

14 Marie Skłodowska - Curie Positions for Early Stage Researchers in the Field of Artificial Photosynthesis

The eSCALED consortium, in collaboration with the Horizon 2020 Marie Skłodowska-Curie programme, is delighted to offer 14 Early Stage Researcher positions. The successful candidates will enrol in double PhD programs involving 2 partner universities, starting latest in October 2018, for ground-breaking research on Artificial Photosynthesis Devices.

Artificial photosynthesis, defined as a manner to store solar energy in chemical bonds (solar fuels) has the potential to provide significant economic, environmental and social benefits. A cost effective and reliable process would have a tremendous societal impact since this achievement could transform European and worldwide energy production, distribution and policies in the near future. However, it still represents a significant scientific and technological challenge. eSCALED is an innovation-oriented project using bioinspiration as a creative enhancing tool.

The eSCALED collaborative project brings together for the first time, 11 internationally recognized academic and industrial research groups. The project has an interdisciplinary scientific approach integrating the latest knowledge on (bio-)catalysis, photovoltaics, polymer chemistry and nanostructuration by self-assembly. eSCALED is expected to generate breakthroughs in the development of artificial photosynthetic leaves as photoelectrochemical devices, educate highly trained researchers and induce novel cross-disciplinary collaborations.

eSCALED will provide the Early Stage Researchers with exciting high mobility projects in a multicultural environment. The students will register for a PhD and work under the supervision of an international and interdisciplinary team of supervisors towards solving a specific challenge related to the eSCALED project. In parallel, the eSCALED framework will offer the young researchers an enhanced and comprehensive training, tailored workshops, a summer school, and lectures to facilitate sharing of knowledge, acquisition of new skills and career development.

ESR 1: Microporous functional electrodes for Electrochemical Water Oxidation

ESR 2: Molecular water oxidation catalysts for photo-electrochemical water splitting

ESR 3: Novel electrode materials for hydrogen production based on molecular catalysts

ESR 4: Biohybrid electrode materials for hydrogen evolution

ESR 5: Encapsulation of synthetic metal complexes for catalytic carbon dioxide reduction in nanostructured electrodes

ESR 6: Porous Bio-inspired Polymer Electrode Functionalized with Enzymes for Catalytic Carbon Dioxide Reduction

ESR 7: Proton-conducting membranes for artificial leaf

ESR 8: Proton-conducting membranes based on polymeric triphenyl methane dyes

ESR 9: Perovskite Semiconductor Nanocrystals for Multi-Junction Solar Cells

ESR 10: Functional Enzymatic/Catalytic CO₂/H⁺ Reduction Electrochemical Devices.

ESR 11: Functional electrodes for water oxidation and CO₂/H⁺ reduction by evaporative coatings of nano-composites

ESR 12: Assembly of New Fluorinated Proton Conducting Membrane coupled with catalyst-immobilized Porous Polymer Electrode for CO₂Reduction

ESR 13: Low-cost Integration of efficient robust and inexpensive nanoparticles catalysts in full membrane electrode assembly and electrolyzers

ESR14: Integrating Multi-Junction Cells, Membranes and Molecular Catalysts into Devices

ESR 1: Microporous functional electrodes for Electrochemical Water Oxidation

Objectives

The PhD project has its focus on the synthesis and characterization of microporous polymer electrodes decorated with heterogeneous water oxidation catalysts.

The successful candidate will contribute to the following tasks:

- Synthesis of molecular Water Oxidation Catalysts (WOC) modified with functional groups for
 - direct attachment to conductive polymers
 - incorporation into metal-organic frameworks (MOFs) networks
- Synthesis of MOFs containing WOC motifs.
- Synthesis of oxidatively rugged polymers.
- Incorporate the catalyst and MOFs in the microstructured electrode by the “breath figure” process to create bio-inspired structures.
- Implementing scalable printing techniques for depositing modified WOC-polymers on large area conductive substrates.
- Assess the environmental and economic sustainability of the related technologies and products by means of LCA and LCC methodologies.

