



INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	LadHyX
Website of the Host Laboratory	https://www.ladhyx.polytechnique.fr/fr/
Research Group	
Internship Supervisor	Camille Duprat
Internship Subject	Capturing droplets with fibers
Student's level	<input checked="" 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 checked="" type="checkbox"/> 3 months <input checked="" type="checkbox"/> 4 months <input checked="" type="checkbox"/> 5 months <input checked="" type="checkbox"/> 6 months
Prerequisites	background in fluid mechanics and soft matter, a great interest in experimental work.
Internship description (max. 15 lines)	<p>The impact of droplets suspended in a gaz or liquid stream (aerosol/emulsion) on an entangled fiber mat is ubiquitous in various industrial processes, from the filtration of aerosol to the fabrication of wool fiber mats. We have previously studied, both experimentally and theoretically, the capture of liquid droplets on a simple model filter composed of parallel vertical fibres. In particular, we have characterized and described the distribution of droplets on the fibers with a growth-coalescence process. When the fibers are entangled, fiber crossings will affect both the flow within the fiber mat and the resulting distribution of liquid. If the fibers are flexible, they may also deform when in contact with drops (so called elastocapillarity). We propose to study the impact of aerosol droplets and the resulting drop distribution on fibrous assemblies of various geometries, with a particular attention on drops at fiber crossings or between flexible fibers. The internship will be mostly experimental, and is part of a collaboration with Saint-Gobain Recherche Paris.</p>