Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

CHAMPP
CENTER IN HAMBURG
FOR ASTRO, MATHEMATICAL
AND PARTICLE PHYSICS

LECTURE COURSE IN THE CHAMPP GRADUATE SCHOOL

Winter Term 2018/2019

Physics of Plasma Accelerators

J. Osterhoff

Course Description:

The exciting field of particle acceleration in plasmas has seen enormous progress over the last decade. It investigates the interaction of laser pulses of highest intensities and relativistic high current-density particle beams with plasmas for the generation of accelerating electric fields in excess of 10 GV/m. Such field strengths surpass those in metallic particle accelerators, which are for example used in the flagship machines at DESY, by many orders of magnitude. Thus, these novel plasma-based schemes may pave the way for a revolution in state-of-the-art accelerator technology.

Lecture contents: introduction to intense, short-pulse lasers and plasma physics, laser propagation in plasmas and plasma wave excitation in the linear and nonlinear regime, particle injection into plasma waves, properties of in-plasma-accelerated particle beams, beam-driven plasma wakefield acceleration.

Prerequisites:

There are no prerequisites.
Basic knowledge in laser and accelerator physics is helpful.

Literature:

Will be discussed during the lecture.

Date and Place:	Wed, 14:00 – 15:30, SR 3, Jungiusstraße 9
Problem Classes:	Wed, 15:45 – 16:30, SR 3, Jungiusstraße 9 Starting on: 31 October 2018
Starting on:	17 October 2018