

**Laboratoire d'Ingénierie des Matériaux Polymères**  
**IMP, UMR CNRS 5223**  
Université Jean Monnet  
Campus Métare  
23 RUE Dr Paul Michelon  
42023 SAINT-ETIENNE (FRANCE)



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## **Postdoctoral position (12 Months)**

### ***Synthesis and physical-chemical characterization of bio-sourced microgels***

**Research project:** Recently, many research works have been carried on the valorization of biopolymers derived from biomass such as polysaccharides to provide sustainable alternatives to fossil-based synthetic polymers. The cross-linking of the polysaccharides is a chemical transformation that is widely used to form a network by covalent bridging of the biopolymer chains, so called bio-gel. In water, highly hydrophilic cross-linked macroscopic gels can be formed to control the texturing properties of formulated products of everyday life. However, the irreversibility of this chemical modification does not allow processing of these products after synthesis as these gels cannot flow under shear. A more convenient way to proceed would be to carry out the cross-linking reaction in a dispersed medium to form individual micro-network, also called microgels.

The aim of this project is to synthesize microgels based on polysaccharides using sustainable chemistry and with keeping control of their microstructure. Then, their structural and rheological properties in water will be widely investigated. The physical-chemical behavior of these bio-sourced soft colloids will be analyzed according to theoretical models, and compared with non-renewable homologous systems to target some potential industrial application.

This project will be implemented within the laboratory d'Ingénierie des Matériaux Polymères (IMP, UMR CNRS 5223). The IMP team is renowned for his research activities in polymer science, with important facilities. Its main research aim is to establish and control relationships between chemistry, structure, rheology and processing. The candidate will have the opportunity to collaborate with international partners' lab in this project. The involved labs are the groups of Dr. Wuge Briscoe and Prof. Carmen Galan at the University of Bristol (UK), and the group of Prof. Richard Venditti from the State University of North Carolina (USA), for the systems synthesis, and the FORTH-IESL at Heraklion (Greece) with Dr. Benoit Loppinet and Prof. Dimitris Vlassopoulos, for the structural characterization using static and dynamic light scattering experiment.

**Candidate profile:** PhD in the field of polymer science, with a strong experimental background in polymer chemistry. Experiences in emulsion and disperse media will be appreciate. Knowledge or/and motivation to develop skill in physical-chemical characterization, especially in rheology and scattering technique. Excellent writing and oral communication skills. International mobility.

**Duration:** 12-months contract

**Starting date:** from April 2018 (possibility to start in October 2018)

**Salary:** 32700 € annual gross

**Location:** Saint-Etienne, France

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