

2 PhD Fellowships in Marie Skłodowska-Curie Innovative Training Network on Thiol-ene Miniemulsion Photopolymerisation

Topic 1: High Barrier Waterborne Polysulfide Dispersions (POLYMAT)

Topic 2: Polysulfide Latex Crystallization in a Nanoscale Environment and Film Formation (FREIBURG)

PRESENTATION: We invite highly motivated and creative applicants for 2 PhD positions within a collaborative project between the Institute for Polymer Materials, University of the Basque Country (POLYMAT, UPV/EHU, San Sebastian, Spain) and Institute of Physics, Albert Ludwig University Freiburg (FREIBURG, Germany). The PhD candidates will work in tandem and be part of the innovative training network (ITN) "Towards Next generation Eco-efficient PHOTO and EMULSION Polymerizations" funded through the Horizon 2020 Marie Skłodowska-Curie Actions Programme. PHOTO-EMULSION focuses on new eco-friendly chemical processes for the manufacturing of plastic products. The project aims at training a group of 8 PhD students through a high-quality research network including 8 internationally reputed academic institutions, 4 leading companies and 2 non-profit organisations. Balanced and European-wide, the project's diversity expresses through the participation of 8 different countries: Austria, France, Germany, Ireland, Poland, Slovenia, Sweden & Spain.

PhD SUBJECTS: The two research projects focus on using thiol-ene polyaddition in dispersed media to produce new functional materials. More specifically, the two projects focus on using miniemulsion polymerization to produce polymer nanoparticles. The work in POLYMAT will be focused on controlling droplet nucleation, reaction kinetics and polymer composition, whereas the work at University of Freiburg will be focused on controlling polymer architecture and crystallinity, all together directed towards production of high barrier waterborne polysulfide dispersions and anticorrosion coatings. Each PhD project includes 26 months in the main host institution (POLYMAT or FREIBURG), a 6-month secondment at the academic partner premises (POLYMAT or FREIBURG), and a 4-month secondment at an industrial partner, RISE (Stockholm).

ELIGIBILITY: At the time of recruitment, the candidate must not have resided or carried out their main activity (work, studies, etc.) in the country of their recruiting organisation for more than 12 months in the 3 years immediately prior to start of the project. Short stays such as holidays are not taken into account.

CANDIDATE REQUIREMENTS: Candidates can be of any nationality, but are required to undertake transnational mobility. Candidates should ideally possess a Master's degree in chemistry, chemical engineering, material science or a closely related discipline. Candidates must be within the first four years of her/his research career. Applications from candidates who already possess a doctoral degree will not be considered. Potential candidates should be able to demonstrate motivation and a strong eagerness to learn. Individuals must possess excellent written, oral communication in English and organizational skills. In addition, they should demonstrate the ability both to work independently and as part of a team. Previous related research experience will be a distinct advantage. Scientific curiosity with an open attitude to work interdisciplinary in the framework of international collaborations is also essential. All students must be willing to travel. The ideal starting date would be September 1st 2018.

FUNDING: PhD positions are funded at the level stipulated by Marie Skłodowska-Curie Actions funding rules with stipends starting at € 45,000 per year. Final salary calculations take into account living costs of the recruiting country. Additional family allowances are available when applicable.

APPLICATION PROCESS: applicants must select one of the two projects detailed below, the main host institution being either POLYMAT (Spain) or FREIBURG (Germany). Required documents: a full CV, a motivation letter including a description of previous research experiences and contact details, official transcript, at least one recommendation letter. Only documents in English will be accepted.

SUBMISSION: applicants should submit before **May 18th 2018** the documentation to Dr. Radmila Tomovska (POLYMAT) radmila.tomovska@ehu.es and Dr. Günter REITER (FREIBURG) guenter.reiter@physik.uni-freiburg.de, writing in the subject line the main host institution of their selected projects (e.g. Project POLYMAT or Project FREIBURG). Applications will be reviewed until the positions are filled. Applications failing to include the requested documentation, where the candidates do not meet the eligibility criteria or which do not indicate the preferred projects WILL NOT be considered.

SELECTION PROCESS: Shortlisted candidates will be invited for in-person interviews (on site or by telephone / Skype). We will endeavour to provide feedback to unsuccessful applicants where possible.

BENEFITS:

- A highly valuable double expertise in the two predominant zero-VOC polymerisations: photopolymer science and polymerisation in dispersed systems
- Interdisciplinary supervision. The PhD student will be supervised by two academics from different disciplines: Colloids and Polymer as well as Photopolymerization and in addition an industrial mentor.
- 6-month industrial secondments
- Meaningful and innovative training methods: tandem PhD, distance language learning, ESR as itinerant science educator, online courses, PhD-led subproject, highly interactive meetings and tutorials, etc.

DETAILED PhD PROJECTS:

1/ Project POLYMAT: High Barrier Waterborne Polysulfide Dispersions

PhD objectives: Synthesis of a range of polysulfide latex with controlled architectures (branching, cross-linking). Development and characterization of novel barrier films, focusing on plastic substrates (food and pharmaceutical packaging)

Location: Institute for Polymer Materials (POLYMAT, UPV/EHU, San Sebastian, Spain).

Principal investigator: Prof. Radmila Tomovska (POLYMAT, Spain)

Collaborators: Prof. Günter Reiter (FREIBURG, Germany), Prof. Peter Rättö (RISE, Sweden)

2/ Project FREIBURG: Polysulfide Crystallization in a Nanoscale Environment and During Latex Film formation

PhD objectives: Elucidation of crystallization of polysulfide polymer in nanoconfining environments and during the film formation process. Development of anticorrosive coatings by optimizing crystallization conditions during film formation.

Location: Institute of Physics, Albert Ludwig University Freiburg (FREIBURG, Germany)

Principal investigator: Prof. Günter Reiter, Dr. Thomas Pfohl (FREIBURG, Germany)

Collaborators: Prof. Radmila Tomovska (POLYMAT, Spain), Prof. Peter Rättö (RISE, Sweden)