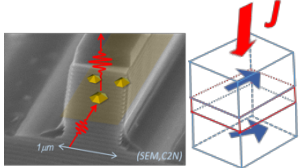


## M2 – SMNO-Nanomat – OptoSpin

<b>Title:</b>	<b>Nanostructures for Optoelectronics and Spintronics (OptoSpin)</b>	
	<b>Apogée code:</b> MU5PYM09 <b>Number of credits:</b> 6 <b>Teaching hours:</b> 36h courses, 14h tutorial or project	

<b>Lecturers:</b>	Valia VOLIOTIS (coordinator) INSP – 22-32 – 208 valia.voliotis@insp.jussieu.fr	Agnès BARTHELEMY CNRS-Thalès agnes.barthelemy@cnsr-thales.fr	Laura THEVENARD INSP – 22-23 – 206 laura.thevenard@insp.jussieu.fr
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<b>Objective</b>	The main goal of this course is to provide the basic concepts to understand optical and magnetic properties of nanostructures based on semiconductor and ferromagnetic materials and their applications to modern optoelectronics and spintronics.
<b>Content</b>	<ol style="list-style-type: none"> <li>Optical properties of semiconductor nanostructures (quantum wells, wires and dots): light-matter interaction; absorption, spontaneous and stimulated emission; excitons, polaritons; applications to optical modulators, lasers, light emitting diodes.</li> <li>Magnetism of nanostructures: anisotropy, <math>T_c</math>, magnetic domain-walls and domains; Spin polarized transport, GMR, TMR, STT, spin-orbitronics; magnetisation dynamics, magnetic resonance, spin waves, magnons.</li> <li>Bibliographic projects</li> <li>The course is correlated to practical works which we strongly recommend: Luminescence and Stark effect in quantum wells; Magneto-optical observation of magnetic domains; Micromagnetic simulations.</li> </ol>
<b>Prerequisites</b>	We strongly recommend that the students take the course of Condensed Matter Physics 2. Otherwise, they must have a background in semiconductor physics (band structure, perturbative $k.p$ method) and in the general concepts of magnetism (ferro- and para-magnetism, magnetic anisotropy and Curie temperature) Quantum mechanics; Quantum statistical physics
<b>Examination</b>	Written examination Bibliographic project oral defense