

Viewpoint

The strength of worldwide collaboration

Physicists from across the globe bring a welcome richness to the LHC experiments.



The enthusiasm and motivation to explore particle physics at the high-energy frontier knows no borders

between the nations and regions of the planet. It is shared between physicists of widely different cultures and origins. This is evident today when looking around the large but still overcrowded auditoria where the latest results from the LHC are presented, as with the announcements of the Higgs-boson discovery (*CERN Courier* September 2012 p43). Such results are, in turn, presented by speakers on behalf of LHC collaborations that span the globe, with physicists from all inhabited continents.

Today we take this for granted, but it is worth remembering that it took about two decades to grow and consolidate these worldwide scientific and human projects into the peaceful, creative and efficient networks that are now exploring LHC physics. This process of collaboration building is of course not finished yet, and many challenges remain. CERN and its experiment collaborations at the LHC's predecessors – the Large Electron–Positron collider and the Super Proton Synchrotron $\bar{p}p$ collider – have long been a fertile cradle for physicists teaming up from different regions (*CERN Courier* March 2014 p23 and April 2014 p16), but with the LHC collaborations, globalization for the experiments has reached a new scale. Roughly speaking, about half of the participants in ATLAS and CMS are from non-member states of CERN.

I consider it a big privilege to have witnessed this evolution from inside CERN and actively from inside the ATLAS collaboration – and to have been able, humbly, to contribute to it a little. For me, the first contacts with far-away countries started with several visits as a junior member of CERN delegations in the late 1980s and early 1990s, presenting the LHC dream to colleagues and decision makers in places



Peter Jenni in the ATLAS cavern. (Image credit: Claudia Marcelloni.)

such as Russia (still the Soviet Union in the beginning), Eastern Europe and Japan, and later across the world. My “hat” changed quickly from predominantly CERN to ATLAS from the early 1990s, and the focus moved from generic LHC detectors and physics to a concrete experiment project.

A formidable evolution took place during the past 25 years, which was a pleasure to see. Presenting the LHC and ATLAS in the early years could be quite an adventure. There were places where electricity for the slides was not always guaranteed, many colleagues from potential new collaboration partners barely spoke any English, and the local custom could be that only the most senior professor would be expected to speak up. Today one may find, at the same places, the most modern conference installations and – even more enjoyable to see – confident, clever young students and postdocs expressing their curiosity and opinions.

What was also striking in the early times was the great motivation to be part of the experiment collaborations and to contribute – sometimes under difficult conditions – to the building up of the experiments. I often had the impression that colleagues in less privileged countries made extraordinary efforts, with many personal sacrifices, to fulfil their promises for the construction

of the detectors. Those of us from richer countries should not forget that!

Of course an experiment like ATLAS could not have been built without the massive and leading contributions from CERN's member states and other large, highly industrialized countries, and we experimentalists must be grateful for their support in the first place. They are the backbone that made it possible to be open to other countries that have great human talent but little in the way of material resources.

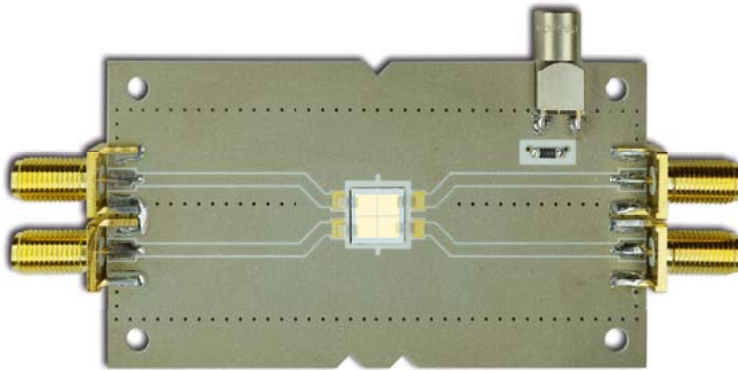
The years immediately following the ATLAS and CMS Letters of Intent in October 1992 were a time when the two collaborations grew most rapidly in terms of people and institutes (*CERN Courier* June 2013 p22). The spokespersons made many trips to far-flung, non-European countries to motivate and invite participation and contributions to the experiments, in parallel (and sometimes even in competition) with CERN's effort to enlist non-member-state contributions to enable the timely construction of the accelerator. It was during this period that the current healthy mix of wealthy and less-wealthy countries was established in the two collaborations, placing value clearly not only on material contributions but also on intellectual ones.

The building up and consolidation of collaboration with continents in the Southern hemisphere is, in general, more recent, and has benefited, for example in the case of Latin America, from European Union exchange programmes, which in particular have brought many bright students to the experiments (*CERN Courier* June 2014 p58). Yet, there is a long way to go in Africa, with many talented people eager to join the great LHC adventure. Of course fundamental physics is our mission, but personally I am also convinced that attracting young people into science will help society in all regions, ultimately. So CERN with the LHC, which from the early dreams now spans half of the organization's 60 years, can also be proud of contributing a seed to building up a peaceful global society. For me personally, besides the physics, the LHC has also brought many friends across the world.

