**INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS**

**INTERNSHIP SUBJECT FORM**

<table>
<thead>
<tr>
<th>Name of the Host Laboratory</th>
<th>LadHyX</th>
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<tbody>
<tr>
<td>Website of the Host Laboratory</td>
<td><a href="https://www.ladhyx.polytechnique.fr/en/">https://www.ladhyx.polytechnique.fr/en/</a></td>
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<td>Research Group</td>
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<tr>
<td>Internship Supervisor</td>
<td>Gabriel Amselem</td>
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<tr>
<td>Internship Subject</td>
<td>Membrane fluctuations and motion due to swimming microorganisms</td>
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<td>Student’s level</td>
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- Advanced Undergraduate Students (3rd or 4th year)  
- Master's students (1st or 2nd year)  
- PhD students |
| Proposed Duration |  
- 3 months  
- 4 months  
- 5 months  
- 6 months |
| Prerequisites | A strong taste for experimental work and image analysis |
| Internship description (max. 15 lines) | Swimming microorganisms such as micro-algae or bacteria can be seen as self-propelled particles that undergo a random motion, very much like atoms do. Unlike atoms though, swimming microorganisms have a tendency to accumulate at walls, and this accumulation depends on the curvature on the wall. At the same time, microorganisms exert a force on the wall, which tends to deform it and can enhance accumulation. In this internship, we will use microfluidic tools to study the interaction between a (deformable) lipid membrane and the model swimming microalgae *Chlamydomonas reinhardtii*. We expect to observe very large deformations of the membrane, as observed with active particles at the macroscopic scale e.g. in [1,2]. We can then quantify these deformations and try to link them to existing models of active matter. The internship is experimental, with a good amount of image analysis involved. |


The boxes marked with cross implies eligible