Marie Skłodowska-Curie fellowship in the field of polymer chemistry

The **SMART** Innovative Training Network (ITN) is recruiting 15 motivated PhD students starting in March 2020. **SMART** is a joint venture between academia and industry, providing scientific and personal development of young researchers in the multidisciplinary fields of soft robotics and smart materials. The fellowships are funded as part of the Marie Skłodowska-Curie Actions (MSCA) Innovative Training Networks under the European Commission's H2020 programme. The successful candidates will be hosted at leading international universities, research centres and companies. They will contribute to the project "**S**oft, **S**elf-responsive, Smart **MA**terials for **R**obo**T**s" as early stage researchers (ESRs) with the possibility to write a PhD thesis within the 3 years project duration.

The Physical Chemistry and Polymer Science (FYSC) research group from the Vrije Universiteit Brussel has extensive expertise in understanding the relationships between the properties of materials and their chemical structure and how the processing thereof affects the former. This knowledge is gained from and applied in both strategic research in close collaboration with a wide variety of industries, and fundamental research to gain an in-depth understanding of how the properties of advanced material systems can be improved for a.o. coatings, energy materials, intelligent material systems for robotics, green(er) chemistries and non-traditional cements.

As of **March 1st** 2020 the following Marie Skłodowska Curie fellowship (ESR 8) will be assigned:

Dynamic covalent polymer network properties by design for additive manufacturing of self-healing materials

Project description

Polymer network design (by means of building block and network architecture, chemistry, functionality and concentration) for the optimization of the viscoelastic and thermomechanical properties (i.e.: gel transition, viscosity and flow behaviour, cross-link density and moduli) will be vital for successful additive manufacturing of soft devices with stimuli-responsive materials and for their resulting performance. Through experimentation, modelling and simulations the material properties will be linked to the material's microstructure, architecture and chemistry to allow facile and fast predictions of a material's performance without the need for synthesis, reducing time consuming, costly steps in the material's development. Synthesized building blocks, network materials and printed objects will be characterized using thermal analysis, calorimetry and mechanical testing.

The aim of the project is to obtain:

- Relations between the chemical network structure and mechanical and viscoelastic behaviour
- Effect of advanced processing and manufacturing techniques on the material properties
- Microstructure formation and downsizing designed property anisotropy
- Study of the triggered behaviour and adaptation of the material properties in response
- Apply the stimuli-responsive material in soft robotic demonstrators for proof of concept

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Your profile

- ✓ *Be early-stage researchers (ESR). ESRs are those who are, at the time of recruitment by the host, in the first four years (full-time equivalent) of their research careers. This is measured from the date when they obtained the degree which formally entitles them to embark on a doctorate.*
- ✓ *Compliance with the mobility rules laid out in the MSCA ITN guidelines: At the time of recruitment, candidates **must not have legally resided or have had their main activity** in the country of their host organization for more than 12 months in the last 3 years immediately prior to their recruitment.*
- ✓ *Willingness to move countries for ESR placement and temporary secondments.*
- ✓ *Completed degree (Mag., Dipl.-Ing. or MSc.) (or obtaining a diploma before 15/10/2020) in the field of natural science or engineering.*
- ✓ *Profound knowledge in polymer chemistry.*
- ✓ *Fluent in English: Network fellows (ESRs) must demonstrate that their ability to understand and express themselves in both written and spoken English is sufficiently high for them to derive the full benefit from the network training.*
- ✓ *Advanced knowledge of MS Office mathematical and communication tools or equivalent.*
- ✓ *Personal initiative, reliable, responsibility, teamwork and communication skills*

We provide

- ✓ *Advanced research in a multi-disciplinary team*
- ✓ *Excellent contacts to industry as well as to national and international research organizations*
- ✓ *Additional educational program involving training schools, workshops and summer schools*
- ✓ *Flexible working hours, 40 h per week*
- ✓ *Possibility to perform a PhD in Engineering at the Vrije Universiteit Brussel*

Salary

The successful candidates will receive an attractive salary in accordance with the MSCA regulations for Early Stage Researchers (http://ec.europa.eu/research/mariecurieactions/) in the form of a scholarship. The exact salary will be confirmed upon appointment and is dependent on the country correction factor (to allow for the difference in cost of living in different EU Member States). The salary includes a living allowance, a mobility allowance and a family allowance (if already married). The guaranteed PhD funding is for 36 months.

Application

Please apply till **30/4/2020** according to the instructions on project website
http://www.smartitn.eu/recruitment/

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