

1. Record Nr.	UNINA9911015962203321
Autore	Macchi Andrea
Titolo	A Superintense Laser-Plasma Interaction Theory Primer // by Andrea Macchi
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	9783031909832 9783031909825
Edizione	[2nd ed. 2025.]
Descrizione fisica	1 online resource (258 pages)
Collana	SpringerBriefs in Physics, , 2191-5431
Disciplina	530.443
Soggetti	Plasma (Ionized gases) Plasma waves Electrodynamics Laser plasmas Plasma Physics Waves, instabilities and nonlinear plasma dynamics Classical Electrodynamics Laser-produced Plasma
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Basic Tools of Laser Plasma Physics -- Nonlinear Laser Plasma Optics -- Electron Acceleration -- Ion Acceleration -- An Outlook in the Quantum Regime.
Sommario/riassunto	This 2nd edition offers an introduction to the field of superintense laser-plasma interactions, a domain that has unlocked new regimes of scientific inquiry and technological advancement. By focusing on fundamental models and illustrative examples, this second edition serves as an essential primer for those seeking to understand the complexities of laser-plasma dynamics without requiring prior knowledge of plasma physics. Key concepts such as the pressure of light, radiation friction, and nonlinear relativistic dynamics are examined providing readers with a basic framework for understanding the subject. The book delves into laser-plasma based electron and ion acceleration, offering an insight into the potential for groundbreaking

applications in radiation sources and high field studies. This edition also introduces some new topics reflecting the latest advancements in the field, including an outlook to the quantum regime of strong field interactions. Ideal for students, researchers, and professionals in physics and engineering, this book is a valuable resource for anyone interested in the cutting-edge science of laser-plasma interactions. Whether used as a textbook, a quick reference, or an accessible introduction, it equips readers with the knowledge to navigate and contribute to this dynamic area of research.

---