

# 2016 IN PICTURES

*From the achievements of the Large Hadron Collider to the growth of the CERN family, hundreds of new physics results and visits from numerous VIPs, here we take a look back at the year's highlights in pictures.*



## 20 JANUARY

The President of Lithuania, Dalia Grybauskaitė, visits CERN and learns about the experiments being carried out in S'Cool LAB, a laboratory for high-school students.

## 15 FEBRUARY

Fabiola Gianotti, CERN Director-General, opens "Physics for Health in Europe", a major medical conference co-organised by CERN. This interdisciplinary conference brings together physicists, engineers, doctors and IT specialists to look for innovative solutions in the fields of medical imaging and cancer treatment.



## 23 JANUARY

Muhammad Nawaz Sharif (centre), Prime Minister of Pakistan, admires the CMS experiment, guided by Tiziano Camporesi (right), the experiment's spokesperson. Pakistan became an Associate Member State of CERN in 2015.



## 24 MARCH

Johann Schneider-Ammann, President of the Swiss Confederation, signs CERN's guestbook in the presence of the Director-General.

## 25 MARCH

Particles begin circulating again in the LHC, marking the start of its 2016 run. After a few weeks, the intensity of the beams is increased and the experiments start to take data (see p. 21).



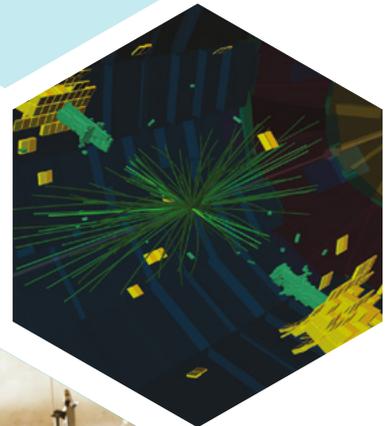
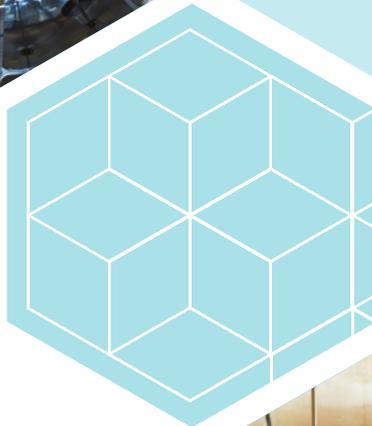
## 25 MAY

The CLOUD experiment publishes new results on the formation and growth of aerosol particles in the atmosphere, which go on to form clouds. The results suggest that the climate was cloudier in the pre-industrial age than previously thought (see p. 17).



## 26 JUNE

The LHC exceeds its nominal luminosity for the first time. Luminosity is a measure of a collider's efficiency and is proportional to the number of collisions delivered to the experiments (see p. 21).



## 4 APRIL

The Republic of Cyprus becomes a CERN Associate Member State in the pre-stage to Membership, following the ratification by its parliament of the agreement signed four years earlier. George Pamboridis, Cyprus's Minister of Health, visits CERN in May. He is pictured here with Charlotte Warakaulle, Director for International Relations, and Frédéric Bordry, Director for Accelerators and Technology.



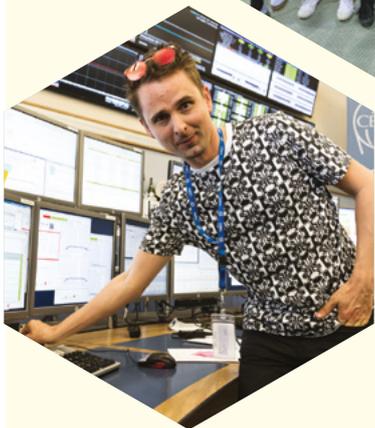
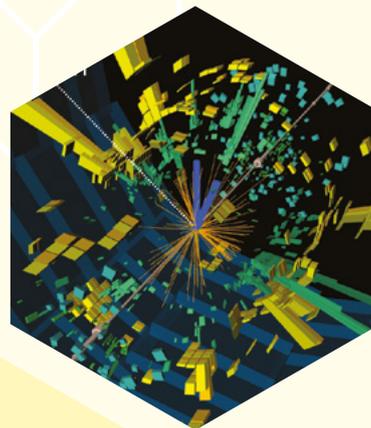
## 17 JUNE

The AWAKE experiment receives its first beam of particles. The project is designed to study a new acceleration technique for the accelerators of the future (see p. 49).



## 28 JUNE

At the LHCb experiment, three new exotic particles are observed and the existence of another is confirmed. Each are formed from two quarks and two anti-quarks (see p. 16).



## 19 AND 21 JULY, 13 SEPTEMBER

When physics meets music... The rock group Muse, led by singer Matt Bellamy (left), gets a behind-the-scenes look at the CERN Control Centre. Two days later, the four members of the British band Bastille discover CERN's antimatter experiments (top left). In September, CERN receives a visit from the Canadian group Nickelback (centre).

