P 22 Hauptvortrag (R.D. Stambaugh)

Zeit: Dienstag 10:15–11:00 Raum: HU 3038

Hauptvortrag

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Star power is fusion power, the energy released by fusing together light nuclei. Fusion on earth will be done in a 100 million degree plasma made of deuterium and tritium. The worldwide fusion research community is about to embark on construction of ITER, the first experiment that will burn a DT plasma by copious fusion reactions. ITER will create 500 MW of fusion with a nominal energy gain of 10, sufficiently high that the plasma is dominantly self-heated by the fusion-produced alpha particles. Its all superconducting magnet technology and steady-state heat removal technology will enable nominal 500 second pulses to allow the study of burning plasmas on the longest intrinsic timescale of the confined plasma - diffusive redistribution of the electrical currents in the plasma. The advances in magnetic confinement physics that have led to this opportunity will be described, as well as the research opportunities afforded by ITER. The physics of confining stable plasmas and heating them will lead to the high gain state in ITER. Sustained burn will come from the physics of controlling currents in plasmas and interfacing the hot plasma to its room temperature surroundings.