

4.0 credits	22.5 h	1q
-------------	--------	----

Teacher(s) :	Pierrard Viviane ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	<p>The main topics are:</p> <p>*The Sun:*</p> <p>Stars (formation, destruction, groups) - Description of the inner Sun (fusion, abundance of the elements, radiative, convective zones) The solar atmosphere solaire (photosphere, chromosphere, corona) - Sunspots, solar activity cycle Solar eruptions (CME, flares, proeminences ) - Coronal holes</p> <p>*Physics of gas and plasmas:*</p> <p>Definitions and properties Fundamental equations: kinetic and hydrodynamic approaches- Links and differences- Application: hydrostatic equilibrium</p> <p>*The solar wind*:</p> <p>Discovery Solar magnetic field - Observations: slow-speed and high-speed solar wind - Application of the fundamental equations for plasmas: hydrodynamic and kinetic equations</p> <p>*The magnetosphere*:</p> <p>Origin of the geomagnetic field - Description of the different regions of plasmas, currents - Magnetopause, polar cusps, plasmashet, plasmasphere, Van Allen belts</p> <p>*Movement of the particles in a magnetic field*:</p> <p>Decomposition in 3 superposed movements Drift forces - Application to the Van Allen belts</p> <p>*Sun-magnetosphere interactions*:</p> <p>Magnetic storms and substorms - Aurora Space weather - Indexes of geomagnetic activity</p> <p>*Ionosphere*:</p> <p>Sources of ionization - Ionospheric layers - Propagation of radio waves- Refraction index - Perturbations due to the solar activity - Influence on satellites and GPS</p> <p>*Neutral atmosphere*:</p> <p>Temperature profile - Troposphere, stratosphere, mesosphere, thermosphere, exosphere - Photodissociation, chemical reactions, ozone</p>

	<p>*Planetary atmospheres:*</p> <p>Mercury Venus Mars Giant planets**</p>
Aims :	<p>The goal of this formation is to give to the students an overview of the physical properties of the planetary and stellar atmospheres. The influence of the Sun on the terrestrial atmosphere and the space environment of</p> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods :	<p>Evaluation:</p> <p>The evaluation is obtained by a written exam. In addition, volunteer students can make an oral personal presentation on a topic concerning the physics of high atmosphere and space that will be counted as ¼ for the global evaluation.</p>
Teaching methods :	
Bibliography :	<p>Course materials:</p> <p>- Pierrard V., L'environnement spatial de la Terre, Presses Universitaires de Louvain, 214 p., 2010.</p>
Other infos :	<p>This formation is addressed to all physicists, engineers and geologists and is particularly useful for the students in physics of the Earth section. There are no specific preliminary needs.</p> <p>Support: notes are distributed at each lecture.</p> <p>Evaluation: the examination is prepared by written and is followed by an oral presentation.</p>
Cycle and year of study :	<p><a href="#">&gt; Master [120] in Physics</a></p>
Faculty or entity in charge:	<p>PHYS</p>