



## PhD in CHEMISTRY – NANOMATERIALS FOR OPTICAL DATA STORAGE

**3 year-duration – Funding from October 1st, 2018**  
**DEADLINE OF APPLICATION : 18<sup>th</sup> APRIL 2018**  
(link UBL : <https://theses.u-bretagne Loire.fr/>)

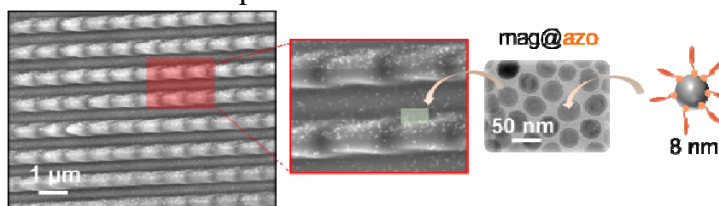
**Laboratory:** [CEISAM](#) – UMR CNRS 6230 / [IMN](#) – UMR CNRS 6502 / Nantes University

**Project title:** PHOTOSWITCHABLE MAGNETIC NANOARCHITECTURES

**PhD supervision:** Supervisor: ISHOW Eléna, [elena.ishow@univ-nantes.fr](mailto:elena.ishow@univ-nantes.fr), 02.51.12.53  
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**Funding:** Co-funding DGA (awarded)

**Research project:** The research studies developed in partnership with the French General Delegation of the Armament (DGA) will tackle the fabrication of organized structures based on magnetic nanoparticles, stirring considerable attraction in the fields of energy, information transfer and data storage. In order to overpass the limitations related to the weak density, the poor modularity and the large micrometer dimensions of the nanoparticle patterns, two research teams of chemists (CEISAM-UMR 6230) and physicists (IMN-UMR CNRS 6502) of Nantes University will work in a tight together manner and share their long expertise in the fabrication and characterizations of photo- and magneto-active nanomaterials. They propose a disruptive strategy involving a remote and solvent-free patterning procedure, soundly differing from the usual self-assembling and stamping methods. Such innovative approach will advantageously involve holographic structuration of photochromic sub-micrometric thin films, doped with magnetic nanoparticles and amenable to induce periodic mass transfer under interferential illumination. By combining orthogonal stimuli (static magnetic, optical field) and devising bicomponent systems comprising nanoparticles with distinct magnetic properties, novel perspectives in the field of multifunctional smart structures will be explored.



This interdisciplinary project will provide the PhD candidate with strong knowledge and expertise in nanomaterials chemistry and physics (from synthesis of hybrid nanomaterials to structural characterizations), physico-chemical investigations (photophysics, magnetism measurements), optical, electronic and near-field microscopy (especially AFM). It will request high motivation, an open-minded spirit supported by a solid background in materials science and physical chemistry.

**Application will first proceed by e-mail by sending a detailed CV, records of the master and bachelor degrees (or Engineer School), two letters of recommendation, or two names of possible referees. Application is strictly restricted to citizens from E.U. or Switzerland.**