

The EMAT research group at the Faculty of Science (University of Antwerp) is seeking to fill a

PhD position in the area of precise structure characterisation using fast pixelated detectors for scanning transmission electron microscopy under the supervision of Prof Sandra Van Aert

The vacancy is situated in an H2020 ERC Consolidator grant Picometer metrology for light-element nanostructures: making every electron count (PICOMETRICS). The overarching goal of PICOMETRICS is to usher transmission electron microscopy in a new era of non-destructive picometer metrology. Novel data-driven methods will be combined with the latest experimental capabilities to study nanostructures from single low-dose recordings using fast pixelated detectors for scanning transmission electron microscopy (STEM). The required electron dose is envisaged to be four orders of magnitude lower than what is nowadays used. In this manner, beam damage will be drastically reduced or even be ruled out completely. This will enable precise characterisation of nanostructures in their native state; a prerequisite for understanding their properties.

Job description

- Depending on your interest, the successful candidate will work on (i) the design and optimization of experiments with a focus on how to reduce the required electron dose, (ii) deep learning in 4D STEM using neural networks and maximum likelihood estimation for precise positioning of atoms in 3D, (iii) chemical and oxidation state mapping or (iv) 3D structure analysis from time series data to track changes over time;
- You prepare a doctoral thesis in the field of sciences;
- You publish scientific articles related to the research project of the assignment;
- You present your work at national and international workshops and conferences.

Profile and requirements

- You hold a master degree with background in e.g. physics, mathematics, materials science, transmission electron microscopy, scientific computing or artificial intelligence;
- You are enthusiastic and greatly interested in the quantitative analysis of electron microscopy data;
- You can submit outstanding academic results;
- You are highly motivated, quality-oriented, conscientious, creative and cooperative.

We offer

- a doctoral scholarship for a period of 1 year, renewable for 3 years after positive evaluation;
- an exciting project in which we will aim to go significantly beyond the state-of-the-art;
- a competitive salary;
- the position will be filled as soon as possible, but the starting date can be adapted to the selected candidate's availability;
- a world-class, dynamic and stimulating work environment with state-of-the-art instrumentation and computing facilities (see also http://emat.uantwerpen.be/).

How to apply

You can submit your motivation letter, CV, summary of your Master thesis, a list and grades of the courses that you took during your studies, and names of 2 professional referees as one single PDF file uploaded on the Application Submission page at
http://nano.uantwerpen.be/jobs/submission/

Additional information about the vacancy can be obtained from: Sandra Van Aert, tel. +32 3 265 3252, sandra.vanaert@uantwerpen.be