DUTIES OF PDG SCIENTISTS

Each person prepared their own list; some people are more detailed and verbose than others, so length of list does not reflect extent of duties.

Yao Duties in PDG (page 1 of 2)

Bottom section, including bottom baryons and excited bottom mesons:

- $B^{\pm}$
- B^0
- B_s
- B_c
- B^*
- B_s^*
- Λ_b
- Σ_b
- Ξ_b
- $B^{\pm}$ and B^0 admixture
- b baryon admixture
- b hadron admixture
- CKM elements

Read and "encode": More than 182 papers and close to 860 measurements in the B section for RPP 2008 edition.

Work very closely with outside experts:

- Youngjoon Kwon (Belle)
- Giovanni Punzi (CDF)
- Jim Smith (BaBar).

Workload has increased significantly – at annual rate of 40% since 2000, due to B factories and Tevatron program.

Work closely with the international Heavy Flavor Averaging Group (HFAG) to obtain the best world averages on

- B^0 mixing
- B_s mixing
- branching fractions
- lifetimes
- CP violation parameters
- CKM element V_{cb}

[see next page]

Yao Duties in PDG (page 2 of 2)

Reviews:

B physics review.

Numerous other reviews, such as

- B production and decays
- B polarization
- CP violation
- BBbar mixing
- V_{ub}
- V_{cb}
- QCD

Groom Duties in PDG (Retiree)

Does Encoding (Data Listings):

- gamma (with Christoph Grab)
- Graviton
- Monopole searches

Monopole Review

Reviews and Tables:

1. Astrophysical Constants and Parameters: Extensively rewritten this year in collaboration with Erik Bergren. Cosmology parts: Redone to include post-Lambda results; includes latest WMAP analysis results.

2. Astrophysics reviews: Coordinator for five reviews which are actively overseen by Keith Olive. Finds referees (in consultation with Olive) and interacts with referees and the authors, etc.
    a. Big-Bang Cosmology
    b. The Cosmological Parameters
    c. Big-Bang Nucleosynthesis
    d. Dark Matter
    e. Cosmic Microwave Background

3. Atomic and Nuclear Properties: The table in the book is now generated by code that generates the much more extensive Atomic & Nuclear Properties web pages. The code has evolved over nearly a decade, but was considerably extended and updated for this edition.

4. Write new section on Cosmic Rays for Booklet

5. Edit:
    a. Experimental tests of General Relativity
    b. Cosmic ray fluxes: Rewritten, focused on new UHE results.
    c. Accelerator Physics of Colliders: Anticipate rewritten version with ILC additions for next edition.
    d. Passage of particles through matter (will have expanded TRD section)
    e. Particle detectors: Edited new section on gas detectors with new subsections on wire detectors, micro-pattern gas detectors, TPC's, TRD's, and revised RPC subsection. Wrote new section on hadron calorimetry, new introduction to (generic) calorimetry.
    f. Radioactivity and Radiation Protection.
    g. Commonly Used Radioactive Sources.

Dahl Duties in PDG (Retiree)

Current PDG computing.

Work on several tasks involved with the PDG computing.

1. Main expertise is with the auxiliary programs which are mostly in Fortran. Writes new programs as needed and also does necessary upgrades and maintenance on the present programs.

2. Examples:
    a. Program to run special K fits automatically using PDG database instead of copying data by hand. This eliminated a lot of hand work and made it possible for Lin to take over this part of Trippe's work.
    b. Program to automatically calculate the momenta for all the decays.

3. Modifying and updating PDG TeX macros and use of TeX and texsis. Converted all PDG macros from using texsis 2.16 to texsis 2.18

4. Moved all the web pages from a common directory to separate directories. Required untangling the intermixed files for the several web pages and fixing several problems.

5. Improvements for program which handles PDG mailing list. Can now use email (instead of postal mail) to send out institution verification letters and get responses.

