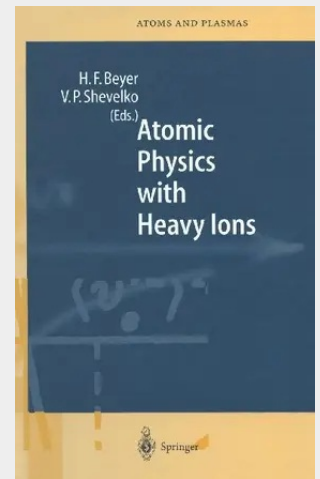


Atomic Physics with Heavy Ions

This book is devoted to one of the most active domains of atomic physics- atomic physics of heavy positive ions. During the last 30 years, this terrain has attracted enormous attention from both experimentalists and theoreticians. On the one hand, this interest is stimulated by rapid progress in the development of laboratory ion sources, storage rings, ion traps and methods for ion cooling. In many laboratories, a considerable number of complex and accurate experiments have been initiated, challenging new frontiers. Highly charged ions are used for investigations related to fundamental research and to more applied fields such as controlled nuclear fusion driven by heavy ions and its diagnostics, ion-surface interaction, physics of hollow atoms, x-ray lasers, x-ray spectroscopy, spectrometry of ions in storage rings and ion traps, biology, and medical therapy. On the other hand, the new technologies have stimulated elaborate theoretical investigations, especially in developing QED theory, relativistic many body techniques, plasma-kinetic modeling based on the Coulomb interactions of highly charged ions with photons and various atomic particles - electrons, atoms, molecules and ions. The idea of assembling this book matured while the editors were writing another book, X-Ray Radiation of Highly Charged Ions by H. F. Beyer, H. -J. Kluge and V. P. Shevelko (Springer, Berlin, Heidelberg 1997) covering a broad range of x-ray and other radiative phenomena central to atomic physics with heavy ions.

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