

Two Doctoral Researchers in electrochemical modelling
and in high-throughput electro-chemistry
Aalto University

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Posted Oct. 29, 2024, set to expire Feb. 28, 2025

Job Title	Two Doctoral Researchers in electrochemical modelling and in high-throughput electro-chemistry
Department	T105 Chemistry and Materials
Institution	Aalto University , , Finland
Date Posted	Oct. 29, 2024
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Graduate Student
Academic Field(s)	Chemistry - General
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Two-Doctoral-Researchers-in-electrochemical-modelling-and-in-high-throughput-electro-chemistry_R41285

Apply By Email

Job Description

Aalto University is where science and art meet technology and business. We shape a sustainable future by making research breakthroughs in and across our disciplines, sparking the game changers of tomorrow and creating novel solutions to major global challenges. Our community is made up of 13 000 students, 400 professors and close to 4 500 other faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. Diversity is part of who we are, and we actively work to ensure our community's diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

[url=https://www.aalto.fi/en/school-of-chemical-engineering]The School of Chemical Engineering is one of the six schools of Aalto University. It combines natural sciences and engineering in a unique way.

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The Department of Chemistry and Materials Science is looking for:

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for the Electrolytic processes group at Aalto University. The positions are funded 36 months doctoral student positions in the Doctoral Network "PREDICTOR". PREDICTOR is financed by the European Union under the framework of the program HORIZON Europe, Marie Skłodowska-Curie Actions. The tentative starting date is 1.4.2025.

Marie Skłodowska-Curie Doctoral Networks are joint research and training projects funded by the European Union. Funding is provided for doctoral researchers from both inside and outside Europe to carry out individual project work in a European country other than their own. The training network "PREDICTOR" is made up of 22 partners, coordinated by Fraunhofer ICT in Germany. The network will recruit a total of 17 doctoral researchers for project work lasting for 36 months.

PREDICTOR aims to establish a rapid, high-throughput method to identify and develop materials for electrochemical energy storage. It will enable the rapid identification, synthesis and characterization of materials within a coherent development chain, replacing conventional trial-and-error developments. To validate the PREDICTOR system, the case study will be active materials and electrolytes for redox-flow batteries. Within the project, three demonstrator battery cells (TRL3-4) will be assembled and tested with the newly developed materials.

The electrochemical modelling doctoral researcher will work on the development of solid booster concept, (see for example <https://doi.org/10.3390/molecules26082111>), where redox active solid materials are deposited into the tanks of the flow battery to improve the energy storage density. Their project focuses on modelling of the reactor, including charge transfer between soluble and solid redox couples and mass transfer in porous media. The developed model will be finally coupled to macroscopic cell model developed by other PREDICTOR partners. Input data for modelling will be available from DFT calculations carried out within PREDICTOR. The training of the doctoral researcher will specialize in finite element modelling of electrochemical systems, electrochemistry and electrochemical engineering.

The high-throughput electrochemistry project relates to acceleration of discovery of new materials for flow batteries. You will develop high-throughput synthesis for flow battery materials employing a pipetting robot and a well-plate, different high-throughput characterization methods (electrochemical, spectroscopic etc.) for evaluating the properties and methods for high throughput stability testing. This work connects to automated methods as well as AI tools developed by other PREDICTOR partners.

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The training of the doctoral researcher will specialize in electrochemistry and synthesis of metal complexes.

The work will be carried out at Aalto University, over a period of 36 months, with the tentative starting date of 1.4.2025. The candidates will join the [\[url=https://www.utu.fi/en/university/faculty-of-technology/mechanical-and-materials-engineering/research/battery-materials-and-technologies#:~:text==The%20research%20group%20of%20Battery%20Materials%20and%20Technologi](https://www.utu.fi/en/university/faculty-of-technology/mechanical-and-materials-engineering/research/battery-materials-and-technologies#:~:text==The%20research%20group%20of%20Battery%20Materials%20and%20Technologi) group of Prof. Pekka Peljo. Our group will move to Aalto University 1.4.2025. We specialize in electrochemistry of flow batteries, including expertise in modelling of electrochemical systems.

