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Titolo	Trapping Single Ions and Coulomb Crystals with Light Fields // by Leon Karpa
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Disciplina	535.15 541.372
Soggetti	Quantum optics Phase transformations (Statistical physics) Condensed materials Atoms Physics Quantum physics Lasers Photonics Quantum Optics Quantum Gases and Condensates Atoms and Molecules in Strong Fields, Laser Matter Interaction Quantum Physics Optics, Lasers, Photonics, Optical Devices
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Note generali	Includes index.
Nota di contenuto	Chapter1. Introduction -- Chapter2. Trapping ions with light elds -- Chapter3. Optical dipole traps for single ions -- Chapter4. Optical trapping of Coulomb crystals -- Chapter5. Summary and Outlook.
Sommario/riassunto	This book describes the state-of-the-art in the emerging field of optical trapping of ions, as well as the most recent advances enabling the use of this technique as a versatile tool for novel investigations in atomic physics. The text provides a detailed explanation of the requirements for optical trapping of ions, replete with a protocol for

optical ion trapping, including preparation, transfer, and detection. The book also highlights the experimental requirements for extending the presented scheme to optical trapping of linear ion chains. Lastly, this text elaborates on the key features of the described approach, such as the capability to arrange single strongly interacting atoms in scalable, state-selective and wavelength-sized optical potentials without the detrimental impact of driven radiofrequency fields conventionally used to trap ions. The described results demonstrate that the developed methods are suitable for new experimental investigations, most notably in the field of ultracold interaction of ions and atoms, but also in quantum simulations and metrology. The book's practical bent is perfect for anyone attempting to build an experiment related to the field or understand the limitations behind current experiments.

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