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REVIEW OF PARTICLE PHYSICS*

Particle Data Group

Abstract

This biennial *Review* summarizes much of Particle Physics. Using data from previous editions, plus 1726 new measurements from 512 papers, we list, evaluate, and average measured properties of gauge bosons, leptons, quarks, mesons, and baryons. We also 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. Among the 119 reviews are many that are new or heavily revised including those on neutrino mixing, CP violation in K, D, and B mesons, V_{cb}, the new exotic $\Theta(1540)$ particle, extra-dimensions, grand unified theories, cosmic background radiation, dark matter, cosmological parameters, and big bang cosmology. A booklet is available containing the Summary Tables and abbreviated versions of some of the other sections of this full *Review*. All tables, listings, and reviews (and errata) are also available on the Particle Data Group website: `http://pdg.lbl.gov`.

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We dedicate this edition of the Review of Particle Physics to the memory of two long-time members of the Particle Data Group, Lucien Montanet and Giovanni Conforto, both of whom died in 2003.

†Lucien Montanet (1930–2003)

Lucien Montanet died on Thursday June 19, 2003. Lucien was a pioneer of high energy physics, becoming in 1957 one of the first physicists at CERN. For his PhD thesis, he analyzed interactions of cosmic rays in a Wilson cloud chamber run at the top of Switzerland's Jungfraujoch mountain. Later he joined Charles Peyrou and Raphael Armenteros to analyze photographs of proton-antiproton annihilations in an 81-cm bubble chamber, one of the earliest such analysis at CERN. He co-signed the discovery of the first meson resonance found at CERN and in Europe, the E meson, now call the $\eta(1440)$. Thus began a long career devoted to meson and baryon spectroscopy, a field in which he became one of the leading experts. He organized and lead numerous workshops and conferences on hadron spectroscopy, and was a frequent rapporteur for review talks on these topics. He was a key member of the Particle Data Group from 1977 through 1996.

Lucien initiated and coordinated several important experiments, including the European Hybrid Spectrometer at the CERN SPS, designed to study complex hadronic final states, strong-interaction dynamics, and features of the associated weak decays.

In 1985, Lucien was appointed coordinator of the CERN-USSR (now CERN-Russia) Committee, where he fostered excellent relations between CERN and Russia. In 1990, he became a member of the Scientific Council of the Joint Institute for Nuclear Research (JINR) at Dubna, and played a key role in defining JINR's scientific policy. In 1973, he became editor of "Physics Letters" and continued in this role even after his retirement in 1995. Many publications of CERN and other European laboratories underwent the expert and critical scrutiny of Lucien and his partner Klaus Winter.

In Lucien Montanet, we have lost one of the pioneers of modern high-energy physics, an inspired, generous, and friendly member of our community and a true lover of science.

†Giovanni Conforto (1938–2003)

Gianni Conforto died in May 2003. He was born in Rome on August 30, 1938 and received his Ph.D. from the University of Rome in 1961. He pursued a rich physics career at CERN, Enrico Fermi Institute of the University of Chicago, Rutherford Laboratory, INFN Roma, INFN Firenze, University of Michigan at Ann Arbor, University of Hamburg, and University of Urbino, working on many experiments, including NOMAD, L3, Crystal Ball, and Gargamelle. His wide-ranging research interests included weak decays of leptons and baryons, properties of mesons and baryons including states with strangeness, charm, and beauty, the Upsilon meson, the Z boson, neutrino physics, astrophysics, and cosmology.

From 1988 to 2003, he made significant contributions to the Review of Particle Physics in the W boson and K meson sections.

In Gianni Conforto, we have lost a charming person, a real gentleman, and an accomplished physicist.