

#EPSHEP2017
#PhysicsInVenice

Yesterday in short

Five years after the Higgs discovery ATLAS and CMS have studied much more in details the properties of this particle that seems really the Standard Model Higgs. A comprehensive review of the Higgs properties as expected by the Standard Model and measured by ATLAS and CMS have been presented. For the ATLAS collaboration a first evidence of the Higgs to $b\bar{b}$ decay, determined relative to the $Z \rightarrow b\bar{b}$ decay used as standard candle was reported. The same decay channel is studied by CMS, as shown, by using boosted $H \rightarrow b\bar{b}$, via a new technique that identifies two b-jets in a single "fat" jet. CMS has reported also the most precise determination of the Higgs mass by using the Higgs to four leptons decay. Nevertheless, more precision is needed in order to constrain the new particle to the Standard Model Higgs and a clear roadmap has been defined: it goes from precision to known unknowns and unknown unknowns! ATLAS experiment has shown several new measurements: W boson mass determination and several searches for new physics beyond SM. CMS collaboration presented the detector improvements, of particular importance the upgraded silicon vertex detector whose performances have been shown. The determination of the electroweak mixing angle is the most precise measurement at LHC with a precision similar to the TEVATRON one.

The afternoon session opened by reminding the discovery of the first gravitational wave by advanced LIGO. An overview of the history, status and perspectives of the gravitational wave searches using interferometry was done. LIGO and VIRGO have been upgraded and now new players are entering in the game: KAGRA, in Japan, LIGO in India and the LISA 3 satellites space project. Again linking particles and cosmo, the session focused on the connections between the Higgs and the hidden sector, dark matter and inflation. Higgs portal dark matter means a viable WIMP, and the Higgs-inflation interaction is crucial. Experimental results, with a summary of the main ATLAS, CMS, LHCb, and D0 measurements of electroweak and top physics were presented. Underlying how much important is to test the SM, an astonishing number of results, including the first LHC measurement of the W-mass was presented, a new top quark pole mass measurement from ATLAS, new $\sin^2(\theta_W)$ measurements from D0, Tevatron average and CMS and many many others. Then, the discussion focused on whether the SM is really carved in stone. The impression is that New Physics is hiding in small and subtle effects, which makes high precision measurements absolutely needed, which has to come also from theory. Top physics, a booming topic, is more and more involving discussions outside the QCD community. The nearest future of this field should hopefully bring high-precision predictions in decaying top-quarks modeling, at least in the narrow-width-approximation. The last talk of the afternoon discussed the information paradox, which pops out when one

Today's highlights

Plenary Sessions

MORNING SESSION

Sala Grande, Palazzo del Cinema
The first part of the morning will start with highlights from the LHCb experiment and will be dedicated to flavour physics: rare decays and exotic states in quark flavour physics; CP violation and CKM physics; flavour physics theory. In the second part of the morning, searches for supersymmetry and exotica will be discussed, and high-energy astroparticle physics will be presented with focus on direct high-energy cosmic ray measurements and high energy cosmic gamma rays.

AFTERNOON SESSION

Sala Grande, Palazzo del Cinema
The afternoon plenary talks will be focused on neutrinos and dark matter, from both experimental and theoretical point of view. Neutrino astrophysics. Neutrino physics from natural and reactor beams. Neutrino physics from particle beam and decay experiments. Theory and phenomenology of neutrinos. Direct searches for dark matter. A theoretical overview of dark matter. Axions: from the QCD to the dark universe.

Photo Shots



Events

*Today, at the end of the afternoon session, all participants are invited for a group photo shot. We'll all meet in front of Palazzo del Casino at around 6.30 pm.

*Today at 8pm the Grand Hotel Excelsior Restaurant will be the venue of the elegant social dinner, at the beautiful "Sala Stucchi" with the sea view and the delicious Italian Cuisine. Coupon to be exhibited at the entrance, sharply at 8pm. After dinner, by the terrace near the open swimming pool the social entertainment continues with music and dancing in a very friendly and joyful atmosphere (drinks at participant charge).

[Click on the pictures for videos and more multimedia contents.](#)

People



Interview with Erik H. M. Heijne, EPS HEPP Prize Winner



Interview with Barry C. Barish, EPS Cocconi Prize Winner



Interview with Karl Jakobs, ATLAS Spokesperson

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The EPS HEP 2017 scientific secretaries. The EPS HEP 2017 Local Organizing Committee. With the contribution of Marina Cobal, Donatella Lucchesi, Nadia Pastrone.



THE BAR AT THE BEGINNING OF THE UNIVERSE

LUCA RALLI

