Plenarvortrag PV II Mo 15:15 HS G

Theory of plasma confinement in stellarators — •Per Helander — Max Planck Institute for Plasma Physics, Greifswald, Germany

At the Max Planck Institute for Plasma Physics in Greifswald, a very large stellarator, Wendelstein 7-X, is under construction. In this talk a broad overview of the physics of plasma confinement by three-dimensionally shaped magnetic fields will be provided. The magnetohydrodynamic equilbrium, particle orbits, collisional transport and turbulence will be discussed with an emphasis on basic concepts and optimisation strategies. In contrast to the tokamak, the magnetic field of a stellarator is not axisymmetric and the collisionless particle orbits are therefore in general not well confined. There are however several classes of magnetic fields with weaker symmetry that still guarrantee good confinement. These will be described in terms of mathematics and plasma physics, and an outlook on Wendelstein 7-X will be offered.