

Optics Journal: Editorial

Published 2012/09/21
©Optics Journal (2012)

ISSN: 1936-9808

The triumph of the Higgs boson

At first with some reluctance, but then with more confidence, physicists from CERN have told us that a new elementary particle has been discovered. This new particle is said to be most probably a zero spin particle. This particle is also said to be electrically neutral and to couple to other massive particles. This new particle is said to be a boson. Moreover, the production and decay rates of this boson are said to be consistent with the predictions of the Standard Model. As a whole, this new boson behaves in a manner consistent with the predictions of the Standard Model for the *Higgs boson*.

Predicted in the mid 1960s by Higgs, and others, the Higgs boson is a child of the Standard Model, a theory that began taking shape in the late 1950s and early 1960s. In turn, the Standard Model is based on the quantum mechanics of the mid 1920s, the quantum mechanics of Heisenberg, Schrödinger, and Dirac. The same quantum mechanics that gave us the laser, the transistor, and thus the foundations of the brave technological advances we enjoy today (internet, iphones, *et al.*). Here, it should be noted that the great two pillars of our present day technology are: electromagnetisms and quantum mechanics.

Thus, in all probability, it appears that physics is about to witness one of its greatest triumphs. And if it does not turn out to be the Higgs boson, as predicted by the Standard Model, then we'll be confronted with new physics, an even greater gift.

From a personal perspective, this observer was very fortunate to have shared some physics and time with John Ward (one of the creators of the Standard Model) and with his close friend Dick Dalitz (creator of the *Dalitz plots*, a technique crucial to the discovery of new particles, such as the Higgs boson). The celebrations would have been more meaningful if they were here.

F. J. Duarte