

Viewpoint

Latin America comes to CERN

Luciano Maiani on forging new links between Europe and the New World.



International collaboration in physics was born in Europe, after the Second World War, to explore subnuclear particle physics. An entirely new world, unveiled by the interactions of cosmic rays in the Earth's atmosphere, could be studied only with particle accelerators so big that no country in Europe could afford to build them. The vision of distinguished European scientists and statespersons led to CERN's creation in 1954.

In the 1980s a mutation took place as CERN entered the era of the Large Electron Positron (LEP) collider. The experiments needed large human and financial resources, which CERN could not provide. Universities and their associated countries formed large-scale collaborations, with extensive funds for the construction and operation of detectors and to support the travel of professors and students to collect and translate into new physics the data produced at LEP. This phenomenon has since repeated itself, on a larger scale, with the LHC. Today CERN has more than 10,000 "users" from around the world.

At the end of 2003, Juan Antonio Rubio, Verónica Riquer and I realized that a major obstacle for Latin American scientists to take part in experiments at the LHC was the lack of regular funds for their, and their students', mobility. The outcome was the High-Energy physics Latin-American European Network – HELEN – financed by ALFA, a programme created by the European Union (EU) to facilitate the scientific interchange between Europe and Latin America (*CERN Courier* October 2005 p26).

High-energy physics already had a considerable tradition in Latin America. In the early 1930s, Manuel Sandoval Vallarta in Mexico discovered the "east-west effect", which showed that cosmic rays are charged particles. (Bruno Rossi obtained a similar result with an expedition in Africa.) Cesar Lattes and Beppo Occhialini created a vital school in experimental particle physics in



Luciano Maiani. (Image credit: CNR.)

Brazil, which produced important physicists such as Roberto Salmeron, Alberto Santoro and many others. On the theory side, Marcos Moshinski made significant contributions to group theory in nuclear physics, and the beginning of the Standard Model witnessed important results by José Leite Lopez, Juan José Gianbiagi, Carlos Guido Bollini, Miguel Virasoro and many others. Richard Feynman's lectures in Rio had a profound influence, and the efforts of Leon Lederman definitely oriented the experimental school in South America towards Fermilab.

The aim with HELEN was to change the tendency to work with the US, which had been only marginally affected by the participation of Brazilian groups in LEP. Among the objectives for mobility, we listed training of the younger generations, through participation in advanced experiments, and access to technological benefits in accelerator, detector and information technology. The result was a network of 22 universities from eight Latin American countries, 16 universities from six European countries, CERN and the Pierre Auger Observatory in Argentina.

Starting in July 2005 and ending in April 2009, HELEN enabled mobility totalling 1596 man months, mainly from Latin America to Europe, but also from Europe to Latin America, and within Latin America – where the grants helped to foster collaboration. The total cost was €3.0 million, with €2.7 million coming through EU support.

The exciting adventure of creating a Latin-American community in the scientific heart of Europe started in January 2006,

with the arrival at CERN of the first HELEN grant-holders from Latin America. Several events were organized by HELEN in Argentina and in Mexico to transfer CERN technologies in accelerator physics and computing. For example, members of the CMS collaboration travelled to Brazil to help set up an LHC Computing Grid Tier-2 centre for CMS at the Rio de Janeiro State University and in Sao Paulo.

Prompted by the success of HELEN, in 2009 we proposed a new project that started in February 2011 – the European Particle physics Latin-American Network (EPLANET), funded by the EU in the Marie Curie Actions of the 7th Framework Programme. Supported by EPLANET, professors and graduate students can participate in the exciting research that began at the LHC in 2010, when the first physics run started.

The objective of EPLANET is to train scientific personnel in the collaborating institutions through participation in world-class experiments performed at CERN and the Pierre Auger Observatory. The rules of the Framework Programme allowed the admission of only four countries from Latin America – namely Argentina, Brazil, Chile and Mexico. CERN has provided additional funds to continue the collaboration with Colombia, Peru and Venezuela that started with HELEN.

All in all, HELEN and EPLANET are perceived in the high-energy physics community as unprecedented and successful efforts to integrate the particle-physics communities of Europe and Latin America. HELEN made possible the full participation of Latin American groups in the LHC experiments and as a consequence, Latin American physicists contributed to the discovery of a Higgs boson by the ATLAS and CMS experiments. Now, EPLANET continues to promote sustainable collaboration between Europe and Latin America in high-energy physics and its associated technologies. I am confident that the two initiatives will have a major impact on multilateral Latin America–EU co-operation.

● Luciano Maiani, *Universita' di Roma "La Sapienza"*, and CERN director-general (1999–2003). From a talk given at *Ciencia, Tecnologia, Innovacion e Industrialización en America del Sur*, Rio de Janeiro, 2–4 December 2013.

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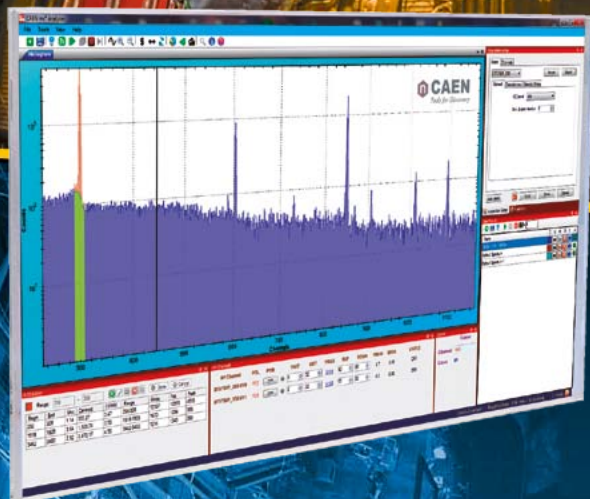
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WELCOME

CERN Courier – digital edition

Welcome to the digital edition of the June 2014 issue of *CERN Courier*.

In February 2013, CERN's accelerator complex began its first long shutdown in the LHC era. After more than a year, the complex is beginning to reawaken, and the consolidation work on the LHC is reaching its finale. The LHC has produced vast amounts of data, some of which is available for schools to study in the International Masterclasses. These take place in many countries, giving students a real feel for the international side of particle physics. Such collaboration began in Europe with CERN's founding 60 years ago. Now, collaboration with CERN extends to regions such as Latin America. At the same time, new international facilities continue to be built for scientific research. The latest, the European Spallation Source, will provide an intense source of neutrons for a variety of studies.

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