Record Nr. UNINA9910741194503321 Autore Schmitz Wouter Titolo Particles, Fields and Forces: A Conceptual Guide to Quantum Field Theory and the Standard Model / / by Wouter Schmitz Pubbl/distr/stampa Cham:,: Springer International Publishing:,: Imprint: Springer,, 2019 **ISBN** 3-030-12878-4 Edizione [1st ed. 2019.] Descrizione fisica 1 online resource (322 pages) Collana The Frontiers Collection, , 1612-3018 628.53 Disciplina Soggetti Elementary particles (Physics) Quantum field theory String theory **Physics** Elementary Particles, Quantum Field Theory Quantum Field Theories, String Theory Popular Science in Physics History and Philosophical Foundations of Physics Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Introduction -- Particles or waves? -- Fields -- What is a particle if it is Nota di contenuto a wave? -- A matter of energy exchange -- A wave of relativity --Quantization of fields -- Energy in waves and fields -- Symmetry and the origin of force -- Propagators and virtual particles --Renormalisation of fearful infinities -- Spin makes up bosons and fermions -- Conservation of charge and particle number -- Particle zoo -- Electroweak force in the early universe -- The breaking of the world will never be the same -- The strong force: Quantum Chromo Dynamics -- Gravity as a field -- Further reading -- References and Sommario/riassunto How can fundamental particles exist as waves in the vacuum? How can such waves have particle properties such as inertia? What is behind the notion of "virtual" particles? Why and how do particles exert forces on one another? Not least: What are forces anyway? These are some of the

central questions that have intriguing answers in Quantum Field Theory

and the Standard Model of Particle Physics. Unfortunately, these theories are highly mathematical, so that most people - even many scientists - are not able to fully grasp their meaning. This book unravels these theories in a conceptual manner, using more than 180 figures and extensive explanations and will provide the nonspecialist with great insights that are not to be found in the popular science literature.