This is a multidisciplinary project involving the synthesis of inorganic materials including coordination compounds and metal organic frameworks as well as conductive organic polymers and surface chemistry.

Host Institutions and Secondments

The chosen candidate will complete a PhD with an inter-disciplinary supervisory team and benefit from a world-class training programme, including placements with 4 international partners.

- 10 months in ICIQ (Spain)
- 12 months in University of Uppsala (Sweden)
- 9 months in UPPA (France)
- 5 months in Eurecat (Spain) - secondment
- 12 months in University of Uppsala (Sweden)

The candidate will be awarded a double PhD diploma of Uppsala University and Université de Pau et des Pays de l'Adour. PhD supervisors are Prof. Sascha Ott (Uppsala University, www.kemi.uu.se) and Prof. Laurent Billon (UPPA, www.univ-pau.fr). The expected time for a PhD degree in Sweden is 4 years, and the last 12 months of the position will be in Uppsala, under the employment rules for Swedish doctoral students.

Qualifications

- Master's degree in chemistry, material science, or related disciplines.
- Strong interest in material science and advanced inorganic/organic and polymeric synthetic skills.
- Interested in the catalytic and electrochemical characterization of the functional materials and their application as anodes in the water splitting process.
- Strong interest in interdisciplinary scientific work
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and 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 student will be employed by ICIQ (Spain), the University of Uppsala (Sweden), and University of Pau (France), on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 year under Swedish standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 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). 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 Sweden 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:

esr1-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR1 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 Stockholm Time (CET or GMT+1)

ESR 2: Molecular water oxidation catalysts for photo-electrochemical water splitting

Objectives

The PhD project will develop molecular water oxidation catalysts based on metal-organic frameworks (MOFs). The successful candidate has the possibility to engage in mechanistic studies of the catalytic reaction, in particular spectroscopic characterization of short-lived intermediates. The candidate will also develop micro-structured electrodes based on MOFs and will get training on scalable printing techniques. In a second stage of the project, the candidate will be involved in the preparation of thin film organic or perovskite solar cells and will combine them with the micro-structured electrodes prepared in the first stage to build a photo-electrochemical water splitting device.

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 5 international partners in the following sequence:

- 12 months in ICIQ (Spain)
- 10 month in Uppsala University (Sweden)
- 3 months in UPPA (France) -secondment
- 3 months in Eurecat (Spain) - secondment
- 22 months in Eindhoven University of Technology (The Netherlands), of which 12 outside the project

PhD supervisors are Prof. Sacha Ott (Uppsala University, , www.kemi.uu.se) and Prof. René Janssen (TUE, www.tue.nl). The expected time for a PhD degree in the Netherlands is 4 years, and the last 12 months of the position will be in Eindhoven, under the employment rules for Dutch doctoral students.

Qualifications

- Master's degree in chemistry
- Experience in synthetic molecular chemistry
- Interested in physical chemistry, especially electrochemical processes and spectroscopic characterization
- 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 ICIQ (Spain), Uppsala University (Sweden), and Eindhoven University of Technology (The Netherlands) on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 year under Netherlands standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 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). 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 Spain 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):

esr2-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR2 position.

Please check that you meet all eligibility criteria

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

ESR 3: Novel electrode materials for hydrogen production based on molecular catalysts

Objectives

The PhD project will focus on the preparation of novel micro- to nanostructured (photo)cathode materials for hydrogen production, incorporating molecular H₂-evolving catalysts. For this purpose, derivatization of selected platforms with suitable coupling functions (azide, activated ester groups) and anchoring groups (carboxylic or phosphonic acids, pyrene moiety) will be undertaken. Their grafting onto various electrode substrates (carbon nanotubes, transparent conducting oxides...) or suitable conducting polymers will then be achieved. The hydrogen production activity of the resulting electrodes will be assessed using (photo)electrochemical techniques coupled to chromatography; mechanistic analysis will be conducted using advanced spectroscopic techniques. Scalable inkjet and spray-coating methodologies will be developed to obtain large area cathode materials that will be implemented in a complete device.

