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Review of Particle Physics

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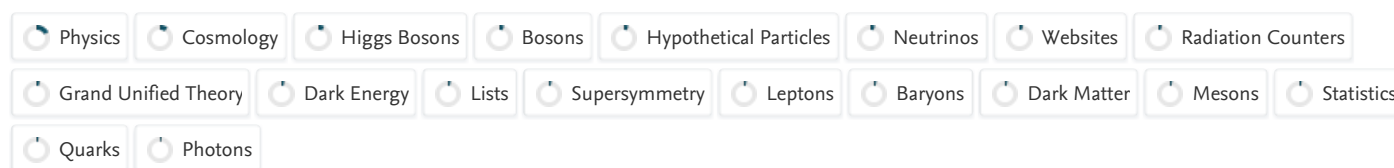


Abstract

The Review summarizes much of particle physics and cosmology. Using data from previous editions, plus 2,873 new measurements from 758 papers, we list, evaluate, and average measured properties of gauge bosons and the recently discovered Higgs boson, leptons, quarks, mesons, and baryons. We summarize searches for hypothetical particles such as supersymmetric particles, heavy bosons, axions, dark photons, etc. Particle properties and search limits are listed in Summary Tables. We give numerous tables, figures, formulae, and reviews of topics such as Higgs Boson Physics, Supersymmetry, Grand Unified Theories, Neutrino Mixing, Dark Energy, Dark Matter, Cosmology, Particle Detectors, Colliders, Probability and Statistics. Among the 118 reviews are many that are new or heavily revised, including a new review on Neutrinos in Cosmology. Starting with this edition, the Review is divided into two volumes. Volume 1 includes the Summary Tables and all review articles. Volume 2 consists of the Particle Listings. Review articles that were previously part of the Listings are now included in volume 1. The complete Review (both volumes) is published online on the website of the Particle Data Group (<http://pdg.lbl.gov>) and in a journal. Volume 1 is available in print as the PDG Book. A Particle Physics Booklet with the Summary Tables and essential tables, figures, and equations from selected review articles is also available. The 2018 edition of the Review of Particle Physics should be cited as: M. Tanabashi (Particle Data Group), Phys. Rev. D 98, 030001 (2018).

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The Review of Particle Physics[2] (formerly Review of Particle Properties, Data on Particles and Resonant States, and Data on Elementary Particles and Resonant States) is a voluminous, 1,200+ page reference work which summarizes particle properties and reviews the current status of elementary particle physics, general relativity and big-bang cosmology. The Review is currently divided into 3 sections: Particle Physics Summary Tables—Brief tables of particles: gauge and higgs bosons, leptons, quarks, mesons, baryons, constraints for the search for hypothetical particles and violation of physical laws. This biennial Review summarizes much of particle physics. Using data from previous editions, plus 2658 new measurements from 644 papers, we list, evaluate, and average measured properties of gauge bosons, leptons, quarks, mesons, and baryons. We summarize searches for hypothetical particles such as Higgs bosons, heavy neutrinos, and supersymmetric particles. All the particle properties and search limits are listed in Summary Tables. We also give numerous tables, figures, formulae, and reviews of topics such as the Standard Model, particle detectors, probability, and statistics.