PRESS RELEASE
May 16th, 2025

New detector in CERN: the key role of Belgian scientists

An interuniversity team of 40 Belgian scientists has begun production of these parts, which will be incorporated into the new version of CMS, one of CERN's two major particle detectors. Its mission is a major one: to build 1,600 high-precision modules in 2 years!

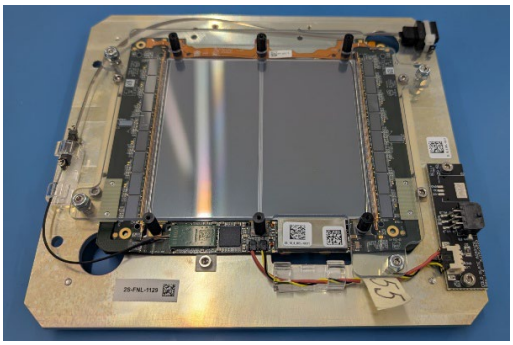
In a clean room at the Interuniversity Institute for High Energies (IIHE-ULB/VUB) in Brussels, the first modules have already seen the light of day. They are the fruit of collaboration between researchers, physicists and engineers from ULB, VUB, UCLouvain, UGent and UAntwerpen. These Belgian universities have been asked to design and build one of the components of the new trajectograph that will be integrated into the new-generation CMS and will be capable of detecting the trajectories of thousands of particles produced by collision, 40 million times per second.

The CMS (Compact Muon Solenoid) is one of the two large particle detectors built at CERN's Large Hadron Collider (LHC) on the French-Swiss border near Geneva. However, the current LHC has reached its maximum capacity and will be shut down for four years in the summer of 2026. During this break, CERN's accelerator complex will be upgraded to produce up to 10 times more collisions than currently, in a new run of collisions scheduled to last from 2030 to 2041. This new detector, with its exceptional characteristics, should lead to decisive advances in our understanding of matter.

This is the background of the Belgian scientists' mission, in addition to significant support from the Fonds de la Recherche Scientifique (FNRS) and the Fonds Wetenschappelijk Onderzoek - Vlaanderen (FWO), which have together allocated more than €12 million to the upgrade of the CMS experiment.

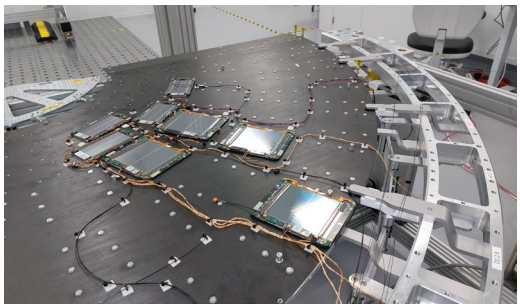
Belgium has always made a major financial and scientific contribution to CERN, and to CMS in particular. Around a hundred Belgian scientists are currently working on this experiment, which brings together 4,000 researchers from all over the world. CMS is one of the two experiments that led to the discovery of the Brout-Englert-Higgs boson in 2012, which confirmed a theory developed almost 50 years earlier and for which our compatriot François Englert in particular was awarded the Nobel Prize in 2013. Since the discovery of this boson, the LHC has continued to produce collisions that have improved our understanding not only of this remarkable particle, but also of particle physics in general and of new phenomena beyond the Standard Model. This was particularly the case last March with the uncovering of an excess in the production of pairs of top quarks, forming a kind of astonishing molecule in which each quark risks disintegrating even before bonding with the other quark.

Physicists and engineers from five Belgian universities have joined forces in the cleanroom at the Interuniversity Institute for High Energies (IIHE-ULB/VUB) in Brussels.
The facilities began to be developed at the IIHE in Brussels in 2016. With the construction of the first modules - a new one every day - made up of mechanical and electronic parts, and tested to be fully functional, Belgian physicists have reached an important milestone that launches the assembly campaign for the next two years.



© CERN, for the benefit of the CMS Collaboration

One of the first modules built at the Interuniversity Institute for High Energies (IIHE-ULB/VUB) in Brussels
The modules are assembled and fully tested at the IIHE-ULB/VUB in Brussels before being integrated and commissioned on their support structures at UCLouvain. The double discs assembled at Louvain-la-Neuve will then be shipped to CERN. Once installed in the CMS, no repair is possible, which is why the tests carried out in Belgium must ensure reliable operation for more than 10 years.



© CERN, for the benefit of the CMS Collaboration

Exercise involving the integration of modules on their support structure at the CP3 centre at UCLouvain

CMS collaboration management team welcomed to IIHE-ULB/VUB by members of the CMS Belgium team
On the occasion of the start of construction of the upgraded detector, the CMS spokesperson, Gautier Hamel de Monchenault (CEA Paris-Saclay), the CMS upgrades coordinator, Frank Hartmann (Karlsruhe Institute of Technology), and the president of the CMS institutes assembly, Elisabetta Gallo (Deutsches Elektronen-Synchrotron Hamburg), visited the Belgian teams, in particular the students and young researchers, to discuss the present and future operation of the CMS experiment.

Press contact FNRS
Stéphanie Tuetey
Responsable communication
FNRS – Fonds de la Recherche Scientifique
Rue d'Egmont 5, 1000 Bruxelles
+32 474 35 57 19
stephanie.tuetey@frs-fnrs.be
www.fnrs.be

Press contact FWO
Kim Barbé
Adviseur communicatie
Fonds Wetenschappelijk Onderzoek – Vlaanderen (FWO)
HOEK38 - Leuvenseweg 38, 1000 Brussel
02 550 15 48
communicatie@fwo.be
www.fwo.be