This is a multidisciplinary project involving the synthesis of novel ligands and coordination complexes as well as conductive organic polymers, their immobilization onto electrodes using surface chemistry methodologies, spectroscopic and electrochemical characterizations and electrocatalytic activity assessment. Specific training courses in electrochemistry, catalysis, polymer chemistry and upscaling process will be provided to the Early Stage Researcher within the eSCALED joint training program.

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 5 international partners:

- 17 months in Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA Grenoble, France), including a 3 month secondment in ICIQ (Spain).
- 9 months in UPPA (France), including a 3 month secondment in Eurecat (Spain).
- 10 + 12 months in University of Uppsala (Sweden).

This project will be developed under a co-tutelle agreement and the applicant will obtain a double degree from Université Grenoble Alpes (France) and Uppsala University (Sweden). PhD supervisors are Dr. Vincent Artero (CEA, France; www.solhycat.com), Pr. Leif Hammarström (Uppsala University; www.kemi.uu.se). The expected time for a PhD degree in Sweden is 4 years, and the last 12 months of the position will be in Uppsala, under the employment rules for Swedish doctoral students.

Qualifications

- Master's degree in molecular chemistry, with strong organic/inorganic synthetic skills. In addition, knowledge in electrochemical and spectroscopic characterization techniques and/or experience in materials chemistry will be appreciated.
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and willingness to work in collaborative projects with multiple partners.
- Self-motivation and the ability to achieve goals independently as well as to contribute effectively to the team and consortium
- Very good English language skills
- 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

ESR3 will be employed by the CEA (France), the University of Uppsala (Sweden) and University of Pau (France), on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 year under Swedish standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 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). 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 France 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, 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:

esr3-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR3 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 Stockholm Time (CET or GMT+1).

ESR 4: Biohybrid electrode materials for hydrogen evolution

Objectives

The PhD project will focus on the preparation of novel biohybrid cathode materials for hydrogen evolution, based on semi-synthetic or artificial hydrogenase catalysts. For this purpose, various dinuclear iron complexes will be synthesized and incorporated into suitable protein matrices, using methodologies previously developed in the host laboratories [Berggren et al. Nature 2013]. Methodologies will be developed to anchor such biohybrid catalysts onto nanostructured electrode substrates (carbon nanotubes, structured conducting polymers and nanoporous metal oxide materials). These hybrid materials will be characterized using a range of advanced spectroscopic techniques and their hydrogen evolution activity will be assessed using electrochemical methods coupled to chromatography. Selected materials will then be investigated for device implementation and analysed by means of life cycle assessment (LCA) and life cycle cost analysis (LCC).

This multidisciplinary project will involve the synthesis of organometallic compounds, the isolation and derivatization of host proteins, characterization and immobilization of artificial enzymes using surface chemistry methodologies and bio-electrochemical techniques for catalytic assessment.

Moreover, a training on polymer design and sol-gel chemistry for catalyst immobilization and stabilization will be carried out. Finally, the student will assess the environmental and economic sustainability of the related technologies and products by means of LCA and LCC methodologies.

Host Institutions and Secondments

The candidate will complete a PhD with an interdisciplinary supervisory team and benefit from a world-class training programme, including placements with 5 international partners with the following employment schedule:

- 11 months at the Department of Chemistry - Ångström, Uppsala University (Sweden)
- 22 months at the Laboratory of Chemistry and Biology of Metals in CEA-Grenoble (France)
including 3-month secondments at the University of Namur (Belgium) and Université de Pau et des Pays de l'Adour (France)
- 3 months in Eurecat (Manresa, Spain)
- 12 months in University of Uppsala (Sweden)

The candidate will be awarded a double PhD diploma of Uppsala University and Université Grenoble Alpes. PhD supervisors are Dr. Gustav Berggren (Uppsala University, www.kemi.uu.se and www.solarfuel.se), Dr. Vincent Artero (CEA Grenoble, www.solhycat.com). The expected time for a PhD degree in Sweden is 4 years, and the last 12 months of the position will be in Uppsala, under the employment rules for Swedish doctoral students.

