



Junior Researcher, Modelling of hydrogen production in power-to-food project

Lappeenranta University of Technology, LUT. LUT's Trailblazer strategy is searching for answers to four key questions: Are we going to burn up everything? Is humanity condemned to suffer from the water it has polluted? Will waste be the grave of our future? Will we let Europe degenerate to the world's backyard? No. We will lead the way with a trailblazer spirit. We have been ranked among the world's top universities (Times Higher Education and QS rankings). We are compact by size, with intensely focused operations. Combining technology and business, we have served as an academic forerunner since 1969. Our international science community encompasses 6,500 students and experts.

REFLEX is a multidisciplinary research platform at LUT. Our main vision is for the future energy system to be mainly based on solar and wind power. In our vision, the other energy consuming sectors will be indirectly electrified e.g. through hydrogen generation by water electrolysis. The hydrogen can be further used with renewable or atmospheric CO₂ to create renewable synthetic fuels, chemicals or even food by thermochemical or bio-based synthesis processes. The operational flexibility of the energy system is delivered by different energy storage and demand response technologies. The resulting decarbonized energy system will not be carbon-free, but it will recycle atmospheric carbon by using it both as an energy carrier and as a valuable raw material.

We are looking for a highly qualified and motivated

Junior Researcher to join our team.

The candidate will be working in a consortium research project funded by the Academy of Finland with the objective to participate in the research and development of a bioreactor producing single-cell proteins by microbial fermentation. In the studied concept, CO₂ is captured directly from the air, and solar or wind power is used as the source of electricity. The microbes in the bioreactor use hydrogen as their energy source and CO₂ as the main building material. A press release on the ongoing research is available [here](#).

The work of the junior researcher will focus on experimental and computational research on the hydrogen production efficiency of “in-situ” water electrolysis with different anode and cathode structures. In addition, the potential of using an external water electrolyzer with the required dilution process as an alternative hydrogen source should be studied.

Applicants must hold a Master’s degree (M.Sc. or equivalent) in a relevant field giving eligibility for doctoral studies and be able and motivated to complete the doctoral degree in the target time of four years. The research topic is multidisciplinary. Applicants should have a strong background in the theory and numerical modelling of electric conduction or fluid dynamics phenomena. Experience in electrochemistry is advantageous.

Finite element analysis (FEA) and possibly computational fluid dynamics (CFD) must be applied in the research, and therefore, experience in the use or development of FEA (Elmer, Ansys, Flux) or CFD (Fluent, OpenFOAM) software is appreciated. Further, experience of the Matlab and LabVIEW environments is desirable. The applicant must be able to work in a laboratory environment and report the results in fluent English with LaTeX and MS Office tools.

Junior researchers aim to complete the doctoral degree in four years. The employment relationship of a junior researcher is fixed-term with a four-month trial period. The position will be available initially for one year and can be extended for another three years, provided that the doctoral studies and research have progressed well.

The pay will be determined in accordance with the pay system for university teaching and research staff. The job grade of a junior researcher is 1-4 (EUR 1 808.42 – 2 475.31/month). In addition, the salary will include an individual pay component based on performance and competence, amounting to a maximum of 46.3% of the job-specific pay component.

Starting date: October 2017 or as **agreed**.

Please submit your application by filling out the online application form (link below) with the required attachments. The deadline for applications is **15 September 2017 (at midnight, Finnish local time, UTC + 3hr)**. Applications received after the deadline will not be considered.

The application is to include the following attachments:

- A curriculum vitae
- Certificates/diplomas: scanned electronic copies of diplomas and transcripts of the records of relevant previous degrees. If the original documents are not in English, Finnish or Swedish, each document must be accompanied by an official certified translation into English or Finnish.
- You may also attach a separate application describing your motivation as a researcher.
- A list of scientific publications (optional).

For further information, please contact Professor Jero Ahola, tel. +358 40 529 8524 and Post-Doctoral Researcher Vesa Ruuskanen, tel. +358 50 371 1313, e-mail: [firstname.surname\(at\)lut.fi](mailto:firstname.surname(at)lut.fi), twitter: @JeroAhola

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