

In the news

GOOD OMENS



Credit: Iulia Georgescu/Springer Nature Limited

In July, more than 750 physicists met in Ghent, Belgium for the biannual European Physical Society High-Energy Physics (EPS-HEP) conference. One of the most important meetings in particle physics, EPS-HEP spans a broad range of topics: theory and experiment in particle physics, detectors and data analysis, astroparticle physics and gravitational waves, dark matter and cosmology. The first part of the meeting is dedicated to multiple parallel technical sessions, whereas the second part follows with 3 days of plenary talks. “Because of the [European Particle Physics Strategy](#) discussions taking place at the moment we are focusing on the future, but I am more positive about the present after this meeting: there is a lot going on right now,” said Jonathan Butterworth, who gave the summary talk of the meeting.

Indeed, there was a lot to take in at EPS-HEP this year. The ATLAS and CMS Collaborations presented new results from the analysis of the full dataset from the Large Hadron Collider (LHC) second run between 2015 and 2018, including the latest precision measurements of the Higgs boson. Other developments include the charge parity violation in the decay of D^0 mesons, reported earlier this year, and the persisting flavour anomalies: deviations from the lepton-flavour universality, which assumes that the interactions between leptons and gauge bosons are flavour independent. These flavour anomalies may be signs of new physics and could be confirmed as more data becomes available. This is just one of the reasons for excitement regarding the new run of the Belle II experiment, which started this spring.

Other trends include the progress in the study of high density quantum chromodynamics in heavy-ion collisions, which makes use of the analysis of jets, well developed at the LHC experiments. In addition to developments in astroparticle physics, in particular those related to multi-messenger observations, there are also recent advances in theoretical and computational methods. An overarching trend was the use of data analysis tools to squeeze more information from the experimental or observational data. “We can get more from the data than we ever expected,” noted Butterworth.

All these advances, the convergence of ideas in particle and heavy-ion collisions and of disciplines in multi-messenger astronomy and the ongoing discussion about future facilities bode well for the next EPS-HEP in 2021.

Iulia Georgescu