Qualifications

- Master's degree in chemistry or a related discipline (at the time of admission).
- Skills in inorganic and/or organometallic synthesis and biochemistry is expected
- Experience in electrochemical characterization of functionalized materials will be appreciated
- Familiarity with environmental, health and safety (EHS) requirements
- Strong interest in interdisciplinary scientific work
- Strong motivation to pursue a PhD degree
- Excellent communication skills and 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

Recruitment conditions

The candidate will be employed by the Uppsala University (Sweden), CEA (France) and EURECAT (Spain), on a standard MSCA salary base (including mobility and family allowance) during the first 3 years and 1 year under Swedish standards.

Successful applicants will be required to start October 1st 2018 at the latest for a period of 4 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). 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 Sweden 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:

esr4-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR4 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 Stockholm Time (CET or GMT+1)**

ESR 5: Encapsulation of synthetic metal complexes for catalytic carbon dioxide reduction in nanostructured electrodes

Objectives

The PhD project will focus on the synthesis of metal complexes, such as diphosphine cyclopentadienyl cobalt complexes, all with a variety of substituents to prepare their grafting at the surface of electrode materials. The encapsulation of synthesized metal complexes into synthetic nanoporous materials (SiO_2 , TiO_2 and $\text{SiO}_2\text{-TiO}_2$) with well-controlled nanopore size and conductive additives will be realized. The evaluation of the solid hybrid materials as catalysts for electroreduction of CO_2 to formic acid will be performed. Finally, large surface electrodes using screen printing techniques will be prepared and tested.

Host Institutions and Secondments

This project will be developed under a co-tutelle agreement and the applicant will obtain a double degree from Sorbonne University (France) and University of Namur (Belgium).

The work will take place at 5 international partners:

- Collège de France (France) for 15 months
- University of Namur (Belgium) for 12 months
- Solaronix (Switzerland) for 4 months.
- 3 months at University of de Pau et des Pays de l'Adour (France) - secondments
- 2 months secondments University of Uppsala (Sweden) - secondments
- 1 to 12 additional months in Namur.

PhD supervisors are Pr. Bao-Lian Su (Namur University, www.unamur.be) and Pr. Marc Fontecave (College de France, Sorbonne University, www.college-de-france.fr). The expected time for a PhD degree in Belgium is between 3 and 4 years, and the last 1 to 12 months of the position will be in Namur, under the employment rules for Belgium doctoral students.

Qualifications

- Master's degree in chemistry, with skills in inorganic and organic chemistry as well as characterization techniques for inorganic/organic 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 skills and 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

ESR5 will be employed by the Sorbonne University (France), University of Namur (Belgium) and SOLARONIX (Switzerland) on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 to 12 additional months under Belgian standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 years maximum. 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). 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 France 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:

esr5-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR5 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 Brussels Time (CET or GMT+1)

ESR 6: Porous Bio-inspired Polymer Electrode Functionalized with Enzymes for Catalytic Carbon Dioxide Reduction.

Objectives

The candidate will work on the preparation of relevant conductive electrodes for “encapsulation” (non-covalent binding) and “grafting” (covalent binding) of CO₂ reduction catalysts. Enzymes have been chosen as the platform for the CO₂ reduction. Reductively rugged polymers will be synthesized and functionalized to bind the catalyst. Through the application of the Life Cycle Assessment (LCA) and Life Cycle Cost analysis (LCC) methodologies, student will analyze the benefits and main hotspots since both sustainable dimensions.

Host Institutions and Secondments

This project will be developed under a co-tutelle agreement and the applicant will obtain a double degree from Université de Pau et des Pays de l'Adour (Pau, France) and Université of Namur (Belgium).

The chosen candidate will complete a PhD with an inter-disciplinary supervisory team and benefit from a world-class training programme, including placements with 4 international partners.

