



Today, the EPS HEP conference switches to the **plenary sessions**. In the evening, our social programme continues with the **poster session**. In this newsletter we also review some highlights of the weekend.

Today's programme

The EPS Prize ceremony will open the [first day of plenary sessions](#). The morning will continue with the status and plans of the LHC, highlights from the ATLAS and CMS experiments, and a review of the latest Higgs measurements.

The afternoon session will host experimental and phenomenological reviews of standard model and Higgs physics, BSM physics (supersymmetry, string theory, and more), as well as a report on computational methods.

After the plenary session, the poster session is not to be missed, where over wine and cheese many results can be discussed in-depth with the enthusiastic experts.

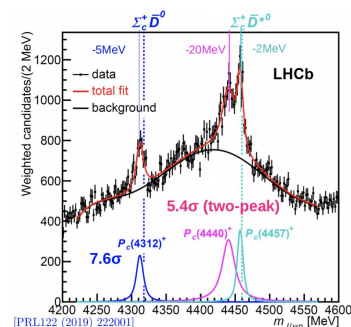
Highlights of Saturday

Stimulating discussions continued in the second session on **accelerators for HEP**, focused on future lepton facilities. FCC-ee was presented in detail on beam-beam and overall parameters, emittance tuning and klystron efficiency. The recent renewed interest in muon colliders was discussed with their potential. A highlight was the talk on commissioning of SuperKEKB, its success being a fundamental step for future e^+e^- circular colliders projects.

The **astroparticle physics and GW** session was devoted to probes of the extreme Universe. Highlights were the O3 run and stochastic gravitational waves backgrounds, and the status and outlook for UHECR after 20y of the Pierre Auger observatory. The session was animated by interesting discussions on theory aspects of GW and UHECR physics, R&D for future cosmic-ray detectors, and exciting prospects for multi messenger astronomy.

The third day on **flavour and CP violation** was devoted to theorists. The focus was on the challenges and attempts to predict flavour observables in the SM and beyond. Such calculations are a vital component of the impressive physics programme in this field driven by the experimental progress. In addition, the theoretical perspective on the current status of B-flavour anomalies was also presented.

Turning to **QCD and hadronic physics**, LHCb and Belle presented observations of exotic states that are pentaquark / baryon-meson molecule candidates. Lots of new results were presented by ALICE, Belle, CLAS, CMS, LHCb, HERMES, H1 and ZEUS, on heavy-flavour production and saturation effects that are not sufficiently reproduced by existing models.



In the **top and EWK physics** session, ATLAS reported the first observation of EWK production of $ZZjj$, as well as differential $Z\gamma$ cross section measurements. CMS updated using VBS measurements previous limits on QGCs. A theoretical result on anomalous QGC significantly reduced the allowed parameter space. Other highlights are EWK couplings in EW EFT, and indirect limits indicating possible scales of new resonant states. The precision prospects in future e^+e^- colliders for Z couplings and asymmetries, W mass, and other quantities, are also noteworthy.

The focus of the last **neutrino physics** session was searches for sterile neutrinos. Short baseline reactor experiments DANSS and STEREO disfavour a large interesting parameter space for sterile neutrinos.



The SoLid experiment on the other hand, presented the first commissioning data with promising prospects. Subsequently, neutrino interactions were put on the table: NOMAD, T2K and MicroBoone presented neutrino cross-section results. New experiments associated to SHiP as well as lepton-flavour models were discussed.

The **heavy ion physics** presentations covered photon interactions, EM probes of the QGP, searches for the critical point, and correlations in small and large systems. Also a significant ridge signal has been reported for the first time in photon-nucleus interactions by ATLAS. The latest LHC Run2 measurements of anisotropic flow from ALICE and results of correlations between mean p_T and flow coefficients from ATLAS push the study of the properties of the QGP to an unprecedented level.

The afternoon featured a special open **ECFA-EPS session**. The Granada open symposium was reviewed along with the status towards the update of the European particle physics strategy. Technological options and challenges were discussed for future accelerators, detectors and computing infrastructure, in particular highlighting the position of our field in relation to the state-of-the-art technology in industry, and the field's need for a focus on education and recognition of current and next generations of physicists working in these technology branches. Furthermore, connections were discussed on experimental opportunities beyond colliders and synergies between astroparticle, particle and nuclear physics. Central to the strategy update is the physics, where the necessity to study in depth the Higgs boson was underlined: a percent-level Higgs precision program is very much wanted to also probe BSM physics.

Outreach event "Cool Physics Day"

On Saturday afternoon our **Cool Physics Day**, the EPS-HEP2019 outreach event, was a great success! Hundreds of locals of



all ages walked through the Ledeganck exhibitions to learn more about particles, the LHC, gravitational waves, famous Belgian scientists, and much more.

Fascinating virtual tours took us on a journey through the CMS and VIRGO experiments. Then physics became entertainment at the spectacular physics show.



Beds of nails, bananas turned hammers, imploding barrels, just to mention a few of the fun experiments that amazed kids and adults.

One of the biggest hits among the children (and some brave adults) was the non-Newtonian fluid experience: basically a chance to walk on (starchy) water! Impressive was also the virtual boat tour along Ghent's canals, which showed us in a simple way what it feels like to approach the speed of light.



For some more pictures, videos, and people's reactions, check out [#CoolPhysicsDay](#) on Twitter.

Did you know?

In previous Waffles we have talked about painting and architecture. But Ghent is also famous for a more alternative form of art. Walking around the town, you have certainly stumbled



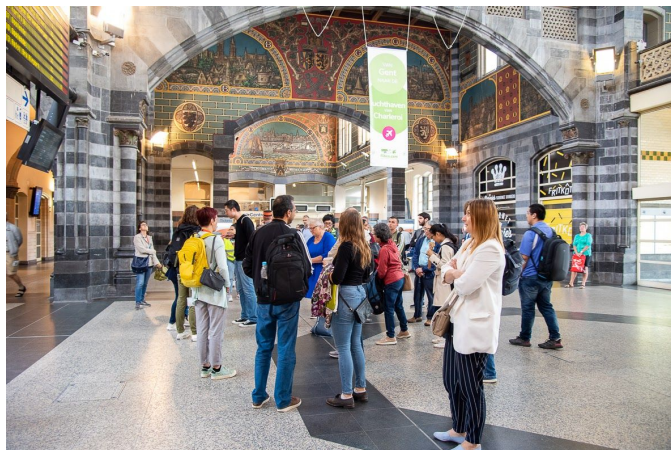
upon dozens of **graffiti** on the walls. From simple tags to real artworks, **street art** is a trademark of Ghent. The City is in fact very supportive of it, allowing for graffiti-tolerant zones and promoting events and projects. Check out the [SORRY. NOT SORRY](#) festival map to get an idea of how widespread it is, from the city center to the outskirts, from amateur pieces to the works of local and international artists. You will find lots of street-art guided tours on foot or by bike.

The best-known site in downtown Ghent is certainly the ever-changing [Werregarenstraatje](#), aka *graffiti street*, a colourful alley turned canvas for young artists. But strolling through the center, at every corner you will find stunning works of art *en plein air*. Impossible to show you all of them here, so now it's up to you to discover your favorite!



Picture of the day

Three excursions took conference participants to Brussels, Bruges or Antwerp on Sunday. Here we get a view on the start of the day at the Ghent Sint-Pieters station.



And this is a stunning side view taken at the excursion's stop over on the Brussels *Grand Place*, only one of the many splendid sights.

