ESR 7: Proton-conducting membranes for artificial leaf

Objectives
The PhD will focus on the elaboration of proton-conducting polymers based on grafted and block copolymers as the artificial leaf keystone for electrolytic water splitting, H₂ generation and CO₂ reduction.

- Elaboration of polymer film by electron-irradiation followed by monomer grafting
- Block copolymers by living-anionic or controlled radical polymerization with a high hydrophobic sequence and a proton conductive block by post-modification.
- Development of the environmental study for the synthesis of the planned conductive polymers and the technologies and processes for the production of proton-conductive membranes.

- Thin film structure characterization by profilometry and scanning electron microscopy, defectivity evaluation and upscaling yield assessment.
- Implementing scalable printing techniques for depositing large area conductive membranes.
- Assess the environmental and economic sustainability of the related technologies and products by means of LCA and LCC methodologies.

This is an interdisciplinary project involving the synthesis of polymeric materials with designed macromolecular architectures including advanced thin film structure characterization and scalable printing techniques.

Host Institutions and Secondments
The student will complete a PhD with an inter-disciplinary supervisory team and benefit from a world-class training programme, including placements with 4 international partners in the following sequence:

- 12 months in University of Stuttgart (Germany)
- 2 months in Eurecat (Spain) - secondment
- 13 month in UPPA (France)
- 3 months in Eurecat (Spain) - secondment
- 6 months in Riva Batteries (Germany)

The candidate will be awarded a double PhD diploma of University of Stuttgart and Université de Pau et des Pays de l’Adour. PhD supervisors are Dr Jochen Kerres (University of Stuttgart, www.uni-stuttgart.de), and Prof. Laurent Billon (UPPA, www. www.univ-pau.fr).

Qualifications
- Master’s degree in organic and polymer chemistry.
- Strong interest in material science and physical chemistry.
- Interested in the proton-conductive characterization of functional materials.
- Strong interest in interdisciplinary scientific work.
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication and writing skills.
- Willingness to work in collaborative projects with multiple partners.
- Very good English language skills.
- Self-motivation and the ability to achieve goals independently as well as to contribute effectively to the team.
- Willing to travel within the EU and spend extended periods of time in various EU countries.
- Familiarity with environmental, health and safety (EHS) requirements.

Recruitment conditions
The candidate will be employed by University of Stuttgart (Germany), UPPA (France) and Riva Batteries (Germany), on a standard MSCA salary base (including mobility and family allowance) during 3 years.
Successful applicants will be required to start latest 1 October 2018 for a period of 3 years. Candidates are required to meet the Marie Skłodowska-Curie Early Stage Researcher eligibility criteria ([https://ec.europa.eu/research/mariecurieactions/sites/mariecurie2/files/msca-itn-fellows-note_en_0.pdf](https://ec.europa.eu/research/mariecurieactions/sites/mariecurie2/files/msca-itn-fellows-note_en_0.pdf)) At the time of the appointment candidates must have had less than four years full-time equivalent research experience and must not have already obtained a PhD. Additionally, they must not have resided or carried out their main activity (work, studies, etc.) in Germany for more than 12 months in the last 3 years immediately prior to the starting date.

Any appointment will be conditional upon satisfactory references, the fulfilment of any conditions specified in the offer of a place on a PhD programme, and confirmation of the right to work in the EU and ability to secure a valid visa.

Selections will be made regardless of gender, nationality, religion, ethnicity and cultural background, but aiming for a good balance among the group.

**Selection process**
A first selection process will consist of a screening of the curriculum vitae, academic course transcripts, a motivation letter and 2 recommendation letters. The short-listed candidates will be interviewed by teleconference/skype by the selection committee. The selected candidate will be approved by the selection committee.

**Apply for this job**
Send your application (CV, motivation letter, 2 recommendation letters together with academic course transcripts, all documents should be in English) to the following address:
esr7-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR7 position within the eSCALEd project.
Please check that you meet all eligibility criteria

The closing date for receipt of applications is **20 May 2018, 18:00 CET**