

EPS Prize to Gargamelle Collaboration for the Weak Neutral Current

The European Physical Society High Energy and Particle Physics Division awards prestigious prize to CERN collaboration

The prestigious EPS High Energy and Particle Physics Prize is this year awarded to the Gargamelle collaboration, for the "observation of the weak neutral current interaction" in 1973. The award ceremony takes place at the EPS-HEP conference in Krakow, July 20, <http://www.ifj.edu.pl/hep2009/>

The Gargamelle detector was a big bubble chamber containing 12 cubic meters of liquid freon (a coolant), ideally suited to search for rare interactions in a neutrino beam at CERN. The theory unifying weak and electromagnetic interactions, which had been proposed only a few years before, by S. Glashow, A. Salam and S. Weinberg, predicted new kinds of neutrino interactions, caused by the exchange of neutral particles (the so called neutral current interactions). After a beautiful, but not yet conclusive, hint of such interactions involving electrons in the freon, convincing evidence was established in so-called hadronic events, where the neutrinos scattered from atomic nuclei in the liquid freon.

This discovery is considered by many as the most important one ever made at CERN. After some discrepancy with a competing American experiment was settled in favour of Gargamelle, it quickly led to the acceptance of the electroweak theory, and Nobel prizes were awarded to Glashow, Salam and Weinberg in 1979.

The crucial paper establishing the observation was signed by 55 physicists, from groups at Aachen, Brussels, CERN, Paris, Milano, Orsay and London. Many of these will come to Krakow to celebrate with colleagues they have not seen for many years. The prize will be collected by A. Pullia from CERN (now in Milano) and J.P. Vialle from Orsay (now at Annecy).

The neutral current interaction is similar to electromagnetism, but much more feeble at low energies, and it distinguishes left and right. It is the central pillar of our understanding of the unification of electromagnetism with the weak interactions, a tapestry that may be completed by the discovery of the Higgs particle at the LHC.

Professor Fabio Zwirner, a member of the EPS-HEPP Board from the University of Padova, said "After more than 36 years, the weak neutral current is still the junior member of the exclusive club of experimentally established fundamental interactions: celebration is overdue, now that new members may soon be admitted by the LHC".

Professor Stefan Pokorski, from the University of Warsaw, added "Our Committee rewards a milestone experimental discovery in the physics of elementary interactions, a benchmark to full understanding of the phenomenon of radioactivity, observed more than hundred years ago by Henri Bequerel, Maria and Pierre Curie and Ernest Rutherford".

Source: Professor Per Osland, chair of the EPS High Energy Particle Physics Division Board.