- 15 months in Namur University (Namur, Belgium)
- 3 months at Collège de France (Paris, France)
- 12 months at the University de Pau et des Pays de l'Adour (Pau, France)
- 2 months at the additional Uppsala University (Uppsala, Sweden)
- 3 months in Eurecat technology center (Mataro, Spain).
- Note that the thesis will end with 1 to 12 additional months in Namur.

PhD supervisors are Pr. Bao-Lian Su (Namur University, www.unamur.be) and Pr. Laurent Billon (UPPA, www.univ-pau.fr). The expected time for a PhD degree in Belgium is between 3 and 4 years, and the last 1 to 12 months of the position will be in Namur, under the employment rules for Belgium doctoral students.

Qualifications

- Master's degree in chemistry, with skills in inorganic and polymer chemistry as well as characterization techniques for inorganic/organic/polymeric materials
- Knowledge on biochemistry will be a plus
- Strong interest in interdisciplinary scientific work
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and 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 student will be employed by the University de Pau et des Pays de l'Adour (France), Université of Namur (Belgium) and the technical centre EURECAT (Spain) on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 to 12 additional months under Belgian standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 years maximum. 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). 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 Belgium 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:

esr6-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR6 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 Bruxelles Time.

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.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) 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**

ESR 8: Proton-conducting membranes based on polymeric triphenyl methane dyes

Objectives

The PhD project will focus on the synthesis the end-functionalized polymers based triphenyl methane dyes and their block copolymers homologues by chain-reinitiating process.

- Synthesis of a triphenyl methane based polymer homo and end-functionalized polymers to be modified into macro-initiators.
- Synthesis of block copolymers by chain-extension from macro-initiators synthesized by end-chain modification of the end-functionalized homopolymers.
- Upscaling of the synthesis procedure and membrane preparation for cell implementation and testing.
- Preparation of large area printed thin films by inkjet and ultrasonic spray coating, up to A4 sheet.
- Thin film structure characterization by advanced 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:

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

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 Dr. Stéphanie Reynaud (UPPA, www.univ-pau.fr).

Qualifications

- Master's degree in organic and polymer chemistry.
- Strong interest in material science and physical chemistry but also knowledge of characterization techniques for macromolecules.
- Interested in ionic 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). 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:

esr8-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR8 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**

ESR 9: Perovskite Semiconductor Nanocrystals for Multi-Junction Solar Cells

Objectives

The PhD project will focus on the development of perovskite nanocrystals inks for photovoltaic and photo-electrochemical water splitting applications. The successful candidate will be responsible of the synthesis of the inks, aiming to formulations based on environmental friendly solvents and on semiconductors with tunable bandgaps. The candidate will also take care of the thin film processing and the optical, structural and electrical characterization of nano-crystalline thin film and photovoltaic devices. The main target is the fabrication of high voltage and multi-junctions perovskite nanocrystal solar cells that can be used for photo-electrochemical solar fuel production. In addition to these research objectives the candidate will receive training on professional and personal skills for a successful career in Europe.

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 5 international partners in the following sequence:

- 12 months in Eindhoven University of Technology (The Netherlands)
- 3 month in UPPA (France)
- 10 months in Italian Institute of Technology (Italy)
- 6 months in Solaronix (Switzerland) - secondment
- 3 months in Eurecat (Spain) - secondment
- 14 months in Eindhoven University of Technology (The Netherlands), of which 12 outside the project

The candidate will be awarded a double PhD diploma of Technical University of Eindhoven and Université de Pau et des Pays de l'Adour. PhD supervisors are Prof René Janssen (TUE, www.tue.nl) , Dr. Annamaria Petrozza (IIT, www.iit.it) and Prof. Laurent Billon (UPPA, www.univ-pau.fr). The expected time for a PhD degree in the Netherlands is 4 years, and the last 12 months of the position will be in Eindhoven, under the employment rules for Dutch doctoral students.

