Databases and International Collaboration

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STUDENTS AND RESEARCHERS searching the SPIRES-HEP databases or consulting the *Review of Particle Physics* are reaping the benefits of two of the longest standing international collaborations in high energy physics. For decades, each of these collaborations has been working quietly and effectively to provide the field with core reference tools. Together these grass-root efforts produce a comprehensive, up-to-date, and highly accurate suite of resources supporting particle physics that are the envy of researchers and students in other fields. The fact that these tools are available free to the desktops of the worldwide particle physics community is unique and, in fact, only possible through the cost-effective tool of international collaboration.

The SPIRES-HEP collaboration, a joint project between the Stanford Linear Accelerator Center (SLAC) and the German Deutsches Elektronen Synchrotron (DESY) libraries with significant assistance from the Japanese High Energy Accelerator Research Organization (KEK) and the Japanese Yukawa Institute for Theoretical Physics, Kyoto University, produces a number of databases which provide comprehensive access to the literature of high energy physics as well as to conferences, people, institutions, and experiments in the field. The core database, known as SPIRES-HEP, contains over 355,000 records for preprints, articles, reports, and theses from 1974 to the present. The database contains World Wide Web links to the full text of papers when available, with over 100,000 such links currently in the database. These links are provided by cooperative efforts with the Los Alamos Electronic Preprint (E-Print) Archive, other laboratories, journal publishers, individual physics departments, and experimental groups.

Many other laboratories and physics groups such as CERN in Switzerland, Fermilab in Illinois, and the Institute of High Energy Physics (IHEP) in Serpukhov, Russia, contribute to and download information from the SPIRES-HEP system. The American Physical Society's *Physical Review D* supplies SLAC with advance links to papers accepted for publication and in return downloads SPIRES-HEP citation data and links into their system. The LANL E-print Archive has collaborated with SPIRES-HEP since its inception in 1991. Links in SPIRES-HEP are created nightly to the preprints posted at Los Alamos National Laboratory, and the LANL system downloads SPIRES-HEP cataloging data and citation links. Three sites, Yukawa Institute, DESY, and Durham (U.K.), run full mirror copies of SPIRES-HEP, while IHEP runs a partial mirror

site. Since the beginning, the SPIRES-HEP collaboration and the Particle Data Group have had a productive history of collaborative support and development.

For forty years the Particle Data Group has been an international collaboration that reviews particle physics and related areas of astrophysics and compiles and analyzes data on particle properties. The PDG produces the *Review of Particle Physics* (RPP) and the *Particle Physics Booklet*. These are distributed to 30,000 physicists, teachers, students, and other interested people around the world. The heavily used PDG website provides access to most of the data listings and reviews.

There are several centers of PDG work including Lawrence Berkeley National Labortory, CERN, KEK, IHEP, SLAC, and INFN, Italy. However, all of the work is done in collaboration with over a hundred outstanding particle physicists and astrophysicists from throughout the world. In addition the PDG is in frequent contact with 700 leaders of particle physics experiments. The PDG work is the product of efforts by a large fraction of the entire particle physics community. Quality is maintained in part by yearly meetings of an international advisory committee.

Collaborative distribution of effort has enabled the PDG to manage the growing body of literature in the field and to enhance and expand coverage over the past fifteen years, which has seen a tripling of the number of papers added to each edition, and a tripling of the number of reviews. The most recent edition had 1900 new measurements from 700 papers, in addition to the existing 14,000 measurements from 4000 papers. Each new edition is eagerly awaited by the particle physics community, as evidenced by big jumps in the usage of the PDG website.

High-energy physics' strong tradition of international collaboration has been an effective model for efforts such as SPIRES-HEP and the Particle Data Group, enabling them to manage increasing work loads cost effectively, take advantage of distributed, specialized expertise, and continue to create useful and freely accessible research support tools for the particle physics community. Both of these collaborations are made possible not only by the institutional commitments of many organizations but by the personal effort and dedication of individual physicists and support staff who give their time for the good of the entire community.

Most Cited Particle Physics Publication

A search in the SPIRES-HEP database to discover how many times the various editions of the Particle Data Group's *RPP* has been cited shows that it is the most heavily cited publication in particle physics. Since 1974 the total for all editions of the *RPP* is an impressive 10,123 citations. The most recent edition (below) is supplemented by web-accessible updates of the reviews, tables, and plots and the 1997 Particle Listings.

Review of Particle Physics by the Particle Data Group, R. M. Barnett, C. D. Carone, D. E. Groom, T. G. Trippe, C. G. Wohl, B. Armstrong, P. S. Gee, G. S. Wagman, Lawrence Berkeley National Laboratory; F. James, M. Mangano, K. Monig, L. Montanet, CERN; J. L. Feng, H. Murayama, LBNL and UC, Berkeley; J. J. Hernandez, Valencia University; A. Manohar, UC, San Diego; M. Aguilar-Benitez, Madrid, CIEMAT, and CERN; C. Caso, Genoa University and INFN, Genoa; R. L. Crawford, Glasgow University; M. Roos, N. A. Tornqvist, Helsinki University; K. G. Hayes, Hillsdale College; K. Hagiwara, K. Nakamura, M. Tanabashi, KEK; K. A. Olive, Minnesota University; K. Honscheid, Ohio State University; P. R. Burchat, Stanford University; R. E. Shrock, SUNY, Stony Brook; S. Eidelman, IYF, Novosibirsk; R. H. Schindler, SLAC; A. Gurtu, Tata Institute; K. Hikasa, Tohoku University; G. Conforto, Urbino University and INFN Florence; R. L. Workman, Virginia Tech; C. Grab, ETH, Zurich; C. Amsler, Zurich University; July 1996, 720 pp.

Formerly titled *Review of Particle Properties*, Published in *Phys. Rev.* D54, 1-720 (1996). *The 1996 Review of Particle Physics* with 1997 updates is available on the web at http://pdg.lbl.gov/pdg.html.

Two popular compilations based on the SPIRES-HEP database's citation searching feature, the "Top-Cited HEP Articles, 1998 Edition" and the "All-Time HEP Favorites: 1998 Edition" are being edited by Michael Peskin of SLAC and will soon be available at http://www-spires.slac.stanford.edu/FIND/spires.