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Titolo	Plasma Theory : An Advanced Guide for Graduate Students / / Vladimir Rozhansky
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Descrizione fisica	1 online resource (XI, 363 p. 108 illus., 11 illus. in color.)
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Lingua di pubblicazione	Inglese
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Note generali	Includes index.
Nota di contenuto	Chapter 1. Plasma Kinetics -- Chapter 2. Transport equations -- Chapter 3. Quasineutral plasma and sheath structure -- Chapter 4. Diffusion in partially ionized unmagnetized plasma -- Chapter 5. Diffusion of partially ionized magnetized plasma -- Chapter 6. Partially ionized plasma with current -- Chapter 7. Transport in strongly ionized plasma across a magnetic field -- Chapter 8. Drift waves and turbulent transport -- Chapter 9. Dynamics of fully ionized plasma in the absence of a magnetic field -- Chapter 10. Magnetohydrodynamics (MHD) -- Chapter 11. Dynamics of plasma blobs and jets in a magnetic field -- Chapter 12. Plasma equilibrium -- Chapter 13. Transport phenomena in tokamaks -- Chapter 14. Instabilities in magnetized plasma -- Chapter 15. Magnetic islands and stochastic magnetic field -- Chapter 16. Improved confinement regime (H-mode).
Sommario/riassunto	This textbook, based on the author’s classroom-tested lecture course, helps graduate students master the advanced plasma theory needed to unlock results at the forefront of current research. It is structured around a two semester course, beginning with kinetic theory and transport processes, while the second semester is devoted to plasma dynamics, including MHD theory, equilibrium, and stability. More advanced problems such as neoclassical theory, stochastization of the magnetic field lines, and edge plasma physics are also considered, and each chapter ends with an illustrative example which demonstrates a concrete application of the theory. The distinctive feature of this book

is that, unlike most other advanced plasma science texts, phenomena in both low and high temperature plasma are considered simultaneously so that theory of slightly ionized and fully ionized plasmas is presented holistically. This book will therefore be ideal as a classroom text or self-study guide for a wide cohort of graduate students working in different areas like nuclear fusion, gas discharge physics, low temperature plasma applications, astrophysics, and more. It is also a useful reference for more seasoned researchers.