Record Nr. UNINA9910774739903321 Autore Walecka John Dirk <1932-> Titolo Electron Scattering for Nuclear and Nucleon Structure / / John Dirk Walecka Cambridge, United Kingdom:,: Cambridge University Press,, 2022 Pubbl/distr/stampa **ISBN** 9781009290616 Edizione [First edition.] Descrizione fisica 1 online resource (378 pages): illustrations Cambridge monographs on particle physics, nuclear physics, and Collana cosmology Disciplina 539.72112 Soggetti Electrons - Scattering Nuclear structure Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Part I. Introduction: 1. Motivation: 2. Pictures of the nucleus: 3. Some Nota di contenuto optics; 4. Why electron scattering?; 5. Target response surfaces; 6. Why coincidence experiments?; 7. Units and conventions; Part II. General Analysis: 8. Electromagnetic interactions: 9. Multipole analysis: 10. Dirac equation; 11. Covariant analysis; 12. Excitation of discrete states in (e, e\*); 13. Coincidence experiments (e, e\* X); 14. Deep inelastic scattering from the nucleon; 15. Polarization in deep inelastic scattering; 16. Parity violation in inclusive electron scattering; Part III. Quantum Electrodynamics: 17. Basic elements; 18. Radiative corrections; Part IV. Selected Examples: 19. Basic nuclear structure; 20. Some applications; 21. A relativistic model of the nucleus; 22. Elastic scattering; 23. Quasielastic scattering; 24. The quark model; 25. Quantum chromodynamics; 26. The standard model; 27. Parity violation; 28. Excitation of nucleon resonances; Part V. Future Directions: 29. TJNAF(CEBAF); 30. Other facilities; 31. Future directions; Appendixes. Sommario/riassunto The scattering of high-energy electrons from nuclear and nucleon targets provides a microscope for examining the structure of these tiny objects. The best evidence we have on what nuclei and nucleons actually look like comes from electron scattering. This 2001 book examines the motivation for electron scattering and develops the

theoretical analysis of the process. It discusses our theoretical

understanding of the underlying structure of nuclei and nucleons at appropriate levels of resolution and sophistication, and summarizes experimental electron scattering capabilities. Only a working knowledge of quantum mechanics and special relativity is assumed, making this a suitable textbook for graduate and advanced undergraduate courses. It will also provide a valuable summary and reference for researchers already working in electron scattering and other areas of nuclear and particle physics. This text has been reissued as an Open Access publication on Cambridge Core.