FLOW CAMP

REDOX FLOW BATTERY CAMPUS

MARIE SKŁODOWSKA-CURIE EUROPEAN TRAINING NETWORK „FLOWCAMP" (H2020-MSCA-ITN-2017) TO IMPROVE MATERIALS FOR NEXT-GENERATION REDOX-FLOW BATTERIES

JOB POSTING

Recruiting organisation:
Amer-Sil S.A., Luxembourg

Subproject title:
Fabrication and study of ion-exchange membranes for redox flow batteries formed by wet chemistry and plasma coating of porous substrates with ionomers.

Starting date:
February - June 2018 (exceptions can be made in special cases regarding the graduation procedure at candidates' current universities)

Background information:

Marie Skłodowska-Curie European Training Networks (ETNs) are joint research and training projects funded by the European Union. Funding is provided for postgraduate researchers from both inside and outside Europe to carry out individual project work in a European country other than their own.

The training network "FlowCamp" is made up of 11 partners, coordinated by Fraunhofer ICT in Germany. The network will recruit a total of 15 postgraduates for project work lasting for 36 months.

Renewable energy sources like wind turbines require large-scale, stationary energy storage systems to balance out fluctuations in energy generation. FlowCamp will advance the development of one of the most promising storage systems: redox-flow batteries (RFBs). The recruited fellows will develop materials (membranes, electrodes, electrolytes, catalysts, sealing materials) and macrohomogeneous models for three next-generation RFBs (hydrogen-bromine, organic and zinc-air systems). They will then upscale the new systems to prototype level and validate them using the cutting-edge battery testing facilities available for the prestigious German-funded RedoxWind project at Fraunhofer ICT. The new RFB technologies can be combined in energy storage systems tailored to a wide variety of application scenarios, with lower cost, longer service life and higher efficiency than conventional (e.g. Li-ion) storage devices.

Job description:

The advertised subproject will be carried out by one postgraduate ("early-stage researcher") at Amer-Sil (Luxembourg) with collaboration and doctoral promotion at CNRS/University of Lorraine (France) over a period of 36 months. The collaborating institutions and supervisors are:

Amer-Sil SA - Kehlen, Luxemburg
www.amer-sil.com
Dr. Mateusz Donten

LCPME (CNRS) - Nancy, France
www.lcpme.cnrs-nancy.fr
Dr. Mathieu Etienne

IJL (CNRS) – Nancy, France
www.ijl.univ-lorraine.fr
Dr. Gerard Henrion

Amer-Sil is a globally known company producing battery separators for industrial lead acid batteries. Its headquarters and R&D center is located in Luxembourg, and has been operating for nearly 50 years. Its R&D department is a team of about 10 young but experienced researchers (3 with PhD degree) involved in a number of dynamic projects in and outside energy storage applications. Amer-Sil porous PVC-silica membrane is a patented unique product. During the Flow-Camp project it will be adapted to serve new types of batteries. The FlowCamp PhD candidate will be affiliated

jointly with Amer-Sil and Centre National de la Recherche Scientifique (CNRS). Two institutes, LCPME (mathieu.etienne@univ-lorraine.fr) and IJL (gerard.henrion@univ-lorraine.fr), located in Nancy will provide access to excellent research infrastructure and scientific guidance. The doctorate degree will be awarded by University of Lorraine.

The objective of the PhD is the controlled modification of porous membranes for improved performance in redox flow batteries. The work includes making ion-exchange membranes by deposition and curing of ionomer coatings and plasma polymerization on porous substrates, chemical and physical characterization of the obtained membranes. The membranes will be tested in laboratory RFB systems to define guidelines for scaling up of the best selected materials. The expected results are at least one ion exchange porous separator for RFBs with good electrochemical performance and a clear possibility for economical industrial production to commercialized RFB systems.

This subproject is fully funded by the Marie Skłodowska-Curie European Training Network "FlowCamp" (H2020-MSCA-ITN-2017). The recruited researcher will have the opportunity to work as part of an international, interdisciplinary team of 15 postgraduates, based at universities and industrial firms throughout Europe. She/he will gain a unique skill-set comprising electrochemistry, material science and cell design/ engineering, as well as an overview of different RFB technologies and their implementation at prototype 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.

Requirements:

Qualifications / experience:

- Early-stage researcher: a researcher without a PhD, who is in the first four years (full-time equivalent research experience) of her/his research career, measured from the date when she/he obtained the degree which would formally entitle her/him to embark on a doctorate
- Master Degree (or equivalent) with a major relevant to physical chemistry, electrochemistry, membrane technology, material fabrication; excellent study record
- Solid foundations in physical and analytical chemistry
- Experience in plasma technology is considered positively
- At least basic understanding of organic chemistry
- Knowledge of coating techniques and processes is an advantage
- Understanding of membrane processes and materials is an advantage
- Good ability to formulate research questions, design experiments and critically interpret their results
- Ability to carry out a cross institution project – good work discipline, firm goal orientation and micromanagement skills
- Skills in scientific communication and writing, particularly result reporting (in English)
- Languages: English – excellent proficiency is a must; French – is considered a significant advantage

Mobility:

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

- She/he must be prepared for frequent travel between Kehlen, Luxembourg and Nancy, France (where the collaborating institutions are present) and to lesser extent to other FlowCamp partners locations within the EU.

Please note:

Candidates are informed that before recruitment, their application will be submitted for approval by the French Security Officer in order to obtain access right to IJL research facilities.

How to apply:

Please send your application documents by post or e-mail (preferably) to the following address, quoting the reference "FlowCamp-AME-ESR1":

Dr. Mateusz Donten
mateusz.donten@amer-sil.com

61 Rue d'Olm
L-8281 Kehlen
Luxembourg

List of documents: CV, motivation letter, copy of passport/EU ID card. Optional: letter(s) of recommendation.

Application deadline: 31st December 2017