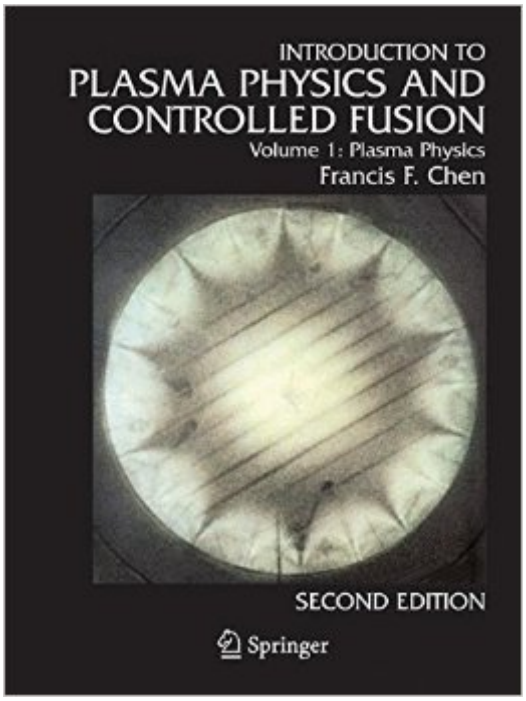
Introduction To Plasma Physics And Controlled Fusion. Volume 1, Plasma Physics



Synopsis

TO THE SECOND EDITION In the nine years since this book was first written, rapid progress has been made scientifically in nuclear fusion, space physics, and nonlinear plasma theory. At the same time, the energy shortage on the one hand and the exploration of Jupiter and Saturn on the other have increased the national awareness of the important applications of plasma physics to energy production and to the understanding of our space environment. In magnetic confinement fusion, this period has seen the attainment 13 of a Lawson number nTE of 2 x 10 cm -3 sec in the Alcator tokamaks at MIT; neutral-beam heating of the PL T tokamak at Princeton to KTi = 6. 5 keV; increase of average Ã to 3%-5% in tokamaks at Oak Ridge and General Atomic; and the stabilization of mirror-confined plasmas at Livermore, together with injection of ion current to near field-reversal conditions in the 2XIIÃ device. Invention of the tandem mirror has given magnetic confinement a new and exciting dimension. New ideas have emerged, such as the compact torus, surface-field devices, and the EÃ T mirror-torus hybrid, and some old ideas, such as the stellarator and the reversed-field pinch, have been revived. Radiofrequency heatÂ- ing has become a new star with its promise of dc current drive. Perhaps most importantly, great progress has been made in the understanding of the MHD behavior of toroidal plasmas: tearing modes, magnetic Vll Vlll islands, and disruptions.

Book Information

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Customer Reviews

I first bought this text for an undergraduate course in plasmas, and I liked it then -- Chen’s first few

chapters will get you through the basics without any undue suffering (you'll hurt because the subject can be difficult, not because the text is unclear.) After spending a few months on my shelf, it reappeared for some research I was doing that required me to get comfortable with a few different types of plasma waves. Now Chen has come back into my life -- I'm taking a graduate course in kinetic theory of plasmas, and I find myself opening up this book on a daily basis to figure something out. This textbook has served me well, and if you're doing work (coursework or research) in the plasmas field, it will likely serve you well, too. The first four or five chapters are written so that a senior-level physics undergrad can understand them, so you get a nice conceptual grasp of the subject (as well as good reference material on more advanced topics.)One point: I wouldn't recommend buying this as a "teach yourself plasma physics on a desert island" kind of book. If you can find someone who knows the subject, though, Chen will help you to learn a lot after they've explained a few basic points.Basic subjects covered are:Orbit theory (single particle motion, adiabatic invariants)Fluid approximationPlasma waves (O, X, R, L, acoustic, and many others)Diffusion and resistivityEquilibrium/stability issuesKinetic theoryAssorted non-linear effects

19 years later this is still the best introduction to plasma physics. Obviously written by an experimentalist. Well grounded. Emphasis on problem solving. Lots of examples. Intuitive explanations before the math. Explanations of experiments and even experimental results. Solutions in the back make it well suited for self-learners. A 3rd edition would be nice with maybe a little intro to computational methods. A vol 2 would be even nicer.

This is a great introduction to plasma physics. I have used this book for both undergraduate and graduate work and it lends itself well to either. Starts out basic enough for 3rd and 4th year undergrads to work with and also has enough detailed information for more advanced graduate studies. I have to recommend this as the best introduction to this field out there.

This is a great book for introductory level plasma physics for undergraduates. Deals with everything from particle drifts to kinetic effects in an easy to understand physical approach. There is also a nice review of waves in plasmas.

I took an intro to plasma physics class using this book at the undergraduate level - and this book was perfect. It has a good blend of experimental evidence, theory, and math. The derivations are really good, you can follow along in the margins. The pictures are clear and beautiful, the page

layout easy on the eyes. This is not a graduate text, but aimed at the advanced undergrad level. You should already know calculus, complex analysis, EM, and linear algebra before learning this material.

Excellent overview of plasma physics theory. Covers all the bases. From plasma applications to non-linear effects in plasmas. There is also a great introduction to Kinetic Theory and controlled fusion physics.

A very accessible text on a somewhat esoteric, but important branch of physics. Concepts are explained clearly and mathematical derivations are easy to follow. Many exercise problems scattered throughout the text help keep you on top of the material. Solutions to selected problems in the back help you check yourself before you wreck yourself. If only a full solutions manual were available!

The texts of this book are not long,but are very clear in physics concepts and are simplied: 1.All important math steps to prove the physics are mentioned(not released to the reader) in simplied way so that readers can know clearly both the math steps and physics meanings without being buffered by complecated math steps. 2.The author mentioned clearly the physics meaning of any equation. I am a bachalor of physics,such kind of textbook(clear and simple and friendly) I had had only two:textbook named "Introduction to Electrodynamic" and "Introduction to Quantum Mechanics" written by famous author,Mr. Grify. As a result,I think it is a very good textbook,at least for students who start to learn plamsa physics.

Introduction to Parametric Modeling: Autodesk Authorized Publisher Head First Physics: A learner's companion to mechanics and practical physics (AP Physics B - Advanced Placement) Paracord Fusion Ties - Volume 1: Straps, Slip Knots, Falls, Bars, and Bundles Paracord Fusion Ties - Volume 2: Survival Ties, Pouches, Bars, Snake Knots, and Sinnets Conductors, Semiconductors, Superconductors: An Introduction to Solid State Physics (Undergraduate Lecture Notes in Physics) Physics for Scientists and Engineers, Volume 2: Electricity, Magnetism, Light, and Elementary Modern Physics The Feynman Lectures on Physics, Vol. II: The New Millennium Edition: Mainly Electromagnetism and Matter (Feynman Lectures on Physics (Paperback)) (Volume 2) Thermodynamics and the Kinetic Theory of Gases: Volume 3 of Pauli Lectures on Physics (Dover Books on Physics) Oracle Fusion Applications Development and Extensibility Handbook (Oracle Press) Mobile Robot Localization and Map Building: A Multisensor Fusion Approach Fusion: Integrating Ie, Case, and Jad : A Handbook for Reengineering the Systems Organization (Yourdon Press Computing Series)