



INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	Laboratoire Leprince Ringuet
Website of the Host Laboratory	http://lir.in2p3.fr/
Research Group	CMS
Internship Supervisor	Matthew Nguyen
Internship Subject	Probing the Quark-Gluon Plasma with jets using the CMS experiment at the CERN-LHC
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	Working English, basic programming knowledge
Internship description (max. 15 lines)	<p>Collisions of heavy nuclei at the Large Hadron Collider are used to heat matter to extreme temperatures. In these conditions, a phase transition takes place, such that ordinary nuclear matter becomes a deconfined state of strong interacting particles known as the quark-gluon plasma. One of the best ways to study this novel state of matter, which permeated the early universe, is to look at the attenuation of energetic particles as they emerge from the quark-gluon plasma. This is achieved through via measurement of jets, clusters of hadrons from which the kinematics of hard-scattered quarks and gluons may be inferred. During the internship, the student will perform a feasibility study of a measurement of jets initiated by heavy quarks from the decay of a Z boson in heavy-ion collisions. The internship is proposed in view of a PhD thesis project to start in the fall of 2021, which will be based on data to be recorded in 2022. The student will be expected to spend some fraction of their time at CERN. The PhD thesis is financed by a grant from the European Research Council.</p>

The boxes marked with cross implies eligible