

AKjDPG 3: Tutorial Plasma Physics (joint session AKjDPG/P)

Time: Sunday 16:00–18:00

Location: a310

Tutorial AKjDPG 3.1 Sun 16:00 a310
Plasmas at atmospheric pressure: Overview on Physics and Applications — ●RONNY BRANDENBURG — Leibniz-Institut für Plasmaforschung und Technologie e.V., Greifswald, Germany — Universität Rostock, Rostock, Germany

Plasmas at atmospheric pressures gain more and more attention, both in research and industry. A variety of plasma sources exist and the applications span a wide spectrum from material processing and chemical conversion to surface treatment and therapeutic usage. Despite the wide use and application, there are still challenges from the fundamental point of view. These plasmas are often characterized by rapid gas breakdown, transient and erratic behaviour, and formation of instabilities.

The tutorial gives an introduction about plasmas at atmospheric pressure. The principles of plasma generation at elevated pressures, in particular the breakdown mechanisms will be explained in the first part of the tutorial.

Plasmas at atmospheric pressure span a wide range of types with

different parameters. The most general distinction is made between thermal and non-thermal plasmas. Both forms, its generation and the technological applications are explained.

Tutorial AKjDPG 3.2 Sun 17:00 a310
Introduction to High-Temperature Plasma Physics — ●OLO FUCHERT — Max-Planck-Institut für Plasmaphysik, Greifswald, Deutschland

Although not always noticed in daily life, plasmas are surprisingly common, both in the universe and in the lab. A plasma is essentially a "gas" of electrons and ions with no net charge to the outside. This gives rise to collective behavior and complex dynamics of particles. This is especially true in the presence of magnetic fields, as it is often found in astrophysical plasmas and in magnetically confined plasmas for fusion research. In this tutorial lecture, after introduction the basic characteristics of plasmas, we are going to look at common examples of high-temperature plasmas, theoretical methods to describe their dynamics and experimental methods to study them.