6. Modifying the database table structure by adding tables and columns as needed by PDG auxiliary programs.

7. Maintains the documentation books for the database tables and the TeX macros.

8. Involved in the computing upgrade.

Lin Duties in PDG

Listing sections:

1. Responsible for K^+, K^0, K_S, and K_L listings.
2. Reviewed 20 publications and encoded over 40 measurements.
3. For the listings, read all the papers assigned and go through encodings. For most measurements, digest the encodings and re-encode them.
4. Work with verifiers and encoder to make sure the measurements are correctly encoded in the listings.

Major Reviews (see key on right):

1. Structure functions (A)
2. Fragmentation functions in e+ e- annihilation (A)
3. Plots of cross Sections and Related Quantities (B)
4. Tests of conservation laws (C)
5. Monte Carlo Particle numbering schemes (C)

Reviews in Listings (see key on right):

6. Charged kaon mass (D)
7. Rare kaon decays (A)
8. Dalitz plot parameters for $K \rightarrow 3\pi$ decays (D)
9. K^+_{l3} and K^0_{l3} form factors (C)
10. CPT invariance tests in neutral K decay (A)
11. CP violation in $K_S \rightarrow 3\ \pi$ (A)
12. V_{ud}, V_{us}, Cabibbo angle and CKM unitarity (A)
13. CP violation in K_L decays (C)

Key for review articles:
(A) = Articles written by external experts. Lin edits articles and works with referees
(B) = Get miscellaneous files and plots from authors. Edit and compile them into a single coherent review article.
(C) = Co-author of review.
(D) = Responsible for the review. No immediate changes.

Reviews in booklet: edit the reviews for the booklet

Fitting:

- Coordinated the efforts to convert all stand-alone kaon fits to the standard RPP fitting framework (completed for RPP08)
- Very labor intensive to manually go through the listings to check and understand odd fits
- (e.g. unusually large scale factor, large shift in central values, etc.) every time we run the fitter. Many kaon measurements are correlated so changing one entry could have significant impact on many other measurements.
- Working with Dahl to implement a global fit for the K_L CPV results (part of the computing upgrade efforts)

Computing related:

1. Responsible for the downloadable Monte Carlo particle files. Look through the files for problems.
2. Responsible for the webpages for the "Plots of cross sections and related quantities review). Modify the html files and plots for the current RPP edition.
3. Coordinate with external developers to provide PDG data for Palm Pilot and other PDAS.

Beringer Duties in PDG (page 1 of 2)

Listing sections (total of about 50 papers/year)

- Encoder for 1 section (free quark searches)
- Overseer for 6 sections
  - e
  - μ
  - π^0
  - $\pi^{\pm}$
  - η
  - top quark
- Coordinator for 2 sections
  - heavy boson searches
  - tau

Reviews:

- Author for 1 review: High Energy Collider Parameters
- Overseer/coordinator for 13 reviews:
  - Quark Model
  - Probability
  - Statistics
  - Monte Carlo Techniques
  - Top Quark
  - Muon Decay Parameters
  - Muon Anomalous Magnetic Moment
  - Tau Branching Fractions
  - Tau Decay Parameters
  - Pion Form Factors
  - W'
  - Z'
  - Leptoquarks

Recruiting of encoders, review authors and referees as needed

Interaction with HEP working groups (e.g. Tevatron Electroweak Working Group) to request and coordinate production of special fits that we include (top mass average)

Proofreading of reviews and listings

[see next page]

Beringer Duties in PDG (page 2of 2)

PDG Computing Operations and Upgrade

- Project leader
- Requirements definition
- Involvement in software design
- Evaluation of potentially useful technologies and tools
- Evaluation and purchasing of server hardware
- Oversight of system management
- Configuration of some of PDG computing services
- Installation, configuration and updates of pdgLive
- Writing of system management scripts
- Lots of testing

Representation of PDG in talks, e.g.

- PPA Summit
- DOE reviews

Administrative duties

- PI for NSF grant
- Participate in PDG budget meetings

Lots of communication via e-mail with dozens of encoders, overseers, review authors, referees, verifiers, working groups, ...

