Relativistic Quantum Mechanics; Hartmut Pilkuhn; 9783662052754; 240 pages; Springer Science & Business Media, 2013; 2013

Quantum Signatures in Laser-Driven Relativistic Multiple Scattering. Physical Review Letters, Vol. 91, Issue. 17Â â€˜The book is very readable and could easily be used as background reading to an advanced relativistic quantum mechanics undergraduate course as well as the postgraduate audience for which it is intended â€¦ Any researcher desiring to pursue a career in relativistic condensed matter will find it invaluable.â€™ The problems which arise for a relativistic quantum mechanics are reviewed and critically examined in connection with the foundations of quantum field theory.Â The book contains some previously unpublished results. It addresses both the researcher and the graduate student in modern statistical mechanics and quantum field theory. View. Show abstract.Â The possibility of formulating a classical relativistically invariant mechanics of an arbitrary number of interacting point particles is demonstrated. This theory is similar to Newtonian mechanics inasmuch as the interaction between any pair of particles contains an arbitrary function of their distance. Fundamental for quantum mechanics is the concept of particle-wave duality. Formally particle-wave duality is expressed by the Einstein-de Broglie relations: E = hÂ¯Ï‰, p = hÂ¯kÂ To construct a relativistic wave equation we shall use the relations that provide the transition from classical mechanics to quantum mechanics: E. â†’. In physics, relativistic quantum mechanics (RQM) is any PoincarÃ© covariant formulation of quantum mechanics (QM). This theory is applicable to massive particles propagating at all velocities up to those comparable to the speed of light c, and can accommodate massless particles. The theory has application in high energy physics, particle physics and accelerator physics, as well as atomic physics, chemistry and condensed matter physics. Non-relativistic quantum mechanics refers to the mathematical