ESPCI PARIS

Postdoctoral Researcher in the soft Soft Matter and Chemistry Laboratory (ESPCI)

https://wwwdev.espci.fr/fr/espci-paris-psl/emploi/2016/postdoctoral-researcher-in-the-soft-soft-matter-and

Laboratory Description :

ESPCI ParisTech is a major institution of higher education (a French "Grande École d'ingénieurs"), an internationally renowned research center (17 laboratories), and a fertile ground of innovation for industry. Teaching and research are in the fields of physics, chemistry and biology. The Soft Matter and Chemistry laboratory mainly focuses on the design, synthesis and study of polymeric and supramolecular materials. The laboratory is known for conducting fundament research inspired by or oriented towards industrial applications.

Project Description :

A novel class of materials, coined vitrimers, has recently been discovered in the laboratory. Vitrimers are unique networks capable of reorganizing themselves without altering their crosslinking density. These novel materials go from the liquid to the solid state or vice versa, yet they are insoluble. Most importantly, vitrimers are reshapeable at will and can be repaired and recycled under the action of heat.1-3 This property means that they can undergo transformations using methods that cannot be envisaged either for thermosetting resins or for conventional plastic materials. The first vitrimer materials developed in the laboratory were epoxy networks whose unique processing and recycling properties were relying on transesterification reactions. In order to extend the concept of vitrimers to a broader range of polymer matrices as well as to optimize processing and recycling conditions of these materials, the Soft Matter and Chemistry Laboratory is developing and testing new dynamic covalent reactions compatible with vitrimer technology. The goal of this project is to optimize the synthesis of the next generation of vitrimers as well as to perform in depth material characterization (chemical : NMR, IR, SEC,... ; physical and mechanical : rheology, DMA, tractions,...). The healibility and recyclability of the material will also be tested according to procedures recently developed in the laboratory. Studies and optimization of the processability of the materials will also be conducted.

Knowledges and Skills :

A polyvalent profile at the interface of polymer chemistry and material science is sought. Experience and experimental skills in polymer synthesis and/or material characterization will be real assets.

Recruitment terms :

Principal Investigators : Ludwik Leibler and Renaud Nicolaÿ Starting date : February 2016 Duration : one year (with a second year optional) Salary : The salary will be adjusted for candidates with outstanding background and expertise.

Contact

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Access

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