

AKjDPG 1: Tutorial Plasma Physics

Time: Sunday 16:00–17:40

Location: K 1.011

Tutorial AKjDPG 1.1 Sun 16:00 K 1.011
Introduction into physics of Wendelstein 7-X — ●SERGEY BOZHENKOV and W7-X TEAM — Max-Planck-Intitut für Plasma-physik, Greifswald, Germany

This tutorial will give an overview of active stellarator research topics, including an explanation of stellarator optimization, an introduction into the physics of Wendelstein 7-X (W7-X) and a thorough presentation of its experimental results so far. A high quality of magnetic flux surfaces necessary for confinement and compensation of remaining errors are demonstrated. The plasma initiation and heating to multi-keV temperatures are provided by electron cyclotron resonance heating with presently available power up to 7 MW. The power exhaust and the plasma wall interaction are defined by an island divertor with inertially cooled graphite targets, which already makes possible plasma operation with the heating power of 2 MW for 30 s. A good diagnostic coverage allows first tests of the W7-X optimization as well as, for example, first measurements of the plasma turbulence. In future, with adding more heating power and ion heating schemes, the program will also include studies of the MHD stability at high plasma pressures and confinement of fast ions. Installation of the water-cooled divertor targets will allow high power plasma discharges (10 MW) lasting up

to 30 minutes. The aim is to show that a stellarator fusion reactor is viable. The advantages would be steady state operation and absence of large scale instabilities (disruptions).

10 min break

Tutorial AKjDPG 1.2 Sun 16:55 K 1.011
What's up in complex/dusty plasmas? — ●DIETMAR BLOCK — Institute of Experimental and Applied Physics, Kiel University, Germany

This tutorial will introduce you to the field of dusty/complex plasmas. More than 25 years of intensive research on plasmas containing additional nano- or micrometer-size particles have provided us with a wealth of information on strongly correlated systems and plasma-particle-interaction. Complex plasmas have proven to be a valuable model system to study strongly coupled systems at a kinetic level as well as to study fundamentally the interaction of plasmas with objects. Starting with a review of basic features of complex plasmas and standard diagnostics, the talk will provide a reference frame for you to successfully relate recent progress in the field with contributions being presented at this DPG meeting.