

A.Nisati and G.Tonelli “The Discovery of the Higgs Boson at LHC”



А. Нисати



Г. Тонелли

Внимание читателей предлагается переведенная на русский язык статья известных итальянских физиков, ярких представителей коллабораций ATLAS и CMS на LHC, сыгравших ключевую роль в открытии новой частицы — бозона Хиггса на Большом адронном коллайдере, опубликованная в “La Rivista del Nuovo Cimento”.

А. Нисати, Г. Тонелли / Открытие бозона Хиггса на Большом адронном коллайдере

ФИЗИКА НА LHC

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Presentation of Russian edition of Book

A.Nisati and G.Tonelli “The Discovery of the Higgs Boson at LHC”

The Book translated to Russian and published in agreement with Editorial Board of the “La Rivista del Nuovo Cimento”, according to the decision of the RDMS CMS Collaboration and JINR Directorate.

Translated by I.Gorbunov, with participation of S.Shmatov and A.Zarubin

The Book is written by famous Italian physicists – outstanding members of the ATLAS and CMS Collaborations played a key role in the discovery of the Higgs Boson at the LHC, published in “La Rivista del Nuovo Cimento” (2015. v.38, Ser.5, Num.11. p. 507–573).

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Alessandro Nisati is a Research Director at the Istituto Nazionale di Fisica Nucleare (Sezione di Roma, I).

His scientific production is fully dedicated to experiments performed at CERN. Nisati started his activity in UA1 experiment at the SppS collider, and had a significant role in the WA92/Beatrice fixed target experiment.

Most of his scientific career has been devoted to the development of proton-proton (pp) collision physics programme of the Large Hadron Collider (LHC), pioneering muon trigger and muon precision measurement studies, as well as the preparation of physics analyses for Higgs boson searches at the LHC. He had an **important role in the foundation of the ATLAS experiment.** During the preparation phase, he performed important tasks giving major contributions to the detector design and study in test beam experiments, and as co-convenor of the Higgs Group.

After the startup of LHC, Nisati was elected **Physics Coordinator by the ATLAS Collaboration.** He guided the analyses of the data collected by the experiment during the first two years of operations. **Nisati's role was important in particular during the period that led to the discovery of the Higgs boson announced by ATLAS and CMS in July 2012.** Afterwards, he had a prominent role in the first studies on the properties of this new particle.

At present Nisati is engaged in the luminosity upgrade of the ATLAS experiment.

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Guido Tonelli is professor of General Physics at the University of Pisa (Italy) and a CERN visiting scientist.

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 SM of the fundamental interactions, search for the Higgs boson, and for various signatures of Supersymmetry or new physics BSM. **He participates in CMS since**

the conceptual design contributing with the original idea of a central tracker fully based on semiconductor devices. He is elected as CMS Spokesperson for the years 2010-2011.

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. This 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.

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.