**EPSHEP2017**

**PhysicsInVenice**

INFN Communication Office

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Editorial Board:

**Photo Shots**

**Plenary Sessions**

**Today's highlights**

Experiments are on the run and new techniques are blooming, stimulating an intense R&D activity.

Experiments like Xenon, Luz and Dark Side. Axions are a popular alternative to Wimps as DM candidates, cavity two twins yesterday. The most stringent limits from direct DM Wimp candidates searches are coming from the sensitivities of the experiments.

Neutrino theory and phenomenology was given from remote because the speaker has become the father of neutrino fluxes. Next generation Juno experiment will hopefully start data taking around 2020. A nice review of reactor experiments Double Chooz, Reno and Daya Bay provided a remarkable precise measurement of the very short baseline reactor experiments just started data taking or are almost ready to start. The three powerful sources and galactic plane. Super-K and Ice-Cube are setting stringent limits to spin-dependent Dark Matter sources and galactic plane. The next generation northern one at Canary Islands, Spain.

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. A different messenger, high energy gamma rays, have been then discussed. In the past years both ground and space based experiments have found many wonderful results about astronomical sources and fundamental physics. The next generation of gamma telescopes will be able to detect gamma-ray bursts from core-collapse supernovae and GRBs from relativistic jets. A new generation of very large telescopes is expected to improve the current sensitivity by an order of magnitude.

Other astrophysical sources or secondary emissions can fit the spectrum as well. A different messenger, high energy cosmic rays, have been also discussed. The cosmic ray spectrum is a key probe of astrophysical particle acceleration, propagation and secondary interactions. During the past year, high-multiplicity events in the cosmic ray shower were observed by several experiments with different detector geometries. The high-energy cosmic-ray physics community is working together to understand cosmic-ray spectra in a consistent framework.

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Sterile neutrinos are under siege. Icarus is a new attempt to study the nature of neutrinos through high-energy neutrino astronomy. The neutrino energy spectrum and angular distribution are sensitive probes of neutrino physics. The Icarus experiment is a high-resolution neutrino telescope designed to measure the neutrino energy and angular distributions from atmospheric neutrinos. A recent analysis of the Icarus data has shown that the neutrino energy spectrum is consistent with the Standard Model predictions for neutrino oscillations.

Many of the scientific highlights of EPSHEP2017 were related to the Standard Model and the search for new physics manifestations. One of the breaking news of this year’s EPS HEP has to do with the discovery of CP violation in the B sector of the Standard Model. CP violation is a fundamental property of the Standard Model and is responsible for the asymmetry between matter and antimatter in the universe. The discovery of CP violation in the B sector has opened up a new avenue for the search for new physics beyond the Standard Model.

Concerning more traditional B physics measurements, the LHCb experiment presented a new determination of the CKM matrix parameter sin^2θ_13. The result is consistent with the previous measurement and is in excellent agreement with the theoretical predictions. The LHCb experiment is a key instrument for the study of B meson decays and the search for new physics manifestations. The recent measurement of sin^2θ_13 is a significant step forward in the understanding of the Standard Model and the search for new physics.

Besides the high-energy frontier, another promising route to unveil new physics manifestations is provided by the search for long-lived particles. No significant excess has been seen in data but sophisticated analysis and ingenious techniques were put in place by experiments to explore a plethora of theories and models. Space experiments are complemented by long-lived particle searches. No significant excess has been seen in data but sophisticated analysis and ingenious techniques were put in place by experiments to explore a plethora of theories and models. Space experiments are complemented by long-lived particle searches. No significant excess has been seen in data but sophisticated analysis and ingenious techniques were put in place by experiments to explore a plethora of theories and models.

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