● Peter Jenni, Albert-Ludwigs-University Freiburg and CERN, spokesperson for ATLAS until February 2009.

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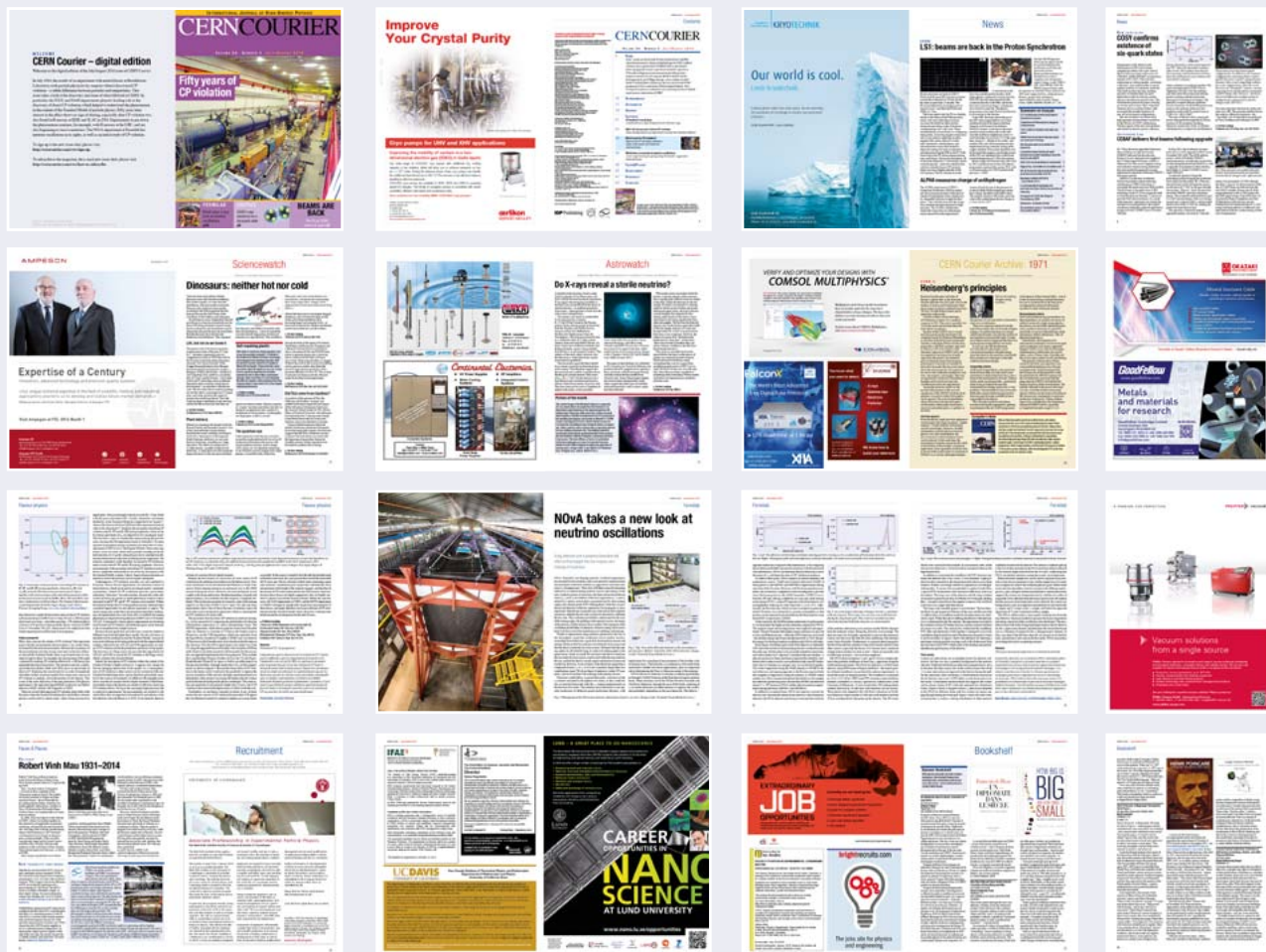
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VOLUME 54 NUMBER 6 JULY/AUGUST 2014

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WELCOME

CERN Courier – digital edition

Welcome to the digital edition of the July/August 2014 issue of *CERN Courier*.

In July 1964, the results of an experiment with neutral kaons at Brookhaven Laboratory took particle physicists by surprise when it discovered CP violation – a subtle difference between particles and antiparticles. This issue takes a look at the discovery and some of what followed at CERN. In particular, the NA31 and NA48 experiments played a leading role in the discovery of direct CP violation, which helped to understand the phenomenon in the context of the Standard Model of particle physics. Fifty years later, interest in the effect shows no sign of abating, especially after CP violation was also found in B mesons at KEK and SLAC in 2001. Experiments to pin down the phenomenon continue, for example, with B mesons at the LHC, and are also beginning to turn to neutrinos. The NOvA experiment at Fermilab has neutrino oscillations in its sights, as well as an initial study of CP violation.

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