1. Record Nr. UNINA9910781583003321

Titolo	Handbook for highly charged ion spectroscopic research / / [edited by] Yaming Zou, Roger Hutton
Pubbl/distr/stampa	Boca Raton : , : Taylor & Francis, , 2012
ISBN	0-429-14336-2 1-4200-7905-0
Descrizione fisica	1 online resource (452 p.)
Classificazione	SCI074000SCI055000SCI077000
Altri autori (Persone)	ZouYaming HuttonR (Roger)
Disciplina	543/.65
Soggetti	Ion mobility spectroscopy Atomic structure Quantum electrodynamics Parity nonconservation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Dedication; Contents; Preface; Editors; Contributors; Part I: Tools and Techniques; 1. Light Sources for Atomic Spectroscopy; 2. Electron Beam Ion Traps: Principles and Applications to Highly Charged Ion Spectroscopy; 3. Spectroscopic Instruments; 4. Crystal Spectrometers; 5. CCD Detectors; 6. Microchannel-Plate Detectors in Atomic Physics Applications; 7. Coincidence Techniques in Atomic Collisions; 8. Isoelectronic Trends in Atomic Properties; Part II: Investigations of Atomic Structure and Applications; 9. Experimental Investigation of the Structure of Highly Ionized Atoms 10. Atomic Lifetime Measurements of Highly Charged Ions11. Importance of Tungsten Spectroscopy to the Success of ITER; 12. X-Ray Emission Spectroscopy and Diagnostics of Nonequilibrium Fusion and Laser-Produced Plasmas; 13. Short-Wavelength Free Electron Lasers; 14. QED Theory of Highly Charged Ions; 15. Parity Nonconservation Effects in the Highly Charged Ions
Sommario/riassunto	Preface Spectroscopy of highly charged ions is of enormous interest due to its key role in testing quantum electrodynamics (QED), in strong fields and to possible tests on parity nonconservation (PNC), both of

which are discussed in this volume. However, highly charged ions also play crucial roles in the physics of hot plasmas, for example, those produced in tokamak fusion devices and in inertial confinement fusion experiments. Much of the diagnostics of matter under such extreme environments relies heavily on spectroscopy and the availability of atomic data. The field of X-ray astronomy hinges almost entirely on the use of spectral lines from highly charged ions to provide information from distant astrophysical plasmas and objects. Given these fundamental interests and the current rapid developments in fusion and X-ray astronomy, it is clear that the spectroscopy of highly charged ions is a very rich area of research with strong and important connections with many important subfields of physics, for example, nuclear physics. The need for high-quality atomic data is as important now as it has ever been. Hence we feel that the idea behind this book is very timely. The aim of this book was to bring together a number of the techniques and ideas needed for highly charged ion spectroscopy research. The book is organized in two parts. Part I brings together techniques of light/ion sources, spectrometers, and detectors and includes also a chapter on coincidence techniques. This part ends with a discussion on how atomic properties change along an isoelectronic sequence. Part II is devoted to investigations of atomic structure and to applications and also to some of the theoretical ideas where precise studies of highly charged ion spectroscopy can be of fundamental significance,--