# Postdoctoral scholarship in transmission electron microscopy

The Department of Chemistry, with more than 200 employees, is one of the largest departments at Stockholm University. The Research spans all areas of chemistry such as analytical chemistry, physical chemistry, materials chemistry, inorganic and structural chemistry and organic chemistry. The research projects are many from theory to experiment, from basic research to more applied projects often focusing on sustainable chemistry but also advanced analytical methods of chemicals and materials. The department has a very well-developed research infrastructure with state-of-the-art equipment with qualified support from staff scientists.

The department also hosts the Bachelor's degree programme in chemistry and three Master's programmes: analytical chemistry, sustainable chemistry, and organic chemistry. PhD programmes are conducted in five areas: analytical chemistry, physical chemistry, materials chemistry, inorganic chemistry and organic chemistry.
More information about us, please visit: https://www.su.se/english/divisions/department-of-chemistry

## Project description

Electron microscopy and electron diffraction offer powerful tools for advanced structural characterization. Aberration correction enables imaging with true atomic resolution, three-dimensional electron diffraction (3D ED) has extended the atomic structure determination into the nanoscale regime, and cryo-EM was acknowledged with the 2017 Nobel Prize in Chemistry. In recent years, techniques for four-dimensional scanning transmission electron microscopy (4D-STEM) have evolved rapidly, providing unique opportunities for the development of materials characterization with improved resolution.

This project focuses on developing methods for scanning electron diffraction (SED) applied to soft and beam-sensitive material systems, such as biopolymer composite materials. Biopolymers play an important role in the construction of biological materials, where they contribute to mechanical and other physical properties. SED provides a unique capability to study such organizations in biobased composite materials with nanoscale resolution.

In this project, we will utilize emerging opportunities for the rapid collection of electron diffraction data using transmission electron microscopy, such as 4D-STEM and SED, enabling structural investigation of highly electron beam-sensitive specimens. The project involves developing methods for studies of biopolymer-based specimens, including techniques for 3D reconstruction of SED data[1], with the aim of revealing their hierarchical organization.

We are looking for an ambitious, curious and self-motivated candidate. The work will be conducted in close collaboration with leading groups internationally and hence a successful candidate should have good collaborative skills. The candidate should have a PhD degree in Chemistry, Biology, Physics or similar subjects. Knowledge in any of the areas of electron

microscopy, crystallography, scattering techniques, biomacromolecules and/or scientific programming will be an asset, but is not necessary.

Group webpage: www.willhammargroup.com

[1.] Chiral Hierarchies at the Nanoscale Revealed by Three-Dimensional Scanning Electron Diffraction Nero *et al.,* ACS Nano **2025**, 19, 40, 35777–35786, DOI: 10.1021/acsnano.5c12291

## Research tasks

The project will focus on the development of protocols for data collection and data analysis as well as the interpretation and utilization of the resulting data to understand the hierarchical organization and how this knowledge can aid the understanding of the properties of the materials. The technique will generate large amounts of data and hence protocols for the analysis of big data will be necessary.

## Qualification requirements

Postdoctoral positions are appointed primarily for purposes of research. Applicants are expected to hold a Swedish doctoral degree or an equivalent degree from another country.

## Assessment criteria

The degree must have been completed at latest before the scholarship decision is made, but no more than six years before the closing date. An older degree may be acceptable under special circumstances.

The selection will be based primarily on scientific excellence. We are looking for an excellent candidate with prior experience in (S)TEM or scattering-based characterization techniques. Familiarity with advanced techniques in the (S)TEM such as 4D-STEM or SED is advantageous. Experience in scientific programming will be a plus.

This project involves international collaborations, hence a collaborative mindset with good communicational and organizational abilities will be important.

## Scholarship

This is a scholarship opportunity with the sole purpose of scientific studies and education, i.e., no formal employment will be in effect. The scholarship will be funded for 1+1 years, starting as per agreement.

## We offer

With us, you will experience the dynamic interaction between higher education and research that makes Stockholm University an exciting and creative environment. You will be in an international environment and get favourable conditions. The university is located in the National City Park with good transport links to the city.

Stockholm University strives to be a university free from discrimination and with equal opportunities for all.

## Contact

Further information about the position can be obtained from the PI, Assoc. Prof. Tom Willhammar tom.willhammar@su.se.

## Application

Please submit your application to Tom Willhammar (tom.willhammar@su.se), with the subject title "Postdoc scholarship". The application deadline is January 20th, 2026.

The application should include the following information:

- Your contact details and personal data

- Your highest degree

- Your language skills

- Contact details for two reference persons

- Cover letter (1 page)

- CV – degrees and other completed courses, work experience and a list of publications

- Research proposal (1 page) describing:
  - why you are interested in the project described in the advertisement
  - what makes you suitable for the project in question

  **Welcome to apply**