Qualifications

- Master's degree in chemistry, material science, or related disciplines.
- Strong interest in material science and physical chemistry.
- Interested in the optical and electrical characterization of functional materials and opto-electronic devices.
- 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 the Eindhoven University of Technology (The Netherlands), UPPA (France) and the Italian Institute of Technology (Italy), on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 year under Netherlands standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 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). 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 The Netherlands 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:

esr9-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR9 position.

Please check that you meet all eligibility criteria

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

ESR 10: Functional Enzymatic/Catalytic CO₂/H⁺ Reduction Electrochemical Devices.

Objectives

The PhD project will focus on the synthesis, characterization and up-scaling of microporous polymer electrodes decorated with heterogeneous CO₂ and proton reduction catalyst.

In a first step, the student will work on the grafting of selected catalyst onto polymer, with the suitable materials based on device requirements. Microporous electrodes will be developed via breath figure methodology and catalysts will be inserted in the electrode via the synthesis of a polymer (PT PTA) bearing the catalyst (cycloaddition). Once the system will respond to the overall requirements, it will be process on scalable printing techniques methodologies based on inkjet and spray-coating for depositing prepared catalysts on large area conductive substrates, up to A4 size. This part will include the study of annealing parameters, patterning methodologies and device characterization.

Host Institutions and Secondments

This project will be developed under a co-tutelle agreement and the applicant will obtain a double degree from Université de Pau et des Pays de l'Adour (France) and Université of Namur (Belgium). The chosen candidate will complete a PhD with an inter-disciplinary supervisory team and benefit from a world-class training programme, including placements with 4 international partners.

- 12 months in Université de Pau et des Pays de l'Adour (Pau, France)
- 3-months secondments will be done at Collège de France (Paris, France) before
- 11 months at the Namur University (Namur, Belgium)
- 10 months in Eurecat technology center (Mataro, Spain)
- Note that the thesis will end with 1 to 12 additional months in Namur.

PhD supervisors are Dr Stéphanie Reynaud (UPPA) (UPPA, www.univ-pau.fr) and Pr. Bao-Lian Su (Namur University, <https://www.unamur.be/>). The expected time for a PhD degree in Belgium is between 3 and 4 years, and the last 1 to 12 months of the position will be in Namur, under the employment rules for Belgium doctoral students.

Qualifications

- Master's degree in chemistry, with skills in inorganic and polymeric synthetic as well as characterization techniques for inorganic/organic materials.
- Knowledge on biochemistry will be a plus.
- Strong interest in interdisciplinary scientific work
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and 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 student will be employed by the University de Pau et des Pays de l'Adour (France) and Université of Namur (Belgium), on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 to 12 additional months under belgian standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 years maximum. 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). 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 France 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:

esr10-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR10 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 Paris Time**

ESR 11: Functional electrodes for water oxidation and CO₂/H⁺ reduction by evaporative coatings of nano-composites

Objectives

The PhD project will focus on polymer ink formulation based on carbonaceous fillers and polymers dispersed in organic/aqueous media for electrodes deposition by inkjet in dry or wet atmosphere (Microporous electrode). Water Oxidation Catalysts and molecular catalysts for CO₂ reduction will be anchored to conductive organic polymeric structures. The inks rheological properties and thin film features will be characterized and scalable printing techniques will be used. The printed electrodes will be prepared by inkjet and spray coating with and without patterning via nano-imprint lithography of the electrode/membrane. Adhesion on proton-conductive membrane will be measured by tack and peel test.

Host Institutions and Secondments

This project will be developed under a co-tutorial agreement and the applicant will obtain a double degree from Université de Pau et des Pays de l'Adour (France) and University of Stuttgart (Germany). The student will complete a PhD with an inter-disciplinary supervisory team and benefit from a world-class training programme, including placements with 5 international partners in the following sequence:

- 12 months in UPPA (France)
- 3 months in ICIQ (Spain) - secondment
- 3 months in CEA (France) - secondment
- 6 months in University of Stuttgart (Germany)
- 6 months in UPPA (France)
- 6 months in Eurecat (Spain)

PhD supervisors are Dr Jochen Kerres (University of Stuttgart, www.uni-stuttgart.de), and Prof. Laurent Billon (UPPA, www.univ-pau.fr).