## 5 AUGUST

Physics in the Windy City! Particle physicists meet up in Chicago in the United States for their flagship biennial meeting, the International Conference on High Energy Physics (ICHEP). Thanks to the exceptional performance of the Large Hadron Collider (LHC), the experiments have gathered huge amounts of data and are able to present around a hundred new results.

## 10 AUGUST

The MoEDAL collaboration celebrates the publication of its first physics results. The experiment is searching for a hypothetical particle, the magnetic monopole (see p. 15).



## 16 SEPTEMBER

Students from the two winning teams of the 2016 Beamline for Schools competition, from Poland and the United Kingdom, come to CERN for a week to carry out their experiments using a CERN accelerator.



## 5 SEPTEMBER

The CERN family continues to grow! The Laboratory welcomes Romania as its 22nd Member State. The blue, yellow and red flag joins those of the other 21 Member States in a ceremony attended by the President of the CERN Council, Sijbrand de Jong, CERN Director-General, Fabiola Gianotti, the President of Romania, Klaus Iohannis, and the Romanian Minister for Education and Scientific Research, Mircea Dumitru.

## 30 SEPTEMBER

Around 600 people flock to the Globe of Science and Innovation and the ATLAS experiment's Visitor Centre for European Researchers' Night.

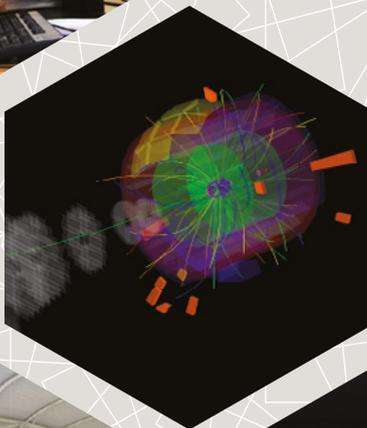


## 5 OCTOBER

Ukraine becomes an Associate Member State of CERN following ratification by its parliament of the agreement signed in October 2013.

## 10 OCTOBER

UNOSAT, the operational satellite applications programme of the United Nations Institute for Training and Research, celebrates its 15th birthday. UNOSAT uses the infrastructure of CERN's Data Centre for humanitarian purposes, producing extremely precise maps of regions of the world affected by natural disaster or conflict.

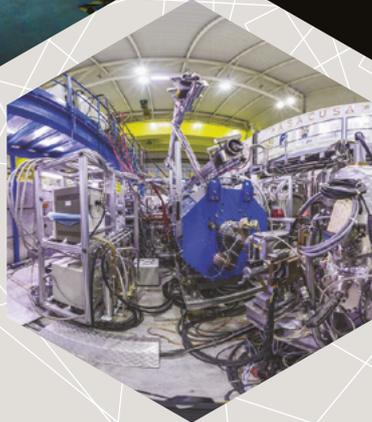


## 10 NOVEMBER

Lead nuclei begin circulating in the Large Hadron Collider (LHC). From now until the year-end technical stop, the LHC will produce collisions only between protons and lead ions. The image shows one of the first such collisions recorded by the ALICE experiment.

## 25 OCTOBER

Linac4 accelerates its first beam at its design energy of 160 MeV. The accelerator will be connected to CERN's accelerator chain in 2019 (see p. 46).



## 3 NOVEMBER

The ASACUSA antimatter experiment announces a new precise measurement of the mass of the antiproton compared to the mass of the electron (see p. 17).

## 5 NOVEMBER

The 2016 TEDxCERN event, entitled "Ripples of Curiosity", brings together 12 pioneers from various scientific fields, whose ideas have caused waves of change (see p. 38).

## 21 NOVEMBER

Fabiola Gianotti, CERN Director-General, and Sekhar Basu, President of India's Atomic Energy Commission and Secretary of India's Department of Atomic Energy (DAE), sign an agreement with a view to the admission of India as an Associate Member State of CERN.



## 19 DECEMBER

The ALPHA antimatter experiment observes the light spectrum of antimatter for the first time (see p. 17).



## 30 NOVEMBER

SESAME, Synchrotron-Light for Experimental Science and Applications in the Middle East, comes full circle with the installation of its accelerator. Located in Jordan, the centre is a collaboration between several Middle Eastern countries and is the region's first synchrotron laboratory. In July, it launched its first call for proposals for experiments, which are due to begin in 2017. CERN contributed to the construction of SESAME by developing magnets in the framework of the CESSAMag project, which was co-funded by the European Commission.

## 16 DECEMBER

The Minister of Education, Science and Sport of Slovenia, Maja Makovec Brenčič (left), and CERN Director-General, Fabiola Gianotti, sign an agreement under which the Republic of Slovenia will become an Associate Member State in the pre-stage to Membership.

## 19 DECEMBER

Arturo Cabrera (left), deputy permanent representative of Ecuador to the United Nations Office and other international organisations in Geneva, and Eckhard Elsen, CERN Director for Research and Computing, mark the donation of IT equipment to an Ecuadorian educational establishment. Thanks to this equipment, the National Polytechnic School will be able to set up a data centre that will form part of the Worldwide LHC Computing Grid (WLCG). CERN has now made ten donations of IT equipment to various educational establishments around the world.