



Opening position at the **Laboratoire Léon-Brillouin**  
(CEA Saclay, France) for a  
**18 month POST-DOCTORAL FELLOWSHIP**  
monthly gross income 3400-3600 €

**Structural characterization of inorganic-metallic coacervates obtained from complexation of metallic nanoparticles stabilized by polymerized Ionic Liquids and polyanions**

**Research** The overall objective of the project is the design of a new class of highly active, selective and recyclable porous nano-catalysts thanks to a strategy based on the non-covalent electrostatic complexation of metallic nanoparticles (MNPs) of catalytic interest stabilized by cationic polymerized ionic liquids (PILs) with polyanions to build 3D heterogeneous networks with unprecedented catalytic properties.

Preliminary results have shown that ruthenium nanoclusters stabilized in aqueous solution by a corona of cationic PILs (Ru@PIL(+)) do form coacervates upon complexation with anionic polyelectrolytes. The recruited candidate will be in charge of the structural description of this system at multi-length scales to establish structure/property relationships. This will include: (i) in a first time the fine characterization of the individual Ru@PIL(+) as function of chosen PILs, including their organization in solution, the structure of PIL corona, and spatial distribution of their counter-anions, (ii) the internal local structure of the coacervates. The main structural tool will be the Small angle scattering (SAS) by coupling X-rays (SAXS) and neutrons (SANS), using the full experimental range of possibilities offered by the technique (contrast variation in SANS or SAXS by anomalous measurements, time-resolved experiments with a stopped-flow setup), in combination with others techniques such as TEM, DLS or zeta-potential measurements.

**Context** The project is funded by the Agence Nationale de la Recherche in France for 18 months. The work will be performed at the Laboratoire Léon-Brillouin in Saclay (close to Paris), in strong collaboration with Joan Vignolle and Christophe Schatz (LCPO Bordeaux) and Rosa Axet (LCC Toulouse). Motivated candidates should have a solid expertise in physics of soft matter and scattering techniques (light, x-ray, neutrons).

If prospective applicants would like to discuss the post informally, please contact:

Dr. Fabrice Cousin ([fabrice.cousin@cea.fr](mailto:fabrice.cousin@cea.fr))

Dr. Alexis Chennevière ([alexis.chenneviere@cea.fr](mailto:alexis.chenneviere@cea.fr))

**Send applications to above emails, include CV with names and addresses of two referees /  
motivation letter required**

**Laboratoire Léon Brillouin**

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