



POSTDOCTORAL RESEARCH FUNDING

Monthly gross income: 3000 €

18 months (extendable to 2 years) – Starting date: 04/05/2026 or earlier

CEISAM - UMR CNRS 6230 / NANTES UNIVERSITY - FRANCE

COUPLING PHOTOCHROMES FOR ULTRAFAST TUNING OF MAGNETIC NANOPARTICLES

Context. The CEISAM lab seeks talented and motivated scientists to conduct research works in the field of photomagnetic nanomaterials, driving considerable interest in data storage, catalysis and nanomedicine. While numerous studies have been carried out in the stationary states, deciphering at short ns and sub-ns timescale the impact of light on the magnetic properties and conversely, how magnetic switching can influence the dynamics of photoexcited states, would bring considerable progress in the design of performing materials.

Research studies. The goal of the project is to design, elaborate and investigate hybrid nanoassemblies, composed of photochromic molecules in tight interactions with iron oxide superparamagnetic nanoparticles. Particular attention will be devoted to the size control of nano-objects by resorting to microfluidic synthesis, allowing for additional post-processing, like surface functionalization. This work will be carried out in the framework of the research project CLAMP, funded by the national program PEPR LUMA, addressing high-level challenges in light-matter interactions. It will involve strong collaborations with chemists in Sorbonne University (PHENIX), photophysicists at ENS Paris, physicists in Strasbourg University (IPCMS) and Perpignan University (PROMES), respectively expert in nanomagnetism and magnetic nanoparticles, ultrafast spectroscopic studies, ultrafast spin dynamics and theory of heat and optical coupling in magnetic nanoparticles and nanoassemblies.

Locations. Our team is more specialist in the design, manufacturing and studies of photoresponsive molecules and nanoassemblies. The lab is equipped with all common organic synthesis facilities and photophysical setups (steady-state and time-resolved absorption and emission spectroscopies, fluorescence microscopy) and has straightforward access to nanomaterial characterizations (TEM, AFM, DLS, zetametry). It will bring the candidate to work in a very dynamic scientific atmosphere, embracing energy and biology challenges, at the crossroad of molecular synthesis, photosciences, (nano)materials science and magnetism.

Skills. The recruited candidate is thus expected to possess a strong working-together spirit, be open-minded and ready for interdisciplinarity, and have solid background in functional organic materials.

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Application will first proceed by e-mail by sending a detailed CV and contact names.

Keywords: photoactive molecules, hybrid nanomaterials, photochemistry and photophysics, magnetism, hyperthermia.

References.

F. Zizzi et al., *ACS Appl. Nano Mater.* **2025**, *8*, 24412; E. Bequet et al., *Small* **2024**, *20*, 2403912; J. Boucard et al., *ACS Appl. Mater. Int.* **2019**, *11*, 32808; F. Rodriguez et al., *Adv. Opt. Mater.* **2021**, *9*, 2100525; T. Briolay et al., *Int. J. Nanomedicine* **2024**, *19*, 633; T. Blondy et al. *Nanoscale* **2022**, *14*, 5884; S. Hoang et al., *ChemPhysChem* **2020**, *21*, 2502.