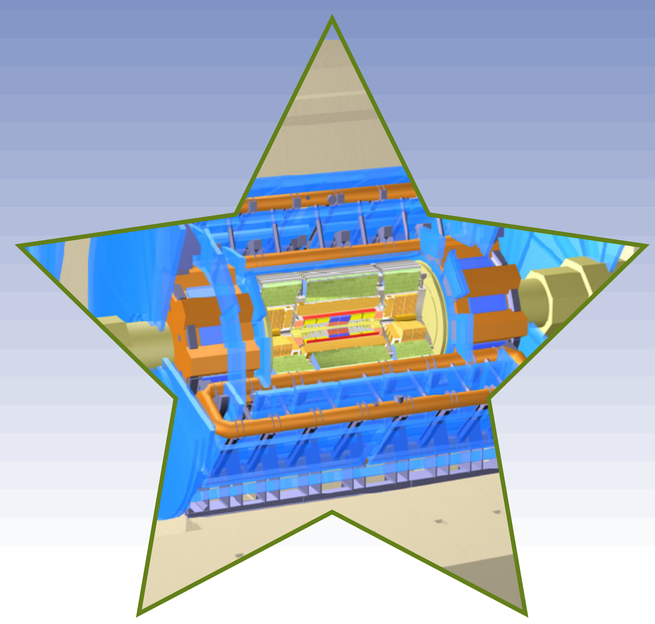
CERN – a laboratory for the world

CERN was founded in **1954** as one of Europe's first joint ventures, bringing specialists from 12 Member States together to pursue a common dream. Established on the Franco-Swiss border near **Geneva**, it has gone on to be a shining example of successful international collaboration. Today, CERN has **20 Member States**, and nations from around the globe participate in its research programme.

CERN, the European Organization for Nuclear Research, is one of the world's most respected centres for scientific research. Its business is fundamental physics, finding out what the Universe is made of and how it works. At CERN, the world's largest and most complex scientific instruments are used to study the basic constituents of matter, the fundamental particles. By studying what happens when these particles collide, physicists unravel the laws of Nature.



The instruments used at CERN are **particle accelerators and detectors**. Accelerators boost particles to high energies and collide them with stationary targets or each other. Detectors observe and record the results of these collisions. The oldest still-functioning accelerator at CERN is the **Proton Synchrotron** (PS), which came into operation in 1959. The **Super Proton Synchrotron** (SPS), fed by the PS, was commissioned in 1976. In the early 1980s, the SPS provided the beams for the research that brought the **Nobel Prize** to CERN for the first time in 1984. The **Large Electron Positron collider** (LEP), built in a 27 kilometre circular tunnel deep underground, was CERN's flagship research facility from 1989 to 2000.

Successive accelerators bring higher energies, extending the range of phenomena that can be studied. Its mission complete, LEP has now been dismantled to make way for a more powerful machine, the **Large Hadron Collider** (LHC), which will be installed in the same tunnel.

While **CERN builds the accelerators**, **scientists from universities and research institutes build the detectors.** As physics has advanced, detectors have become bigger and more complex. The largest of those in preparation for the LHC stand as high as a six-floor office block. They weigh up to **12500 tonnes**, and are being built by teams of almost **2000 people**. Altogether, CERN's research programme involves some **6500 researchers** from **500 institutes in 80 countries.**

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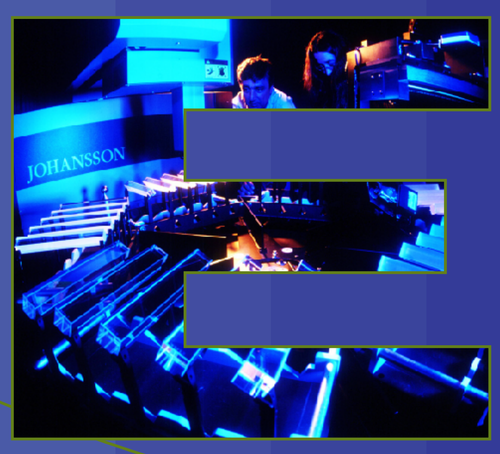

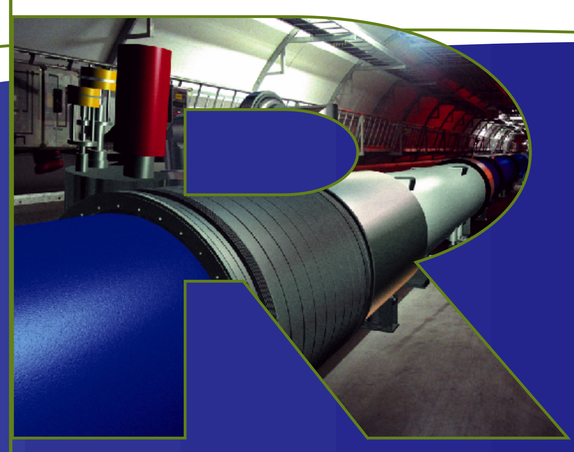

Such research pushes technology to its limits bringing important benefits to society. The **World Wide Web was invented at CERN** in response to the research community's growing communications needs. Medical imaging, computer chip manufacture and contraband detection are also among fields to have benefited from technological advances first made in the name of fundamental particle physics research. With the LHC, the CERN community is pushing technology harder than ever before. The data handling requirements of the LHC experiments, for example, require computing and networking technology capable of sorting through a mammoth 800 million individual particle collisions per second. A new distributed approach to computing, called the **Grid**, is being developed to handle the analysis of this data. New benefits for society are sure to follow.