



**Opening position at Université de Paris  
Laboratoire Matière et Systèmes Complexes  
24 months POST-DOCTORAL FELLOWSHIP**

**Motorized Nanostructures from Light-responsive Molecular Machines:  
Structure and Dynamics**

**Positioning:**

The main objective of the project is to design and effectively actuate an entirely new class of mechanically active nanostructures functionalized with light-driven rotary molecular motors and helical propellers. In this challenging approach, we will focus on the out-of-equilibrium mechanical properties of these nano-objects in order to understand in details their dynamics upon motor rotation, and to control their changes in size, shape, and directed propulsion behavior. The entire project will be achieved by a unique multidisciplinary consortium that consists of a combination of synthetic chemists, experimental physicists, and theoreticians (ICS Strasbourg and MSC Paris).

**Post-doctoral position:**

- The postdoctoral position is funded from the Agence Nationale de la Recherche (ideally starting in September 2021 but the start date is very flexible depending on the situation of the candidate). The salary range is defined by the Université de Paris and depends on the experience of the candidate. The work will be performed at the Matière et Systèmes Complexes laboratory (Université de Paris).
- The propulsion and diffusion properties of the self-propelling molecular machines and motorized nanostructures (e.g. Janus nanoparticles, vesicular self-assemblies, surfactant nanodisks) will be fully characterized by using in particular scattering techniques (light, X-ray, and neutron) and heterodyne dynamic light scattering under UV irradiation allowing to tune and determine the balance between diffusive and ballistic motions. The impact of the project will be threefold: i) to demonstrate that artificial molecular motors can transfer their mechanical work to the nanostructures in which they are integrated; ii) to generate smart nanostructures capable of transient adaptation to their environment; and iii) to achieve the world-smallest propellers to date with potential long-term applications in nanotechnologies and nanomedicine.
- The successful post-doctoral fellow will interact closely with university and ANR collaborators (groups of N. Giuseppone, C. Serra, and A. Semenov): University of Strasbourg, Large Facilities.

**Requirements:**

- A recent Ph.D. or Postdoc. Degree in Physics, Physical-Chemistry, Soft Matter, Polymer Science, Complex Systems, Biophysics, Colloids or other closely related field.
- An expertise in scattering would be appreciated: Light Scattering (e.g. Homodyne, Heterodyne, Static, Dynamics, Cross-correlation, DWS...) and/or Small-Angle Neutron or X-ray Scattering, etc.

**Applications:**

Applicants should submit detailed curriculum vitae with a list of publications, and the names, emails, and addresses of professional references to:

Prof. Eric BUHLER (phone: +33 1 57 27 61 39)  
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