

# REVIEW OF PARTICLE PHYSICS\*

Particle Data Group

## *Abstract*

This biennial *Review* summarizes much of particle physics. Using data from previous editions, plus 2633 new measurements from 689 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 110 reviews are many that are new or heavily revised including those on CKM quark-mixing matrix,  $V_{ud}$  &  $V_{us}$ ,  $V_{cb}$  &  $V_{ub}$ , top quark, muon anomalous magnetic moment, extra dimensions, particle detectors, 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>.

## Particle Data Group

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**HIGHLIGHTS OF THE 2006 EDITION OF THE REVIEW OF PARTICLE PHYSICS**

- 689 new papers with 2633 new measurements.
- Complete rearrangement of the neutrino listings, including a neutrino mixing section that now contains measurements of the mixing angles and mass differences in the three-neutrino framework.
- Latest from  $B$ -meson physics: 186 papers with 780 measurements:  $CP$  violation, mixing, polarization in  $B$  decays, determination of  $V_{cb}$ , and  $V_{ub}$  *etc.*
- Latest high precision  $K_L$  branching ratios and  $CP$  violation amplitudes.
- Major improvements in  $K_{\ell 3}$  form factors data and review.
- Many new results in the sections on strongly-decaying mesons: 140 papers with 717 measurements.
- 110 reviews (most are revised or new).
- New review on the “CKM quark-mixing matrix”.
- New reviews on “Determination of  $V_{cb}$ ,  $V_{ub}$ ,” and “ $V_{ud}$ ,  $V_{us}$ , Cabibbo angle and CKM unitarity.”
- New review on muon anomalous magnetic moment (g-2).
- New review of extra-dimensions.
- Updated astroparticle physics reviews including WMAP3 results.
- Major update of the top quark review.
- Revised “Quark Model” review with new section on lattice QCD.
- New and revised sections in Particle Detectors review, especially on photodetectors and collider superconducting magnets.

**COLOR VERSIONS OF MANY FIGURES AVAILABLE AT END OF BOOK.**