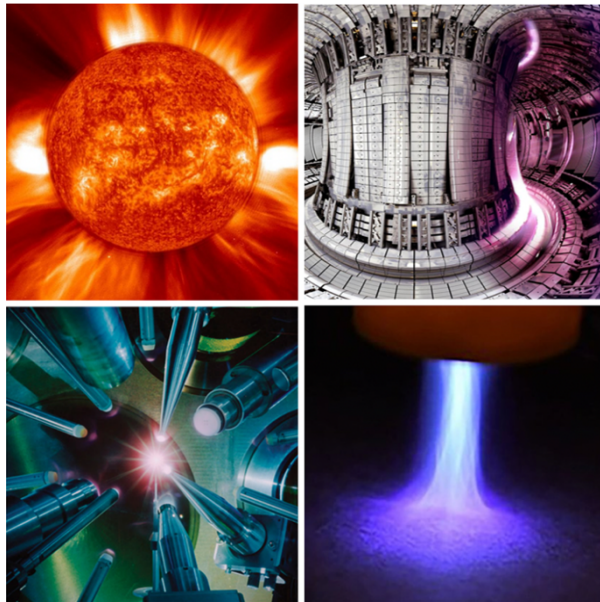


Title : Instrumentation, diagnosis and analysis of plasmas	
Acronym : TC6	
EU Coordinator : Thierry DUFOUR, Laboratoire de Physique des Plasmas (LPP)	
Teaching staff :Thierry DUFOUR, Gabi Daniel STANCU, Fouad SAHRAOUI	
Pre-requisites : First year of MSc in Physics or Engineering Schools.	
Credits : 3 ECTS	
Language : French/English	
Keywords : metrology & sensors, vacuum techniques, gas flow techniques, Langmuir probes, signal processing, mass spectrometry, optical emission/absorption spectroscopy, plasma diagnostics.	
<p>The objective of the course is to introduce students to the techniques of characterization, diagnosis and analysis of plasmas used in physics research laboratories. They can thus benefit from the expertise of internationally recognized researchers, professors, engineers and astronomers, who welcome them in their laboratories for several days of "Practical Work" organized within their research team.</p> <p>The subjects proposed by the laboratories concern all types of plasmas (cold process plasmas, thermonuclear magnetic fusion plasmas, inertial fusion plasmas, natural and astrophysical plasmas). The practical work is very varied: instrumentation, experimental</p>	
<p>measurements on a research device, analysis of space data from a satellite, numerical modeling, use of calculation codes, etc...</p> <p>Before these practical works, a theoretical course of 18 hours is given on the techniques of instrumentation, diagnosis and analysis of plasmas. Particular emphasis is placed on vacuum and gas flow techniques, but also on electrical diagnostics (Langmuir probes, ...), spectrometry diagnostics (OES, MS) and laser diagnostics (LIF, TALIF, ...).</p>	<p><i>The Sun observed by a space satellite, Interior view of a Tokamak, Inertial laser fusion, Cold plasma jet</i></p>
<p><u>List of the laboratory works proposed for the year 2020-2021</u></p> <ul style="list-style-type: none"> [1] UV spectroscopy of the solar corona [2] Turbulent magnetic field measurements in interplanetary space: spectral analysis [3] Tools for the visualization of data from natural plasmas [4] Imaging and spectroscopy of hot plasmas created by laser [5] Particle-In-Cell (PIC) kinetic simulation of plasmas [6] Inertial confinement fusion : numerical study of an implosion [7] Observation of instabilities in toroidal magnetized plasmas by Langmuir probes [8] Predator-prey oscillations in magnetically confined fusion plasmas [9] Electron density measurements in an inductive plasma using a resonant microwave probe [10] Study of the dynamics of an atmospheric plasma jet for biomedical applications [11] Cold plasmas processes for life sciences: application to agriculture 	