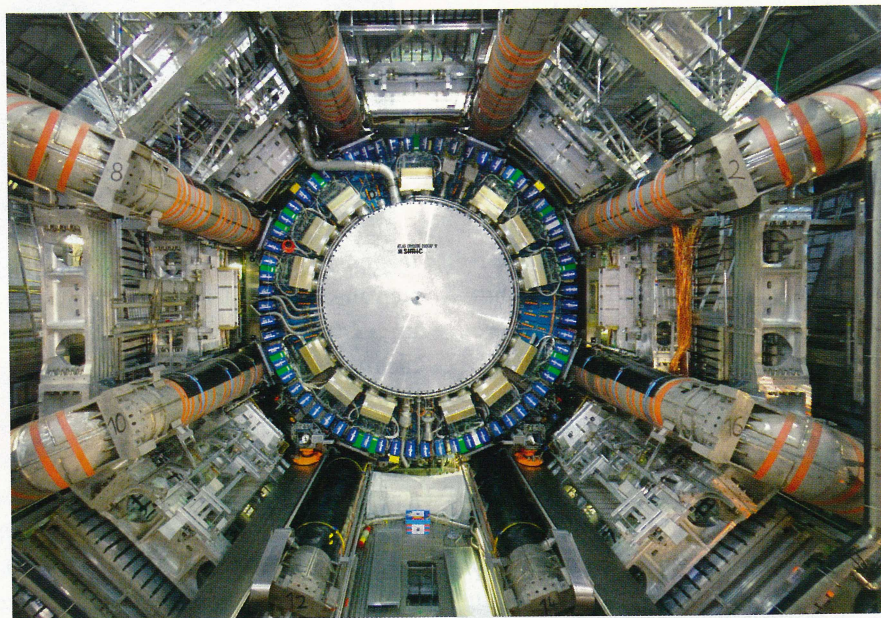


Unveiling the secrets of the universe

CERN's openlab projects



© Cern

Upon the 20th anniversary of the birth of the World Wide Web, the European Union has declared 2009 the European Year of Creativity and Innovation. CERN, and specifically its openlab sector, has already begun to fulfil public expectations of this year of discovery.

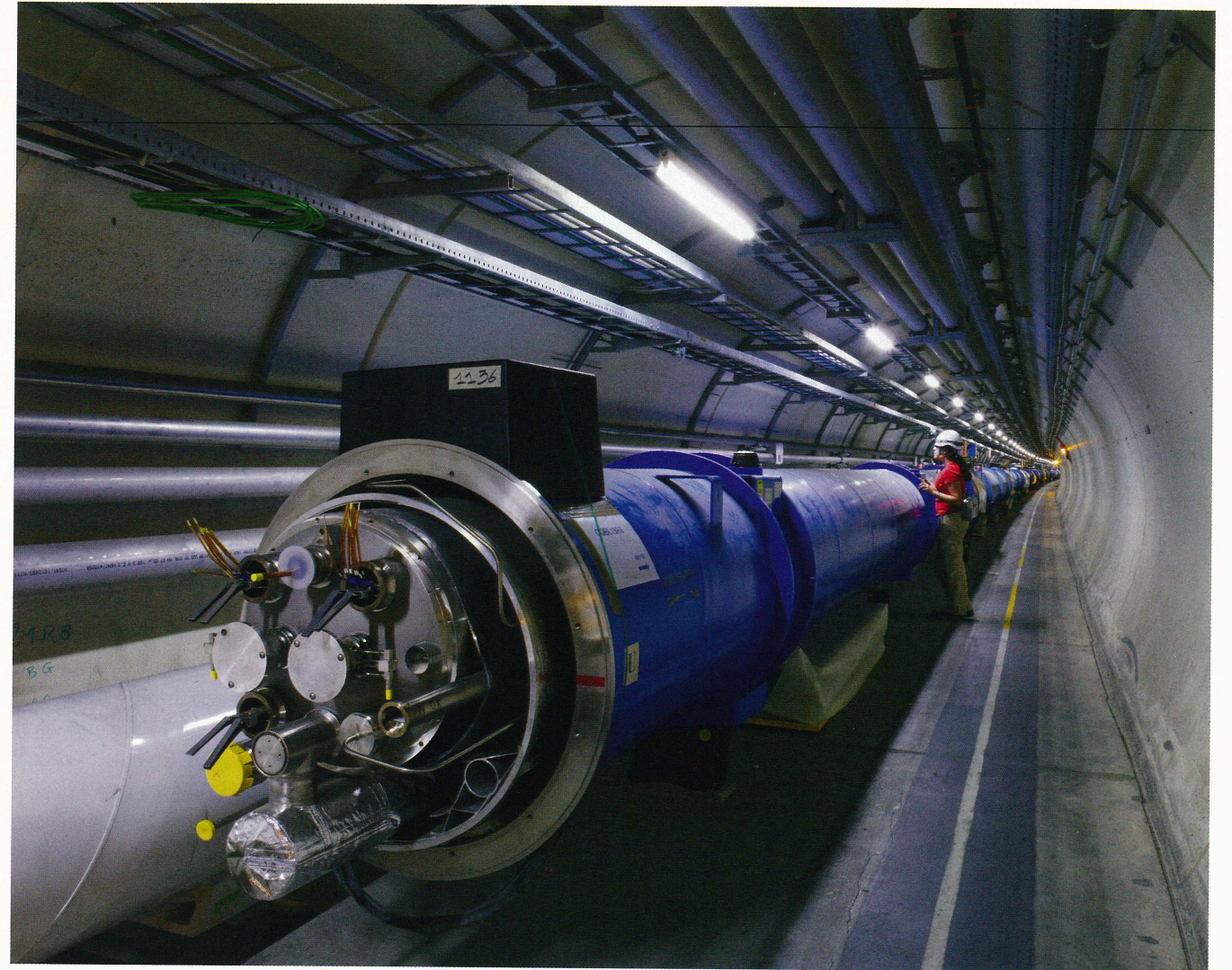
LHC Computing Grid Project – CERN openlab is, simply put, the collaboration between CERN, or the

