

PhD position at IMP laboratory, INSA de Lyon, France.

Design of Light-Adaptive Supramolecular Materials

This PhD project will address the development of light-sensitive supramolecular complexes and their integration into macromolecular systems to achieve adaptive materials. The rationale of this project will lie in the design of photoswitches with light-responsive binding capabilities. These building blocks will be synthesized in order to promote/inhibit the supramolecular association upon exposure to light.

The associative photoswitches will be then inserted as chain ends or pendant units into precisely defined polymer chains. After preliminary evaluation of their light-sensitive character and binding capabilities, these macromolecular building blocks will be engaged into the preparation of a panel of photo-responsive materials (organo or hydro)gels, self-assembling colloids or in the construction of nanocomposites. Owing to the insertion of the photoswitchable units, the association/dissociation of the supramolecular complexes will promote gel/sol (gels), aggregation/dissociation (colloids), stiff/tough transitions (nanocomposites) under irradiation. As the generation of associative photoswitches and the understanding of their supramolecular association/photoisomerization/macroscopic mechanical properties has never been addressed so far, the envisioned results will constitute a major advance in the fields of supramolecular chemistry and adaptive materials.

Keywords: *Organic and supramolecular chemistry, macromolecular engineering, adaptive materials.*

Requirements: We are looking for an ambitious, **highly motivated** and hard-working PhD applicant. The ideal candidate should have a Master degree in chemistry, with a **strong background in organic/supramolecular chemistry**. Minimal hands-on experience in **polymer chemistry** is highly recommended. She/he should have experience with analytical methods (NMR, UV-Vis, IR, fluorescence spectroscopies, and chromatographic techniques such as SEC). Other skills, such as knowledge about ITC, DLS and microscopy techniques will also be appreciated.

An **excellent level in english language** is required. French language knowledge is welcome but not mandatory.

Interested candidates should contact Dr Julien Bernard (CNRS researcher, julien.bernard@insa-lyon.fr) or Dr Stéphane Chambert (Associate Professor, stephane.chambert@insa-lyon.fr) and provide a detailed CV including research experience and list of publications, a motivation letter, and contact details or recommendation letters of at least two academic referees.