

Daily Newsletter – Monday, 27 July

We turn from the parallel mode to the plenary sessions. Following are today's highlights, including our live webcast:

<http://eps-hep2015.eu/live-webcast>

The EPS-HEPP Prize Goes to...

The first highlight of the day is the prize ceremony. The HEPP prize goes to a group of five theorists – G. Altarelli, J. Bjorken, Y. Dokshitzer, L. Lipatov, G. Parisi – for their ground-breaking work on the proton structure. The Cocconi Prize will be awarded to F. Halzen for his leading role in neutrino astrophysics and the discovery of very high energy extraterrestrial neutrinos by IceCube.

There are two prizes for young physicists.

One is for outstanding achievements in experimental research, and is shared this year by two physicists:

J. Grosse-Oetringhaus, G. Petrucciani. The other prize, the Gribov Medal, goes to P. Vieira for impressive contributions to formal field-theory. Finally, the important outreach prize will be awarded to K. Shaw for her unique and successful efforts to bring the International Masterclasses to developing countries.

LHC

The Large Hadron Collider is restarting in a new energy range after its long shutdown. There will be a report on its status and plans for future upgrades.

Higgs and New Physics

There is a review of our current experimental understanding of the Higgs boson three years after its discovery. In addition, the latest results of searches for Higgs physics beyond the Standard Model are presented. The discovery of the Higgs boson and the measurement of its properties have deep implications on what nature should look like

at very short distances, i.e., at very high energies to which we do not yet have direct access. These implications are discussed, together with the prospects of learning more at the LHC and future colliders.

Top and Electroweak Physics

There are two plenary presentations giving an overview on the current status of the fields of electroweak physics and the physics of the top quark. During Run I data taking period the LHC experiments have taken the leadership in the exploration of the TeV scale electroweak Standard Model (and beyond) physics. In particular the fact that a pp collider behaves as a "Vector-boson-collider" was demonstrated and opens a huge field of studies of the interplay between Vector-boson scattering unitarization and Electro-Weak symmetry breaking mechanism. First results from Run II (July 2015) will be shown to confirm that the journey is restarting. There is also a plenary presentation dedicated to the theoretical aspects and methods that are required to interpret and understand the wealth of data obtained at particle colliders such as the Large Hadron Collider. This covers the strong nuclear, the weak as well as the electromagnetic forces.

String Theory and Lattice Gauge Theory

The very last two plenary talks in the afternoon will survey recent developments in string theory and lattice gauge theory: Freddy Cachazo from the Perimeter Institute will speak about string theory and Ruth van de Water from Fermilab about lattice gauge theory.

Public Events

The program will start at 18:00 with a Symposium on Art and Science. The vernissage of the three exhibits takes place under the arcades of the University. Following that will come the first edition of the Physics Slam, starting at 19:30 at the Audimax. [Physicists introduce EPS 2015 talks](#) in three minutes on stage. The audience selects the winner.

Social Events

Those who got tickets will enjoy a classical concert under the impressive fresco of the Austrian Academy of Science Festsaal.

“Be ambitious and persevering”

We met with Kerstin Borrás, deputy spokesperson for the CMS experiment, and Andreas Hoecker, physics coordinator for the ATLAS experiment, for a brief chat. Both experiments have been presenting the results from the early data of the LHC’s Run 2 at EPS HEP 2015.



What was the most challenging aspect of preparing for EPS HEP 2015?

KB: To have results without our magnet switched on as we are still working on detector maintenance, especially our cryogenic system. The greatest challenges though are unexpected. You plan as much as possible but things change. We worked day and night to get new results.

AH: We wanted to have early data results. Many huge changes were made during Long Shutdown 1, including installing a new

detector, the Insertable B-Layer. Commissioning it was a challenge. Changes were also made in computing, software and analysis models were revamped. Initial running of the detectors while producing new physics results is not easy but we managed it.

What was a lesson learned or the most difficult thing you’ve done in your career?

KB: I learned that underlying events with very low energy can mimic a lot of fake signals. I first saw this while working on the CDF experiment and found them very interesting. When I joined CMS, I wanted to continue with measurements at low energy.

AH: The most difficult thing I’ve done is working as a physics coordinator in a large experiment like ATLAS and trying to really make sure that all the young people have visibility not only inside the collaboration but also in the larger community. It is important to properly represent those working on data analysis, detector and computing. I want everyone to feel ownership of the result.

What is your advice for young physicists?

KB: Work on all aspects of physics if possible – detector, data analysis, but always keep in mind the physics goals of the experiment you are working on. Teamwork is very important, as is communicating clearly within the team.

AH: Be ambitious and persevering. Find the most difficult topic that is important for the experiment and be creative. Creativity is the most important part and one that makes your work a happy one.

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