



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	www.lpicm.polytechnique.fr
Research Group	Applied Optics and Polarimetry (AOP)
Internship Supervisor	R. Ossikovski
Internship Subject	Design of a Mueller matrix microscope
Student's level	<input type="checkbox"/> Advanced Undergraduate Students (3 rd or 4 th year) <input checked="" type="checkbox"/> Master's students (1 st or 2 nd year) <input type="checkbox"/> PhD students
Proposed Duration	<input type="checkbox"/> 3 months <input checked="" type="checkbox"/> 4 months <input type="checkbox"/> 5 months <input type="checkbox"/> 6 months
Prerequisites	Basics of optics and programming; hands-on experience
Internship description (max. 15 lines)	<p>Attacking main challenges of modern medicine, such as early cancer detection, demands the use of novel, breakthrough optical characterization techniques and methods. To address the ever-enlarging biomedical field, in particular, digital histology, the AOP team of LPICM is currently building a multi-wavelength Mueller matrix microscope operated in both elastic scattering and fluorescence modes. More specifically, the future optical equipment will quantify the interaction of polarized light with the (biomedical) sample, providing an output in the form of a measured Mueller matrix. Its principle of operation resides in the use of liquid- crystal-based optical components (retarders). The AOP team of LPICM has a largely recognized experience in building polarized light instrumentation that will be put to profit in this challenging project.</p> <p>The trainee will be involved with the instrumentation part of this project, at some or at all of its stages: optical design, mechanical construction, alignment, driving optical components through dedicated electronic boards, data acquisition and pre-processing. Besides design itself, testing and validation of the instrument also represent significant parts of the project. The specific aspect the trainee will be tackling will depend on his previous knowledge, experience and personal preferences. Aptitude and motivation for experimental work with a strong applied physics bias are expected from the applicant.</p>