A CUP OF PHYSICS
DAILY NEWSLETTER FROM EPS HEP2017
Wednesday 12 July 2017

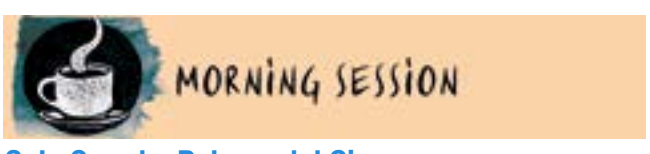
#EPSHEP2017 #PhysicsInVenice

Yesterday in short

Besides the high-energy frontier, another promising route to unreveal new physics manifestations is provided by the high-intensity frontier, looking for the influence of heavy particles to lower energy processes produced at high rate, such as beauty hadrons. An overview of so-called anomalies in the B flavour sector has been given. Complementing hints of non-universality of lepton couplings seen by LHCb, with other related anomalies in the B flavour sector observed by LHC experiments and B factories, a tantalizing picture seems to appear, although it was made clear that more data are needed. It was also discussed how theorists are at work to define sensible new physics models that could embrace all the measurements of such anomalies performed by experiments. Concerning more traditional B physics measurements, the LHCb experiment presented a new determination of the gamma angle of the unitarity triangle, and we are quickly approaching the day when gamma will not be the least known angle of the unitarity triangle anymore. One of the breaking news of this year's EPS HEP has been the observation of the Xicc++ by LHCb, a particle composed of two charm quarks and a light quark. A rich programme of research in the sector of doubly heavy baryons is now starting. New Physics could be reached studying invisible and exotic decays in the Higgs sector, where searches for BSM Higgs are performed. A large variety of searches starting from SUSY and exploring resonances sensitive to BSM and DM models as WIMPs are complemented by long-lived particles searches. No significant excess has been seen in data but sophisticated and ingenious techniques were put in place by experiments to explore a plethora of theories and models. Space station based AMS experiment discussed its intriguing positron spectrum. Conventional astronomical sources cannot explain the measured spectrum while DM does. Unfortunately several new models, taking into account other astrophysical sources or secondary emissions can fit the spectrum as well. A different messenger, high energy gamma rays, have been then discussed. In the past years both ground and space based experiments provided many wonderful results about astronomical sources and fundamental physics. The next generation ground based experiment CTA is in an advanced preparation phase in two sites: a southern one in Chile and a northern one at Canary Islands, Spain.
Neutrino astronomy is now a reality and Ice-Cube, together with Antares, is providing interesting results on point sources and galactic plane. Super-K and Ice-Cube are setting stringent limits to spin dependent Dark Matter candidates in the low mass region. KM3NeT will soon become a competitive player. Long baseline neutrino experiments T2K and Nova are improving their results and both favour CP violation and normal neutrino mass ordering. Their ambitious follow-up, Hyper-K and Dune, are planning to be ready in 10 years. Several experiments (Kamland-Zen, Exo, Gerda, etc.) are taking data in their searches for neutrinoless double beta decays, with the ambitious Cuore experiment at LNGS in the commissioning phase. Sterile neutrinos are under siege. Icarus is approaching Fermilab where it will complete a powerful setup for a short baseline neutrino oscillations search. Source experiment CeSOX, using Borexino (LNGS) as detector, is in an advanced stage of preparation. Several very short baseline reactor experiments just started data taking or are almost ready to start. The three powerful reactor experiments Double Chooz, Reno and Daya Bay provided a remarkable precise measurement of the oscillation parameter θ13, limits on sterile neutrinos and a clear evidence of lack of understanding of the reactor neutrino fluxes. Next generation Juno experiment will hopefully start data taking around 2020. A nice review of neutrino theory and phenomenology was given from remote because the speaker has become the father of two twins yesterday. The most stringent limits from direct DM Wimp candidates searches are coming from the Xenon experiment at LNGS. In the medium term the scene will be dominated by double phase liquid noble gas experiments like Xenon, Luz and Dark Side. Axions are a popular alternative to Wimps as DM candidates, cavity experiments are on the run and new techniques are blooming, stimulating an intense R&D activity.

Today's highlights

Plenary Sessions



Sala Grande, Palazzo del Cinema
The morning will be dedicated to heavy ion physics and cosmology. During the first part, highlight from the ALICE experiment at LHC. Flavour production, quark gluon plasma, jets and particle correlations in heavy ion collision. An overview of 30 years of heavy ions and outlook. After the coffee break, comic microwave background, dark energy surveys and the cosmological standard model.

Sala Grande, Palazzo del Cinema
To move towards the end of this great conference, a look into the future physics. Susy and Beyond Standard Model theory after LHC 2016. Detector R&D both for collider and underground experiments. Future accelerator machines and R&D. After the coffee break the very conclusion: highlights from this EPS HEP 2017 conference and outlook. Announcement of EPS HEP 2019 and closing!

Photo Shots

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The EPS HEP 2017 scientific secretaries.
The EPS HEP 2017 Local Organizing Committee.
With the contribution of Mauro Mezzetto, Nadia Pastrone, Vincenzo Vagnoni.

Practical information

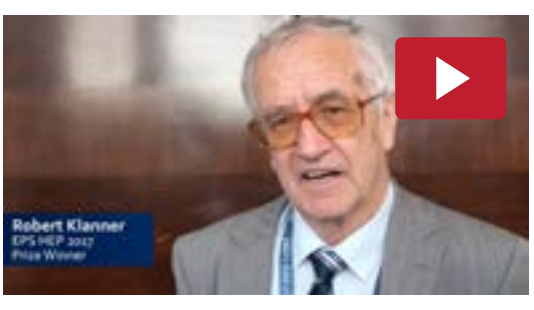
*If you need to print any documents or your boarding pass, please ask the reception desk in advance, in order to do it on time.

*You can store your luggage at the reception desk.

Click on the pictures for videos and more multimedia contents.

People

Interview with Federico Antinori, ALICE Spokesperson



Interview with Robert Klanner, EPS HEP 2017 Prize Winner

Interview with Fabiola Gianotti, CERN Director - General

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