European Organization for Nuclear Research, and its corporate partners which gives worldwide insight on its main initiative, the Large Hadron Collider (LHC). The LHC is a giant particle accelerator which moves subatomic particles – or “hadrons” – nearly at the speed of light until the point of collision. At this moment, conditions within the accelerator are similar to that just after the Big Bang. Particle detectors will then produce over 15 million gigabytes of data each

year, which then must be stored and analysed by computing centres across the globe.

Known as the LHC Computing Grid Project, this international scientific grid service is CERN openlab's main initiative, and will allow computing industries access to data through a complex infrastructure that may change the future of science and, more importantly, the universe.

The tier system – The data will be looked at using a four-tier system. CERN Computing Centre, being Tier-0, will be the initial processor of the data. According to the annual report, “an estimated 5,000 servers will be available in the CERN Computer Centre and another 6,000 at the detector sites of the four different LHC experiments.” Once this data is transmitted to the first tier, which consists of 11 sites in countries such as the United States, Canada, Germany, Spain, France and Italy, it will be stored in great capacities. Tier-two includes 140 sites across the globe that take on more specific analytic tasks than those in tier-one; and lastly, tier-three allows individual scientists to see the processed data on a regular basis.



© Cern

Entering its third phase – Now having entered its third phase, CERN openlab aims to expand the work done in the second phase, partnering and working with more services and technologies that will further their research. The Head of CERN openlab, Wolfgang von Rüden, claims that this phase “will not only capitalize on and extend the successful work carried out in openlab-II, but will also tackle new crucial areas.” Ultimately, and with the help of computing industries, CERN openlab plans to delve deeper into the nature and purpose of matter, particularly in relation to anti-matter, on Earth.

Other projects – Even though the LHC Grid Project is a large component of its research, CERN openlab has also launched other projects with partners HP, Intel, Oracle and Siemens. These projects are organized in four technical domains and are either directly or

indirectly related to the Grid Project and CERN as Tier-0: the Automation and Controls Competence Centre (ACCC), the Database Competence Centre (DCC), the Networking Competence Centre (NCC) and the Platform Competence Centre (PCC).

“Era of LHC data exploitation” – Through these partnerships, CERN openlab has created a “synergy with leading IT companies”, according to the annual report. Labelled an “era of LHC data exploitation”, each day CERN openlab comes closer to unveiling the answers to questions that continue to stump scientists and researchers. Having celebrated the 20th anniversary of Tim Berners-Lee's celebrated document “Information Management: a Proposal in March,” this year serves as a timely reminder of the research and development for which CERN is notoriously known.

The broader picture – CERN, recognized as the world's largest particle physics research laboratory, was founded in 1954 and deals mostly with fundamental physics. Located just northwest of Geneva, the site resides along the Jura Mountains, bordering France and Switzerland. Researchers from across the globe travel to CERN for its outstanding resources and reputation – about 6,500 visiting researchers and 2,500 resident staff. There are six particle accelerators on site, the LHC being the largest scientific instrument in the world. The research laboratory is funded by 20 member states, of which France, Germany, Spain, Italy and the United Kingdom are a part. With a great bulk of the world's scientific research having been done there, CERN has been the recipient of several awards, including the Nobel Prize in physics.