Your background and expertise

The selected persons will be appointed for a fixed term. For the electrochemical modelling position, the successful candidate will conduct experimental scientific research aiming at the completion of a doctoral degree and high impact scientific publications in the field of high-throughput electrochemistry. Focus areas involve electrochemistry and inorganic synthesis. For the high-throughput electrochemistry position, the successful candidate will conduct computational scientific research aiming at the completion of a doctoral degree and high impact scientific publications in the field of modelling of electrochemical systems. Focus areas involve electrochemical engineering and finite element modelling of electrochemical systems. The positions also involve participation of departmental teaching and student instruction.

We expect you to have a Master's degree with focus on physical chemistry, electrochemistry or related field. The positions require an active approach, diligence and cooperation skills. We also expect you to have good study grades and you should demonstrate strong aptitude to research of especially electrochemical systems. For the electrochemical modelling position it would be beneficial to have expertise in computational methods such as COMSOL Multiphysics or Python etc. for modelling of mass transfer. Background in electrochemistry would also be beneficial. For the high-throughput electrochemistry position it would be beneficial to have expertise electrochemistry, flow batteries, programming (Python etc.). Background or interest in robotics and electronics would also be beneficial. In these positions you need sufficient chemical and mathematical background and good computer skills.

In accordance with the European Union's funding rules for doctoral networks, applicants must NOT yet have a PhD. Additionally, the applicant must not have resided or carried out her/ his main activity (work, studies etc.) in Finland for more than 12 months in the past 3 years.

What we offer

The recruited researcher will have the opportunity to work as part of an international, interdisciplinary

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team of 17 doctoral researchers, based at universities and industrial firms throughout Europe. She/he will be supported by two mentors within the PREDICTOR project and will have multiple opportunities to participate in professional and personal development training. Through her/his work she/he will gain a unique skill-set at the interface between modelling and simulation, high-throughput experimentation / characterization and self-optimization and data management over different length scales from nano to the macroscopic level.

She/he is expected to finish the project with a PhD thesis and to disseminate the results through patents (if applicable), publications in peer-reviewed journals and presentations at international conferences.

The selected candidates join the scientific environment of [\[url=https://www.aalto.fi/en/department-of-chemistry-and-materials-science\]](https://www.aalto.fi/en/department-of-chemistry-and-materials-science)Department of Chemistry and Materials Science. Our main campus is located in Espoo, Finland, in the capital Helsinki region. Helsinki is the lively, dynamic capital of Finland with active international social scene, good opportunities for culture or outdoor activities, and reputedly high quality of living in general.

During the first year you will apply for the study right in doctoral studies at Aalto University School of Chemical Engineering. Please check the student information and admission criteria at [\[url=https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-chemical-engineering\]](https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-chemical-engineering)<https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-chemical-engineering>. In particular, please pay attention to the mandatory skill level in English. Monthly gross salary will be approx. 3000-3400 €/month (including mobility allowance, but excluding other allowances that depend on eligibility, e.g. family allowance, special needs allowance).

The contract includes occupational health benefits and Finland has a comprehensive social security system

How to apply

To apply, please submit your application at your earliest convenience but no later than 30.11.2024 through our online recruiting system by using the link provided.

Please note: Aalto University's employees and visitors should apply for the position via our internal system Workday -> Internal Jobs by using their existing Workday user account.

Please attach to the application in English and as PDF files *

A letter of motivation *

A complete curriculum vitae describing education and employment history, as well as, list of possible

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scientific publications *

Transcript of study records for both M.Sc. and B.Sc. degrees *

Contact details of at least 2 possible reference letter writers

Evaluation of the applications may start immediately.

Additional information is available from Prof. Pekka Peljo (firstname.lastname(a)aalto.fi).

Contact Information

Please reference Academickeys in your cover letter when
applying for or inquiring about this job announcement.

Contact

Finland