- Since joining PDG in 2004 dealt with approximately
- 3900 e-mails related to PDG computing
- 2700 e-mails related to Listings and Reviews

Attending conferences to learn about latest developments and get new insights about what should be added to PDG (e.g. initiated the review on the muon anomalous magnetic moment after discussions at ICHEP in 2004)

Wohl Duties in PDG (Retiree)

1) Searching the literature for papers to be encoded

2) Overseeing encoding for almost all the baryons.
   These are:
   a) "stable" baryons: p through Omega.
   b) "old" baryon resonances: N*s, Y*s, Xi*s.
   c) charm baryons (now there are 17).
   d) occasional anomalies like the pentaquarks.

3) Overseeing the ground-state D mesons:
   a) D^+
   b) D^0
   c) D_s^+

4) The above overseeing involves:
   a) Communicating with various encoders.
   b) Encoding most of the papers independently.
   c) Deciding what data go into the fits of branching fractions, etc.
   d) Demoting older data from fits and averages, and deleting obsolete data.
   e) Handling verification requests and their responses.
   f) Preparing the Summary Tables.

5) Updating the review on "Charmed Baryons."

6) Editing the reviews on D mesons.
   a) "D^0-D^0bar Mixing"
   b) "Dalitz-Plot Analysis Formalism"
   c) "Review of D-Meson Dalitz-Plot Analyses"
   d) "Decay Constants of Charged Pseudoscalar Mesons"

7) Updating the figure of the complex tau branching fractions.

8) Updating the Physical Constants table when CODATA reports new values
   (and looking over a few other sections that rarely change).

Barnett Duties in PDG (page 1 of 2)

International Particle Data Group – Head

Listings
- Quarks – overseer
- Gluons – overseer
- W Boson – coordinator
- Z Boson – coordinator
- Higgs – coordinator
- Axions – coordinator
- Supersymmetric particles – coordinator
- Technicolor – coordinator
- Compositeness – coordinator
- Extra Dimensions – coordinator

Reviews – Editor :
- Online Particle Physics Information
- Electroweak model and constraints on new physics
- The Cabibbo-Kobayashi-Mascara quark-mixing matrix
- Grand Unified Theories
- Axions and Other Very Light Bosons, Theory
- Axions and Other Very Light Bosons, Experimental Limits
- Quark Masses

Reviews – Coordinator:
- Searches for Higgs Bosons
- Axions and Other Very Light Bosons, Astrophysical Constraints
- Supersymmetry, Theory
- Supersymmetry, Experiment
- Supersymmetric Model Assumptions
- Dynamical Electroweak Symmetry Breaking
- Searches for Quark and Lepton Compositeness
- Extra Dimensions

Quality Control – oversee every aspect of production and operation

Schedule – drive the schedule so we are as close to on-time as possible

Budgets/Funding – handle all budget and all non-NSF funding matters

Collaborators – lead choice of collaborators, relations with them, communications with them, etc.

Relations with CERN, Japan, Russia, SLAC, etc. – Many issues including funding

[see next page]

Barnett Duties in PDG (page 2 of 2)

Publishers – handle entire bidding process and communications

Emails – handle every generic email sent to PDG (hundreds) to be sure the appropriate person responds

Organize:
- Program Reviews
- PDG Collaboration meetings
- PDG Advisory Committee meetings

Administrative
- Meetings with directors
- Committees

And much more, plus related activities:

LBNL
- Physics Division Staff Committee – Chair
- Lab Staff Committee – Member

Research related
- US LHC Users Organization – Chair
- US-ATLAS Executive Committee – Member
- Homestake DUSEL proposal – Co-Principal Investigator

Outreach related
- LHC Awareness Proposal – Initiator and Co-Principal Investigator
- US LHC Communications Task Force – Member
- ATLAS Education & Outreach Committee – Coordinator
- QuarkNet – Co-Principal Investigator
- Contemporary Physics Education Project – Founder, Vice President
- APS-Calif Section – Chair, then Past Cha