

Guido Tonelli

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Guido Tonelli (born 1950) is an Italian particle physicist. He is one of the main protagonists of the discovery of the [Higgs boson](#) at the [LHC](#).^[1] He is a professor of General Physics at the University of Pisa (Italy) and a CERN visiting scientist.

Biography

He was born in [Casola in Lunigiana](#), Italy, on November 8, 1950. He received his degree in [physics](#) in 1975 at the University of [Pisa](#), Italy where he becomes professor in 1992. Since 1976 he works in the field of [high energy physics](#), participating in [CERN](#) experiments NA1, NA7 and [ALEPH](#), and in the [CDF](#) experiment at [Fermilab](#), [Batavia](#) (IL-USA). Among his contributions there are the first precision measurements of the lifetime of charmed mesons, precision tests of the [Standard Model](#) of the fundamental interactions, search for the [Higgs boson](#), and for various signatures of [Supersymmetry](#) or new physics beyond the [Standard Model](#).

Since the beginning of the '90 his activity is mainly devoted to the [Compact Muon Solenoid](#) (CMS), experiment proposed for the [Large Hadron Collider](#) (LHC) at CERN, Geneva, (Switzerland). He participates in CMS since the conceptual design contributing with the original idea of a central tracker fully based on [semiconductor](#) devices.^[2] He is elected as CMS Spokesperson for the years 2010-2011.^[3]

On December 13, 2011, together with [Fabiola Gianotti](#), [ATLAS](#) Spokesperson, he presents in a special seminar at CERN the first evidence of the presence of the [Higgs boson](#) around a [mass](#) of 125 [GeV/c²](#).^[4] The 125GeV signal appears again in the new data collected in spring 2012, and, combining the 7 TeV 2011 data with the 8TeV, 2012 data, the statistical significance of the signal reaches the conventional 5 sigma threshold needed to announce a new discovery. Therefore, on July 4, 2012, the ATLAS and CMS experiments announce formally the observation of a new Higgs-like boson at LHC.^[5]

On March 14, 2013, new results presented by ATLAS and CMS at the Moriond Conference in La Thuile confirm that all observations are consistent with the hypothesis the observed particle being a (or the) Standard Model Higgs boson.^[6]

Thanks to this discovery, on October 8, 2013 the [Nobel Prize](#) in Physics 2013 is assigned to [François Englert](#) and [Peter Higgs](#) with the motivation "for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle, by the ATLAS and CMS experiments at CERN's Large Hadron Collider"^[7]

Awards

- On October 24, 2012, [Giorgio Napolitano](#), President of the Italian Republic, awards him the honour of [Commendatore](#) of the Order of Merit of the Italian Republic for his contribution to the discovery of a new, Higgs-like particle at the LHC.^[8]
- On December 11, 2012, he was awarded the 2012 Special [Fundamental Physics Prize](#)^[9] "for his leadership role in the endeavour that led to the discovery of the new Higgs-like particle by the ATLAS and CMS collaborations at the LHC".
- On July 23, 2013, he was awarded the 2013 [Enrico Fermi Prize](#) of the Italian Physics Society. The Society awarded the prize "to Guido Tonelli for the discovery, with the CMS experiment, of a new fundamental particle with mass around 125 GeV and properties consistent with a Higgs boson, theoretically predicted almost 50 years ago, the existence of which ensures a huge insight in the understanding of the Standard Model of particle physics".^{[10][11]}
- In 2014, he has received the highest honors of the City of Pisa within the "Celebrations for the 450 Years from the birth of Galileo Galilei". On March 11, 2014 he was awarded the Silver Tower^[12] and on October 24, 2014, the Medal of Honor of the President of the Republic, [Giorgio Napolitano](#).^[13] According to the motivations the prizes were awarded " to Guido Tonelli, key protagonist of the discovery of the Higgs boson, that led the 2013 Nobel Prize in physics to Francois Englert and Peter Higgs. Guido Tonelli, CERN scientist and Professor of the University of Pisa, is the last example of a tradition of excellence that started with Galileo Galilei and proceeded with Enrico Fermi, Bruno Pontecorvo and Carlo Rubbia".