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Soggetti Atoms

Physics

Nuclear fusion Nuclear energy

Plasma (Ionized gases)

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Atoms and Molecules in Strong Fields, Laser Matter Interaction

Nuclear Fusion Nuclear Energy Plasma Physics

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Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references at the end of each chapters and index. Nota di contenuto Nature of Plasma -- Orbit of Charged Particles in Various Magnetic Configurations -- Magnetohydrodynamics -- Equilibrium --Confinement -- Magnetohydrodynamic Instabilities -- Resistive Instability -- Boltzmann's Equation -- Waves in Cold Plasmas -- Wave Heating and Current Drive -- Instabilities Driven by Energetic Particles -- Plasma Transport by Turbulence -- Development of Fusion Researches -- Tokamak -- Reversed Field Pinch -- Stellarator -- Open End System -- Inertial Confinement. This new edition presents the essential theoretical and analytical Sommario/riassunto methods needed to understand the recent fusion research of tokamak and alternate approaches. The author describes magnetohydrodynamic and kinetic theories of cold and hot plasmas in detail. The book covers new important topics for fusion studies such as plasma transport by drift turbulence, which depend on the magnetic configuration and zonal flows. These are universal phenomena of microturbulence. They can modify the onset criterion for turbulent transport, instabilities driven by energetic particles as well as alpha particle generation and typical plasma models for computer simulation. The fusion research of tokamaks with various new versions of H modes are explained. The design concept of ITER, the international tokamak experimental reactor, is described for inductively driven operations as well as steadystate operations using non-inductive drives. Alternative approaches of reversed-field pinch and its relaxation process, stellator including quasi-symmetric system, open-end system of tandem mirror and inertial confinement are also explained. Newly added and updated topics in this second edition include zonal flows, various versions of H

in the field of controlled fusion. .

modes, and steady-state operations of tokamak, the design concept of ITER, the relaxation process of RFP, quasi-symmetric stellator, and tandem mirror. The book addresses graduate students and researchers