



INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	LadHyX
Website of the Host Laboratory	https://www.ladhyx.polytechnique.fr/en/ecoulements-microscopiques
Research Group	Microscopic flows
Internship Supervisor	Camille Duprat, Gabriel Amselem, Blaise Delmotte
Internship Subject	Transport and deformation of a flexible fiber around obstacles
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 / Taste for experiments / Basic programming skills
Internship description (max. 15 lines)	<p>The transport of elastic particles at the micron-scale often happens in complex media that are structured by obstacles whose size is similar to the size of the moving particles. For example, structured environments, such as soils, medical stents or capillaries, promote the formation of large elastic filaments of bacterial biofilms, called streamers, that can detach in the form of big elastic clumps of hundreds of microns to migrate with the flow in crowded microchannels which results to spread in secondary sites or clogging of small vessels leading to strokes. Flowing elastic objects through obstacles can be used to sort particles or biological objects in microfluidic systems.</p> <p>In this regime, which covers a broad range of applications, the dynamics of flexible objects results from the complex interplay between the external flow, internal elastic stresses, contact forces and hydrodynamic interactions with the walls and the embedded obstacles.</p> <p>In this internship, we will tackle this problem using a simple experimental system (a single fibre colliding with an obstacle). The intern will collaborate closely with other lab members working with numerical simulations in order to compare and rationalize her/his experimental results.</p>

The boxes marked with cross implies eligible