Atomic Processes in Plasmas

Monday 15 May 2023 - Friday 19 May 2023

Vienna International Centre

Scientific Programme

Tutorials

Lectures and Computing Practicals providing training in theoretical methodologies and codes used in plasma physics.

Astrophysical Plasmas

Theoretical and experimental studies for refining understanding of astrophysical plasmas, such as modeling and experimental testing of relevant atomic processes, spectroscopy, radiation transport, opacity, emissivity, and equation-of-state.

Magnetic-Confinement Fusion Plasmas

Theory and experiment relating to atomic processes in edge and fusion plasmas, including collisional-radiative modelling, neutral beam interactions, spectroscopy and opacity.

Fundamental Data and Modelling

Atomic and molecular structure as well as collisional and radiative data are crucial to the understanding of the radiative properties of plasmas, and are of major interest in inertial confinement fusion, magnetized plasmas, X-ray sources, amongst other fields.

High Energy Density Plasmas and Powerful Light Sources

Studies on interaction of electrons, ions and radiation in plasmas produced by laboratory devices (lasers, pinches, etc) or astrophysical objects with energy densities greater than 100 GJ/m^3 including radiative transport, emissivity and opacity, atomic processes, spectroscopy, line-shapes and hydrodynamic behaviour.

Science and technology on plasma with pulsed-power driven experiments, high energy laser-driven experiments, ultra-high intense laser matter interaction experiments, next generation of ultra-high intensity laser experiments, and high intensity X-ray – matter interaction.

Research on matter in a regime that is found in planetary interiors, cool dense stars (brown dwarfs), and in states initiated from a solid, e.g. solid to plasma laser-matter interaction, dense plasma produced by X-ray, as well as all inertial fusion schemes.

Powerful Light Sources

Science and technology on plasma with pulsed-power driven experiments, high energy laser-driven experiments, ultra-high intense laser matter interaction experiments, next generation of ultra-high

intensity laser experiments, and high intensity X-ray – matter interaction.

Warm Dense Matter

Research on matter in a regime that is found in planetary interiors, cool dense stars (brown dwarfs), and in states initiated from a solid, e.g. solid to plasma laser-matter interaction, dense plasma produced by X-ray, as well as all inertial fusion schemes.

Atmospheric and Medical Plasmas

Research and applications of atmospheric-pressure plasmas, including to medicine, surface-treatment processes and manufacturing.