



## RESEARCH

### **ATLAS HAS OBSERVED A RARE PHENOMENON WITH PROMISING DEVELOPMENTS FOR THE FUTURE OF LHC**

At the beginning of August, at the international high-energy physics conference ICHEP 2020 - held in virtual form from Prague - CERN's ATLAS scientific collaboration presented new results that pave the way for a new way of using the LHC accelerator as a high-energy photon collider. The experiment announced the first observation of photon-induced production of a pair of W bosons, weak force mediating particles. This is the observation of a very rare phenomenon in which the two photons interact with each other to produce two W bosons of opposite electrical charge, through the direct interaction of four mediators of two different forces, the electromagnetic force and the weak force. The result has a very high significance of 8.4 sigma, which rules out the possibility that it is due to a statistical fluctuation. While what ATLAS observed confirms one of the main predictions of the electroweak theory, it also provides a new way, through the study of photon collisions, of testing the Standard Model and probing the New Physics, to reach a deeper understanding of our universe. The observation of photon-induced production of W boson pairs is a further fundamental step forward in our understanding of electro-weak interactions, following the measurement in 2017 of the light-by-light interaction process in which photon pairs are generated in photon interactions. ■