



The Standard Waffle



Daily EPS-HEP 2019 Newsletter

Tuesday 16 July 2019

With our second day of plenaries, we switch to a variety of topics, from flavour physics, over neutrinos to astroparticle physics and more. Along with our usual segments, we also look back to the other social activities that took place during the weekend.

Today's programme

The morning plenary session will start with reviews of flavour physics, CP violation, rare decays, and highlights from the LHCb and Belle II experiments. Gravitational waves, cosmic rays, and multimessenger astroparticle physics will close the morning programme.

In the afternoon, neutrinos and dark matter will take the stage. Theoretical and experimental reviews of neutrino physics, dark matter, and axion searches will conclude today's physics programme.

At the end of the afternoon session, few minutes after 18:00, buses will pick us up from the entrance of the ICC to take us to the quaint *Eskimofabriek* for the conference dinner.

Highlights from Monday

The plenary sessions kicked off yesterday with a warm welcome by the conference organizers, the Dean of the faculty of Sciences, and the vice-rector of Ghent University. Next, the High-Energy and Particle Physics division of the EPS held its prize ceremony, awarding outstanding achievements in various areas.

Next, an impressive set of new results of the ATLAS and CMS Collaborations using the full Run II data sets were presented. The emphasis was naturally put on the most recent Higgs measurements, showing the enormous progress made by the two experiments since the Higgs discovery. Promising results on the couplings of the Higgs boson to quarks and leptons of the second generation are now available, even if more data will be needed to reach the sensitivity to test the SM couplings.

Additionally, many other important results on a broad range of physics topics have been highlighted, including electroweak measurements involving vector bosons and the top quark. It is also interesting to note that both experiments are now exploiting innovative data analysis methods and techniques, including scouting, data parking and machine learning, to maximize their discovery potential.

More new LHC results were provided in the afternoon talks dedicated to measurements of SM observables, and searches for supersymmetry and exotica. New results and future prospects were put into a theory perspective. We may not have seen supersymmetry yet, but those who joined the concert on Friday have heard its tune already.

Precision calculations in the standard model are becoming increasingly sophisticated, with conceptual and technical solutions drawing from recent developments in formal theory and pure mathematics. BSM physics is broadening its theoretical viewpoints to embrace a multitude of possible scenarios, opening up new perspectives and observables. Especially in the Higgs sector, new physics effects are under intensive investigation, with exciting new perspectives of probing Higgs boson couplings even in observables without Higgs bosons. The day finished with a review on the most recent developments on quantum gravity and string theory, even highlighting potential routes to observational tests and validations.

art@CMS

The *ORIGIN Poetics 2019* exhibition at the Zwarre Zaal at KASK features a large collection of works from international artists and art students involved in the art@CMS project. At the same time, *Harbinger*, the local Ghent art@CMS project, is exhibiting at the Botanical Garden near the ICC.



The two projects were nicely brought together during the art@CMS event last Saturday at 19h30 in the Zwarte Zaal. About 50 people enjoyed the artworks and followed presentations from selected artists of both projects. The evening was concluded with many discussions about past and future art-and-science projects over a glass of wine.



On Sunday evening the screening of *The Most Unknown* drew a well-balanced audience of physicists and non-physicists to the Sphinx cinema theatre. The documentary addressed the everyday questions of 9 scientists from various fields, which search for answers on the borders of "the great unknown".

Two of the involved scientists, particle physicist Davide D'Angelo and cognitive psychologist Axel Cleeremans, were present to introduce the movie and answer the big stream of questions after the screening. Apart from an interesting view on enthusiastic scientists' life, *The Most Unknown* also brought us lively discussions on artificial consciousness and the mysteries of dark matter.



Did you know?

On the day of the conference dinner, food talk is in the air. We already recommended some typical Flemish dishes in a previous Waffle, but we didn't discuss **desserts** yet. So here we go! You already got a taste of traditional sweets in your goody bag: cuberdons and chocolates.

Cuberdon is a typical Ghentian candy, also known in Dutch as *Gentse neus* (trad. Ghent nose), because of its conic shape that resembles a human nose. It is gummy and filled with a soft fruity cream.

Belgian **chocolate** is certainly one of the most famous and widespread Belgian products in the world. Just to get an idea, about 2 tonnes of chocolate are sold daily at Brussels airport. Impossible to enclose so much history and tradition in these few lines!

We cannot close this excursus on Belgian sweets without talking about our signature dessert: the **waffle**! Everyone knows the Belgian waffle. But you may not know that the rectangular treat known worldwide as Belgian waffle is only one of the types you can find in Belgium, more precisely the **Brussels waffle**. Equally common is the **Liège waffle**, and just as delicious. Liège waffles are thicker in texture and contain sugar grains and a caramelized sugar coating, with characteristic rounded corners. The waffles consumed in Belgium are typically lighter and fluffier than the versions sold in other countries. As you can see, there is no such thing as a Standard Waffle!

Picture of the day



Today started with the prize ceremony. The 2019 EPS-HEP prize was awarded to CDF and D0 for the discovery of the top quark, while the Giuseppe and Vanna Cocconi Prize for Particle Astrophysics and Cosmology was conferred upon the WMAP and Planck Collaborations for high-precision CMB measurements. Next, a few young outstanding colleagues were rewarded: the 2019 Young Experimental Physicist Prize went to Josh Bendavid and Lesya Shchutska, while the 2019 Gribov Medal was awarded to Douglas Stanford. The EPS-HEP Outreach Prize, finally, was awarded to Rob Appleby, Chris Edmonds and Robyn Watson for the Tactile Collider Project.