

*Oft, wenn es erst durch Jahre durchgedrungen,
Erscheint es in vollendeter Gestalt.
Was glänzt, ist für den Augenblick geboren;
Das Echte bleibt der Nachwelt unverloren.*
J.W. von Goethe, *Faust, Vorspiel auf dem Theater*, 71–74 (1790).

EDITORIAL

In 2000 the LEP e^+e^- collider at CERN had been running constantly above 200 GeV center of mass energy, reaching for a short time the record energy of 209 GeV, and again the Standard Model has survived well the precision tests at this new high energy frontier. Possible signals of the long awaited Higgs boson have perhaps been detected around a mass of 115 GeV in some of the data, but the overall significance is at present slightly below three sigmas. An additional 230 pb^{-1} integrated luminosity has been collected by the four experiments in 2000, reaching an overall integrated luminosity at energies above the WW threshold of about 700 pb^{-1} . This has allowed a precision measurement of the W mass. New particles, in particular manifestations of supersymmetry, have been systematically searched for, and none was found, with exclusion limits in some cases close to the kinematic limit. LEP operation terminated in November 2000, four years later than the termination of the SLC, to leave space to the preparation of the LHC which will presumably start operating in 2007.

The legacy of these e^+e^- machines and of their experiments is outstanding. We learned a lot from the operation of the machines in terms of the design and development of future facilities. In many areas of high energy physics the LEP/SLC experiments have improved the precision of the measurements by orders of magnitude. The progress largely exceeded the expectations in the electroweak precision measurements, in QCD, in heavy flavour physics and in the search for new particles. In some cases what was before the LEP/SLC era a hint of an agreement with the SM, has been pinpointed down. Astonishingly enough the experimental results were and are almost universally in agreement with the simplest version of the SM. There were some anomalies presented at times, but they were not confirmed by other experiments, and they disappeared with more statistics. In the end, when scanning the region of electroweak unification no unexpected physics result did materialize, with the exclusion of a faint glimpse of the Higgs particle, and of the discrepancy between the leptonic and hadronic asymmetries at the Z^0 which could point to new physics: both these findings should wait for another machine and other experiments to be proven or disproven, and this will take many years.

The 7th Topical Seminar on the Legacy of LEP and the SLC was held in Siena from 8 to 11 October 2001 in the Aula Magna of the University. The conference started with a session on historical recollections, comprising the physics issues discussed on several occasions, and the performances of the machines, both LEP and SLC, over the years. The rest of the conference was devoted mainly to presentations covering the latest results in the analysis of LEP/SLD data, and their theoretical interpretation, with emphasis both on precision measurements, and on searches for new particles and new interactions. Whenever relevant for these topics, data from Fermilab and DESY were also discussed. Recent results in the field of CP violation were presented, both at fixed target, and at B factories; the progress with Daphne was also presented. The conference was completed by presentations of the legacy of LEP/SLC in terms of detector evolution, of the future physics at LHC, of the present and future neutrino physics, of the search for the cosmological constant, and of the search for WIMPS, both at underground laboratories and in space. We came back to history with a beautiful talk by Cecilia Jarlskog on the number of neutrino families on the last day of the conference.

The conference programme comprised 60 talks. The meeting was attended by more than 80 physicists, representing 45 institutions, and coming from 11 different countries.

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