



INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	Laboratoire de Physique de la Matière Condensée (PMC)
Website of the Host Laboratory	https://pmc.polytechnique.fr
Research Group	Physique de l'irrégularité
Internship Supervisor	Thomas Philippe (CNRS researcher)
Internship Subject	Modelling nanowire growth with the phase-field crystal method
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 checked="" 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	C++ (and CUDA but it is not mandatory), notions of thermodynamics and material science
Internship description (max. 15 lines)	<p>We propose to model semiconductor nanowire (NW) growth with the phase-field crystal method (PFC). The vapor-liquid-solid (VLS) mechanism is the most common method to grow semiconductor NWs, that show great promise for many applications in nanoelectronics, photovoltaics or optoelectronics, to name a few... Control over the size, composition and morphology of the NWs is essential to design efficient devices, and a better understanding of the process is required. We plan to develop the PFC approach; so that to ultimately model this technologically important process at the atomic scale and on the same time scale as experiments. It is anticipated that this work reveals new growth mechanisms at the ultimate scale.</p> <p>The student will participate in the numerical implementation (GPU computing) of an existing PFC model that will be applied to nanowire growth. Preliminary results are very promising.</p>

The boxes marked with cross implies eligible