

On the origin of elementary particle masses :

The history and scope of a discovery

Abstract

I will first discuss the emergence in human history of the vision of the world uncovered by fundamental research in physics and how it rapidly lead to an understanding of the forces directly perceived at our scale.

This will bring us from the Renaissance to the middle of the 20th century. I will then explain how the theory of the origin of elementary particle masses, confirmed by the CERN discovery of the Brout-Englert-Higgs boson and rewarded by the 2013 Nobel Prize, prepared the emergence of the Standard Model of elementary particles. I will describe the Model, show how it delineates the known from the unknown and how it questions the unknown, both at the small scale of elementary particle and at the large scale of the universe.

I will conclude by comments on the impact of fundamental research.

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