



## INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

### INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	LPICM (Laboratoire de Physique des Interfaces et des Couches Minces)
Website of the Host Laboratory	<a href="http://www.lpicm.polytechnique.fr">www.lpicm.polytechnique.fr</a>
Research Group	Applied Optics and Polarimetry (nanoRaman team)
Internship Supervisor	R. Ossikovski
Internship Subject	Near-field Raman spectroscopy and applications to nanotechnology
Student's level	<input checked="" type="checkbox"/> Advanced Undergraduate Students (3 <sup>rd</sup> or 4 <sup>th</sup> year) <input checked="" type="checkbox"/> Master's students (1 <sup>st</sup> or 2 <sup>nd</sup> year) <input type="checkbox"/> PhD students
Proposed Duration	<input checked="" type="checkbox"/> 3 months <input type="checkbox"/> 4 months <input type="checkbox"/> 5 months <input type="checkbox"/> 6 months
Prerequisites	Basics of solid state physics and general optics; hands on working experience
Internship description (max. 15 lines)	<p>The extremely rapid development of nanotechnologies we are witnessing nowadays is not only focused on the elaboration and on the applications of nanoobjects and nanostructures, but also requires the availability of advances optical tools to characterize these structures at the nanometer scale. Near-field Raman spectroscopy (also, TERS or nano-Raman) is such a nanocharacterization technique: by combining Raman spectroscopy with scanning probe microscopy (SPM), it makes possible the accurate chemical and structural analysis of the sample with a nanometer spatial resolution. The trainee will be involved with the current activities of the nano-Raman team which include, most generally, both instrumentation and characterization aspects. The instrumentation work comprises the improvement of the performance of the current setup, including the production and testing of near-field probes. The characterization part concerns the advances chemical analysis of self-assembled monolayers (SAMs) for organic electronics applications, as well as the nanoresolved measurement of strain in silicon nanostructures for the semiconductor industry. Aptitude and motivation for experimental work with a strong applied physics bias are expected from the applicant.</p>