Job Posting

Recruiting organisation

Technical University of Denmark (DTU)

Subproject title

Advanced EIS characterisation of electrodes

Starting date

1st April 2026 (or earlier if preferred)

Salary

The Doctoral Network "SPACER" is financed by the European Union under the framework of the program HORIZON Europe, Marie Skłodowska-Curie Actions. The doctoral candidate will be hired for 36 months under contract by DTU, with a monthly gross salary starting at approx. 35,700 DKK (including pension contribution and mobility allowance, but excluding other allowances that depend on eligibility, e.g. family allowance, special needs allowance). The appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. The allowance will be agreed upon with the relevant union.

Background Information

Marie Skłodowska-Curie Doctoral Networks are joint research and training projects funded by the European Union. Funding is provided for doctoral candidates from both inside and outside Europe to carry out individual project work in a European country other than their own. The training network "SPACER" is made up of 21 partners, coordinated by Fraunhofer ICT in Germany. The network will recruit a total of 17 doctoral candidates for project work lasting for 36 months.

SPACER aims to develop new architectures for porous electrodes to improve the power density and energy efficiency of redox flow batteries (RFB), enabling affordable and durable long-duration energy storage. The approach is to use hierarchical structures, i.e. complex material layers that can be optimized to specific battery chemistries and flow phenomena from the microscale up. The developed technologies will be validated in half-cells and full working batteries at industrial partners at TRL 6.

Our objectives

- Multiscale **modelling** to better understand RFB behavior and identify optimal hierarchical shaped pore- and electrode-structure to encounter optimum electrolyte as well as electrical flow.
- **Prototyping** of the identified structures via stereolithographic, 3D printing and textile techniques like tufting, machine-based embroidery techniques or non-interlaced 3D pre-forming.
- Development of **advanced imaging and characterization technologies** (X-ray micro tomography, EPR imaging and spectroscopy) to evaluate performance of electrodes and to map electrolyte chemical composition in micrometer resolution, allowing validation of the model predictions.
- **Validation and evaluation** of the RFBs with optimized hierarchical electrodes.

Job Description

The advertised subproject is fully funded by the Marie Skłodowska-Curie European Training Network "SPACER". It will be carried out by one doctoral candidate at DTU, over a period of 36 months.

Your task will be to use electrochemical impedance spectroscopy and other complimentary characterisation techniques to provide holistic and detailed performance characterisation of new hierarchical porous carbon electrodes developed in the network. You will leverage advanced data analysis methods such as Distribution of Diffusion Times to obtain insight into mass transfer and microstructural effects in the new generation of electrodes. The project will be carried out in collaboration with network partners, requiring 3-6 months of secondments abroad.

Benefits

The recruited researcher will have the opportunity to work as part of an international, interdisciplinary team of 17 doctoral candidates, based at universities and industrial firms throughout Europe. She/he will be supported by two mentors within the SPACER project, and will have multiple opportunities to

Job Posting

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 prototyping of electrode materials, including characterization of electrodes using spectroscopical and electrochemical techniques at different levels from micro-scale to macro-scale.

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.

DTU is a leading technical university globally recognized for the excellence of its research, education, innovation, and scientific advice. We offer a rewarding and challenging job in an international environment with an inclusive, family-friendly, evolving, and informal working environment. We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility.

Requirements

Qualifications/experience

- In accordance with the European Union's funding rules for doctoral networks, applicants must NOT yet have a PhD
- You must have a two-year master's degree (120 ECTS points) or a similar degree with an academic level equivalent to a two-year master's degree.
- Your MSc degree (or equivalent) is in Chemical Engineering, Physics, Chemistry, Materials Science, or related disciplines.
- You have an aptitude for experimental research and data analysis.
- Experience with programming and/or mathematical modelling is an advantage.
- Excellent written and oral communication skills in English are prerequisites.

The scholarships for the PhD degree are subject to academic approval, and the candidates will be enrolled in one of the general degree programmes at DTU. For information about our enrolment requirements and the general planning of the PhD study programme, please see DTU's rules for the PhD education.

Mobility:

The applicant must not have resided or carried out her/ his/her main activity (work, studies etc.) in Denmark for more than 12 months in the past 3 years.

How to apply

Applications are accepted only electronically through the application form available at https://efzu.fa.em2.oraclecloud.com/hcmUI/CandidateExperience/en/sites/CX_2001/job/6171/?utm_medium=jobshare&utm_source=External+Job+Share

Contact:
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Application deadline: 30th November 2025