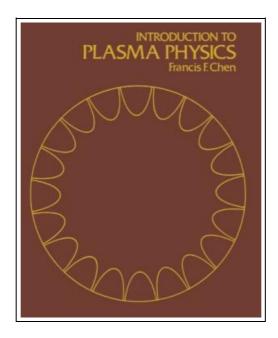
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(Dr. Veronica Hoppe)

INTRODUCTION TO PLASMA PHYSICS



Book Condition: New. Publisher/Verlag: Springer, Berlin | This book grew out of lecture notes for an undergraduate course in plasma physics that has been offered for a number of years at UCLA. With the current increase in interest in controlled fusion and the wide spread use of plasma physics in space research and relativistic as trophysics, it makes sense for the study of plasmas to become a part of an undergraduate student's basic experience, along with subjects like thermodynamics or quantum mechanics. Although the primary purpose of this book was to fulfill a need for a text that seniors or juniors can really understand, I hope it can also serve as a painless way for scientists in other fields-solid state or laser physics, for instance to become acquainted with plasmas. Two guiding principles were followed: Do not leave algebraic steps as an exercise for the reader, and do not let the algebra obscure the physics. The extent to which these opposing aims could be met is largely due to the treatment of a plasma as two interpenetrating fluids. The two-fluid picture is both easier to understand and more accurate than the single-fluid approach, at least for low-density plasma phe nomena. | 1. Introduction.- Occurrence of Plasmas in Nature.- Definition of Plasma.- Concept of Temperature.- Debye Shielding.-The Plasma Parameter.- Criteria for Plasmas.- Applications of Plasma Physics.- 2. Single-Particle Motions.- Uniform E and B Field.- Nonuniform B Field.- Nonuniform E Field.- TimeVarying E Field.- Time-Varying B Field.- Summary of Guiding Center Drifts.- Adiabatic Invariants.- 3. Plasmas as Fluids.- Relation of Plasma Physics to Ordinary Electromagnetics.- The Fluid Equation of Motion.- Fluid Drifts Perpendicular to B.- Fluid Drifts Parallel to B.- The Plasma Approximation.- 4. Waves in Plasmas.- Representation of Waves.- Group Velocity.- Plasma Oscillations.- Electron Plasma Sound Waves.- Ion Waves.- I



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