Qualifications

- Master's degree in chemistry, with skills in organic and polymeric synthetic as well as characterization techniques of polymer materials.
- Knowledge on bio and inorganic chemistry will be in advantage.
- Strong interest in interdisciplinary scientific work.
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and 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 Eurecat (Spain), 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). 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:

esr11-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR11 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**

ESR 12: Assembly of New Fluorinated Proton Conducting Membrane coupled with catalyst-immobilized Porous Polymer Electrode for CO₂ Reduction

Objectives

The PhD project will focus on the elaboration of an artificial leaf based on fluorinated membranes/(enzymatic/synthetic metal complex) CO₂ reduction electrodes stacks. This thesis deals with micro and/or hierarchically porous bio-inspired polymer electrode functionalized with enzymes/synthetic metal complex will be stacked/deposited on a new fluorinated proton electrolyte membrane PEM/anode for the CO₂ electrochemical reduction to fuels production.

- Synthesis and modification of polymers suitable for catalyst support, i.e. either sulfonated or triphenyl methane dye based polymers.
- Grafting of enzymatic/synthetic metal complex for CO₂ reduction on conductive formulation.
- Develop microporous electrode via breath figure methodology.
- Optimize electrode coating onto membrane.
- Implementing scalable printing techniques for depositing modified polymers on large area conductive substrates, up to A4 sheet.
- Optimization of the results and up scaling of the synthesis and process.

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 5 international partners in the following sequence:

- 3 months in University of Stuttgart (Germany)
- 3 months in Namur (Belgique) - secondment
- 7 months in UPPA (France)
- 12 months in Eurecat (Spain)
- 8 months in University of Stuttgart (Germany)
- 3 months in Riva Batteries (Germany) - secondment

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.univ-pau.fr).

Qualifications

- Master's degree in polymer and physical chemistry.
- Strong interest in rheology of complex fluids and film adhesion especially.
- Expertise on printing techniques and thin film formation/characterization.
- Interested in the conductive and electrical characterization of functional materials and stacks.
- 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 Eurecat (Spain), 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). 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:

esr12-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR12 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**

ESR 13: Low-cost Integration of efficient robust and inexpensive catalysts in membrane electrode assembly for PV-Electrolyser technology

Objectives

The PhD project will deal with the integration in electrolyser of stable and efficient catalysts based on metal complex catalysts or on materials developed recently by the Institute Català d'Investigació Química (ICIQ), Uppsala University (UU) and CEA-Saclay (CEA) partners. Molecular catalysts, either in their molecular state or immobilized in suitable MOFs or carbon nanotubes, and Metals chalcogenides as molybdenum Sulphide coordination polymers will be investigated for water oxidation and protons reduction. These catalysts will be formulated and deposited either on electrodes or membranes (furnished by University of Stuttgart (USTUTT)) according low cost and manufacturing processes such as inkjet-printing, spray... The optimisation of the catalytic performances of the materials electrodes will be also investigated by the addition of conductive additives and the formatting of the inks. The electrolyser cells fabricated in this work will be ultimately powered by perovskite PV cells developed by Solaronix (SOLAR) and by the Fondazione Istituto Italiano di tecnologia (IIT).

The candidate will make anodes and cathodes based on coordination complex catalysts and incorporate them in PV-Electrolyser technology. Different tasks will be addressed during this Ph. D project:

- Synthesis of water oxidation and proton reduction catalysts based on coordination complexes modified.
- Functionalization of conducting organic materials and MOFs for immobilization of molecular catalysts.
- Formulation of inks with commercial or newly synthesized ionomers.
- Electrochemical characterizations of catalysts toward water splitting and hydrogen evolution at different pH.
- Fabrication of membrane electrode assemblies using implementing scalable printing techniques such as ink-jet printing, ultrasonic spray deposition, ...
- Characterizations and stability assessment of Perovskite Solar Cells.
- Implementation of MEA in an electrolyser cell coupled to a perovskite solar cell.

