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Postdoc (stipend-based) in Neuromorphic devices and circuits

Electrification and digitalisation are among the major areas for the future transition to sustainable societies. The Department of Electrical Engineering conducts successful research and education in these areas - including renewable energy sources, electric vehicles, industrial IoT, 6G communication, and wireless sensor networks, as well as research and education in Life Science, health technology, smart electronic sensors, and medical systems. The Department of Electrical Engineering is an international environment with around 170 employees who contribute to important technological advances in energy and health at Ångström Laboratory.

We are now looking for a postdoctoral researcher in electrical engineering.

Come and join us!
The position is placed at the Division of Solid-State Electronics, within the Department of Electrical Engineering. Here you will find a welcoming working environment with an active doctoral student network and a variety of experimental projects. The division collaborates with Swedish companies – both public and private – as well as other stakeholders within the various research areas. We look forward to receiving your application. Join us in building the future!

Read more about our benefits and what it is like to work at Uppsala University

Project description
The human brain contains a vast number of neurons and synapses that enable unparalleled signal processing and computing functionalities. Inspired by this, neuromorphic computing (NC) mimics how the brain computes using electronic components. NC has thereby emerged as a promising technology for solving high-complexity puzzles efficiently. Nanopore/nanochannel-based ionic devices (iontronic devices), operating in an electrolyte environment, have recently emerged as competitive candidates for realizing NC. They offer unique advantages, including abundant nonlinear mechanisms for mimicking neuromorphic behavior, high biocompatibility, and low energy consumption.

In this project, we will develop ionic neuromorphic devices and integrate them with electronic device-based neuromorphic units to create small-scale functional modules. These circuits will emulate neural behavior, aiming for low-power and high-efficiency computation. This project involves both experimental development/measurement and theoretical modelling/investigation. Therefore, it requires the candidate to have a solid background in physics, electronics, and mathematics, as well as strong practical experimental skills.

Duties
Design and fabricate neuromorphic devices based on standard silicon technology in a clean-room laboratory; characterize the devices by basic translocation and trapping experiments.

Design and realize small-scale neuromorphic circuits based on the developed novel devices

Model and simulate the neuromorphic devices and circuits.

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Qualifications required
Doctoral degree or a foreign degree equivalent to a doctoral degree in electronics (electronic science, electronic engineering or electrical engineering), physics, and relevant subjects.

The degree needs to be obtained by the time of the start of this project. Those who have obtained a PhD degree three years prior to the application deadline are primarily considered. The starting point of the three-year frame period is the application deadline. Due to special circumstances, the degree may have been obtained earlier. The three-year period can be extended due to circumstances such as sick leave, parental leave, duties in labor unions, etc.

We value your personal qualities, including strong motivation and good teamwork ability. The candidate must have excellent communication skills in English, both orally and in writing.

Qualifications desired
Experience in clean room nanofabrication, circuit and system design, nanopore sensing experiments, or modeling ion transport in nanoconfinements.

About the position
This is a stipend-based position and does not constitute formal employment at Uppsala University. The stipend is intended to cover living costs and is tax-exempt under current regulations (subject to the applicant's individual tax situation). The stipend is offered for a duration of 24 months. Start date 2026-09-01 or as agreed. Full-time. Location: Uppsala.

For further information about the position, please contact
Assistant Professor Chenyu Wen, telephone +46 762275768, chenyu.wen@angstrom.uu.se.

Application instructions
The application should include 1) a cover letter describing yourself, your research interests and why you are applying for this stipend-based position, 2) your CV, 3) a copy of your doctoral degree certificate and academic transcripts, including a copy of the doctoral thesis, 4) any other documents you wish to refer to, 5) the names and contact details of referees (email address and telephone number). The application should be written in English. All the application materials should be sent to chenyu.wen@angstrom.uu.se **no later than June 20, 2026**.

Are you considering moving to Sweden to work at Uppsala University? Find out more about what it´s like to work and live in Sweden.

Uppsala University is a broad research university with a strong international position. The ultimate goal is to conduct education and research of the highest quality and relevance to make a difference in society. Our most important asset is all of our 7,600 employees and 53,000 students who, with curiosity and commitment, make Uppsala University one of Sweden’s most exciting workplaces.