

HIGHLIGHTS OF THE 2024 EDITION OF THE REVIEW OF PARTICLE PHYSICS

All PDG data and review articles are available online at pdg.lbl.gov.

869 new papers with 2,717 new measurements

120 reviews (most are revised)

- 320 new measurements from *LHC* experiments (ATLAS, CMS and LHCb).
- Extensive *Higgs boson* coverage from 231 new papers and 557 measurements with latest results on mass, couplings, decay width and branching ratios, plus searches for other neutral and charged Higgs bosons.
- *Supersymmetry*: 36 new papers with 148 measurements with major exclusions.
- *Top quark*: 35 new papers provide latest results on mass, coupling, and the discovery of four top quark production at LHC.
- *W mass*: CDF published a new measurement of the *W* mass. It is more precise than the world average at the time, but the two results disagree. See comments in Particle Listings and our *W* mass review referencing the extensive studies done by the *LHC* TeV M_W working group.
- *c-, b-hadron physics*: 161 papers and 597 measurements provide world-best data on lifetimes, mixing, CP violation, CKM angles, and constraints on new physics.
- *Neutrino Physics*: 10 new papers with measurements on neutrino mass, mixing, and CP-violation.
- *Meson resonances*: Substantial improvements, including new cross particle fits involving $J/\psi(1S)$, $\psi(2S)$ and $\eta_c(1S)$, merging of $\pi_1(1400)$ and $\pi_1(1600)$ with non- $q\bar{q}$ quantum numbers into same node, listing of complex pole positions when available, and inclusion of recently observed states. Several mesons now considered established added to Summary Tables.
- New *naming scheme* for the many recently discovered mesons and baryons with *c* or *b* quarks that are not compatible with conventional $q\bar{q}$ or qqq structures. Listed in “Other mesons” and “Exotic baryons” sections.
- Major revision of *Higgs Physics* review summarizes latest LHC results and constraints on new physics.
- Major revision of *Cosmic rays* review, now covering all components of cosmic rays including neutrinos (which were previously discussed in Neutrino Telescopes in Particle Detectors for Non-Accelerator Physics).
- Major revision of *Large time-projection chambers for rare event detection* in Particle Detectors for Non-Accelerator Physics.
- Major revision of *Top Quark* review summarizes latest LHC results and constraints on new physics from top quark.
- Major revision of *Heavy Non- $q\bar{q}$ Mesons* review follows new naming scheme for states not compatible with $q\bar{q}$ or qqq structures.
- *Semiconductor detectors* section of Particle Detectors at Accelerators review includes recent developments.
- New section on goodness-of-fit tests and expanded discussion of statistical tests in *Statistics* review.
- Updated EWK fit in *Electroweak Model and Constraints on New Physics* review.
- *Semileptonic B Hadron Decays, Determination of V_{cb} and V_{ub}* includes latest results and discusses long-standing issues with inclusive and exclusive measurements.
- Updated cross section results in the *Neutrino Cross Section Measurements* review.
- Updated τ decay parameters and branching ratio (BR) fits, including new treatment of $\text{BR}(a_1(1260) \rightarrow \pi\gamma)$.