

LEP1: the Ascent of the Standard Model

Tuesday, 16 September 2014 15:45 (45 minutes)

Abstract

When LEP was conceived, the Standard Model was not a phrase that appeared in the titles of particle physics papers. By the end of LEP1, the Standard Model had been established as the theory describing the visible matter in the Universe. In addition to testing the Standard Model, the accurate measurements at LEP1 enabled predictions to be made for new physics, such as the masses of the top quark and the Higgs boson, and provided a hint for possible physics beyond the Standard Model, such as grand unification.

Career summary

John Ellis is Maxwell Professor of Theoretical Physics at King's College in London. After obtaining a PhD from Cambridge University and post-doctoral positions at SLAC and Caltech, he worked at CERN from 1973 to 2011, where he was Theory Division Leader for six years. He was awarded the Maxwell Medal (1982) and the Paul Dirac Prize (2005) by the Institute of Physics. He was elected Fellow of the Royal Society of London in 1985 and of the Institute of Physics in 1991, and holds seven honorary doctorates and fellowships.

His research is on many areas of elementary particle physics and its connections with astrophysics, cosmology and quantum gravity. Much of his work relates directly to experimentation: interpreting the results of searches for new particles and exploring the physics that could be done with future accelerators. A proposal he made in 1976 led to the discovery of the gluon in 1979 and he was one of the first to study how the Higgs boson could be produced and discovered. He has authored nearly a thousand scientific papers, with over fifty thousand citations in total. He is currently very active in efforts to understand the Higgs particle discovered recently at CERN, as well as its implications for possible new physics such as dark matter. He participated in the pioneering studies of possible physics with LEP, the LHC and CLIC and is now studying the physics possible with future large electron-positron and proton-proton particle accelerators.

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