

Plasma Physics

Lecturers: Pascal André , Nicole Bastid, Régis Lefèvre, Sarah Porteboeuf.

Organization: 5 lectures

Aimed public: PhD student in physics

Summary:

The goal of this series of lectures is to give an overview of the Plasma Physics by addressing both the basic theoretical concepts and the experimental methods. The first part will be devoted to electromagnetic plasma with emphasis on electric arc and thermal plasmas, while the second part will be focused on quark-gluon plasma created in particle accelerators like the Large Hadron Collider (LHC) at the CERN Laboratory.

Part I – Electromagnetic Plasma

1. Basics of thermal plasmas
2. Thermodynamic equilibrium
3. Interaction potentials
4. Electric arc and thermal plasmas

Part II – Quark-Gluon Plasma

1. Basics of particle physics
2. Confinement of quarks and asymptotic freedom
3. Phase diagram of strong interaction
4. Experimental method: heavy ion collisions

Title of the lecturers:

“Basics of particle physics” by Régis Lefèvre

“Experiment method: heavy ion collisions” by Nicole Bastid

“Phase diagram of strong interaction” by Sarah Porteboeuf

“Basics of thermal plasmas” and “Electric arc and thermal plasmas” by Pascal André