Host Institutions and Secondments

The candidate will complete a PhD with an inter-disciplinary supervisory team and benefit from a world-class training programme, including placements with 6 international partners.

- 10 months in CEA-Saclay (France)
- 6 months in University of Stuttgart (Germany) - secondment
- 6 months in ICIQ (Spain) - secondment
- 3 months in IIT (Italy) - secondment
- 8 months in University of Uppsala (Sweden)
- 3 months in Solaronix (Switzerland)
- 12 months in University of Uppsala (Sweden)

PhD supervisors are Prof. Leif Hammarström (Uppsala University, www.kemi.uu.se) and Dr. Bruno Jusselme (CEA-Saclay, www.universite-paris-saclay.fr). The expected time for a PhD degree in Sweden is 4 years, and the last 12 months of the position will be in Uppsala, under the employment rules for Swedish doctoral students.

Qualifications

- Master's degree in chemistry, material science, or related disciplines.
- Inorganic and organic synthetic skills.
- Interested in the catalytic and electrochemical characterization of the functional materials and their application in electrolyser.
- Strong interest in interdisciplinary scientific work

- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and 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 student will be employed by the CEA-Saclay (France), the University of Uppsala (Sweden), and Solaronix (Switzerland), on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 last year under Swedish standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 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). 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 France 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 application form, curriculum vitae, 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:

esr13-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR13 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 Paris Time (CET or GMT+1)**

ESR14: Integrating Multi-Junction Cells, Membranes and Molecular Catalysts into Devices

Objectives

The PhD project will focus in developing and demonstrating an integrated artificial leaf device based on organic or perovskite semiconductors for light absorption, catalysts-supported electrodes for solar fuel production, separated by a proton-conductive membrane. Activities will involve the design and definition of specifications (operation parameters, materials selection, elements and architecture, manufacturing processes) for an “artificial leaf” prototype. Subsequently the design will be implemented by combining membrane and electrodes into a membrane electrode assembly and its implementation into an electrolysis cell. The next step is to integrate this with thin film multi-junction, organic or perovskite photovoltaic cells to achieve efficient conversion of sunlight into solar fuels.

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 5 international partners in the following sequence:

- 6 months in Eurecat (Spain)
- 3 months in Riva (Germany) – secondment
- 8 months in University of Stuttgart (Germany)
- 12 months in Eindhoven University of Technology (The Netherlands)
- 3 month in UPPA (France) – secondment
- 3 month in in Eurecat (Spain) – secondment
- 12 months in Eindhoven University of Technology (The Netherlands), outside the project

PhD supervisors are Dr. Jochen Kerres (University of Stuttgart, www.uni-stuttgart.de) and Prof. René Janssen (TUE, www.tue.nl). The expected time for a PhD degree in the Netherlands is 4 years, and the last 12 months of the position will be in Eindhoven, under the employment rules for Dutch doctoral students.

Qualifications

- Master’s degree in engineering (chemical engineering, materials engineering).
- Strong interest in polymer chemistry, electrochemistry, and photovoltaics.
- Interested in implementation of novel scientific concepts in to practical solutions.
- Strong interest in interdisciplinary scientific work, original thinker and able to solve problems.
- Strong motivation to pursue a PhD degree and to develop a cross-disciplinary cutting-edge project.
- Excellent communication skills and 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 student will be employed by Eurecat (Spain), University of Stuttgart (Germany) and Eindhoven University of Technology (The Netherlands), on a standard MSCA salary base (including mobility and family allowance) during 3 years and 1 final year under Dutch standards.

Successful applicants will be required to start latest 1 October 2018 for a period of 4 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). 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 Spain 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.

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:

esr14-application@escaled-project.eu

Please put in the object of your email that you are applying for the ESR14 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**.