

CERN: a forward look

Why CERN's geographical enlargement is important for the future.



On 1 July, the cycle of events celebrating CERN's 60th anniversary opened in Paris with an event commemorating the anniversary of the CERN Convention, which was signed at the UNESCO headquarters in 1953 by representatives of the founding members. These 12 signatures are indeed worth commemorating. For more than half a century, the convention has stood the test of time as a masterpiece of simple and minimalistic legal language that focuses wisely on the essential cornerstones of CERN's institutional basis and governance. At the same time, it provides for the leeway that is necessary to adapt the organization to a changing political environment, and to new scientific and technological challenges. The convention is a testimony to the wisdom and foresight of CERN's founding fathers, on a par with their vision of rebuilding peace in Europe by establishing a unique focal point that would foster scientific collaboration on an unprecedented scale, between nations that had fought a war against each other only a few years earlier. On the basis of this convention, CERN has served as a model for other successful European science organizations, and most recently for the SESAME synchrotron light source in the Middle East (*CERN Courier* September 2014 p46).

Some of the most intriguing aspects of the CERN Convention are in the provisions for membership in the organization. Whereas Article II stipulates that "the Organization shall provide for collaboration among European States in nuclear research of a pure scientific and fundamental character...", nowhere is it stated explicitly that membership in CERN is *restricted* to European states. This ambiguity is by no means fortuitous. It reflects the fact that already in the early 1950s, a possible enlargement of membership beyond Europe was a hotly debated issue on which the provisional council could not reach agreement. It agreed, however, on a carefully

crafted compromise that left a door open to shaping the membership policy of CERN at a later stage, and to adapting it to an evolving scientific and political landscape.

Indeed, Council has debated a widening of membership on several occasions, and confirmed repeatedly a restrictive interpretation of Article II, whereby membership remained reserved for European countries. Only in 2010 did Council approve the most radical shift of paradigm of CERN's membership policy to date, embedded in a policy of "geographical enlargement" and opening full membership to non-European states, irrespective of their geographical location. At the same time, Council introduced the new instrument of associate membership to facilitate the accession of new members, including emerging countries outside Europe, which might not command sufficient resources to sustain full membership in the foreseeable future.

CERN's new membership policy follows a twofold rationale. It reflects the globalization of particle physics, which in turn has become a prominent paradigm for the globalization of science at large, and it prepares CERN for its long-term future. Since 2004, the community of CERN "users" has grown from just above 6000 to almost 11,000 scientists and engineers. This dramatic growth has been driven by non-member states more than by the member states. Whereas the numbers are dominated by North America, in recent years the most important growth rates have been observed in communities from Asia and Latin America, where new players emerge on the field of international science. Particle physics has a strong tradition of defying political and geographical boundaries. CERN's new membership policy underpins, in part, the global migration of the particle-physics community, which reflects the scientific attractiveness and success of the LHC.

More important, geographical enlargement is a first step in preparing CERN's membership and governance for the post-LHC future. Whereas the LHC experiments today are truly global operations, the LHC machine was built as a predominantly European project, with a technically and politically important contribution of about 10% from outside Europe, mostly provided in kind.

This model is not likely to work for a large next-generation facility in Europe. With the CLIC and FCC studies, CERN is exploring two different, challenging avenues to prepare its future, and the future of the field, after the LHC. No cost estimate exists yet for the various options, but it seems inconceivable that any of them could be approved and built within the same membership, governance and funding structures that worked 20 years ago – successfully, but under great labour pains – for the LHC.

With 10 applications for membership or associate membership received from countries of varying size, and from inside and outside Europe (Brazil, Croatia, Cyprus, Israel, Pakistan, Russia, Serbia, Slovenia, Turkey and Ukraine), during the past four years, the enlargement process has made a promising start. Some of the accession procedures have been completed (Israel has become CERN's 21st member state), Serbia is an associate member in the pre-stage to membership, and other accession procedures are expected to conclude in the near future. (Romania, which applied for membership before the introduction of the new policy in 2010, has been integrated *a posteriori* in the same accession procedure as the other, more recent applicant states.) Other countries that would seem natural candidates acknowledge the promise and potential of a continued scientific and technological partnership, but have remained absent so far, or are hesitant on political or financial grounds.

More work, stamina, and patience will be needed to enlarge the membership of CERN to a size that is commensurate with its future ambitions in quantity and quality. Moreover, not all states that are obvious candidates for a closer scientific and technical partnership might share today the values of a governance that is excellence driven and consensus oriented, and that has prevailed most of the time in CERN's 60-year history. In the long term, broadening the institutional base without sacrificing the traditional values of European co-operation that have been a key ingredient in CERN's past successes is likely to emerge as the true challenge of the enlargement process.

● Rüdiger Voss and Emmanuel Tsismelis are CERN's head and deputy head of international relations, respectively.

New multi-channel scaler for photon counting applications

The MCS-CT3 is a new multi-channel scaler/counter-timer from ET Enterprises Ltd which can be interfaced with a PC or Laptop via a USB port to operate as a cost-effective, high performance pulse counting instrument. When used with a compatible amplifier/discriminator, such as the ET Enterprises AD8, and a suitable detector, it becomes a wide-dynamic-range photon counting system.

It is a compact electronics module which records pulse counts as a function of time and stores them in channels, each of which has a user-selectable time window, or 'dwell-time'. Operation and data retrieval are controlled by a PC using Windows XP, or later, operating systems and the open-source software supplied with the MCS-CT3. A LabVIEW virtual instrument program option is also supplied.

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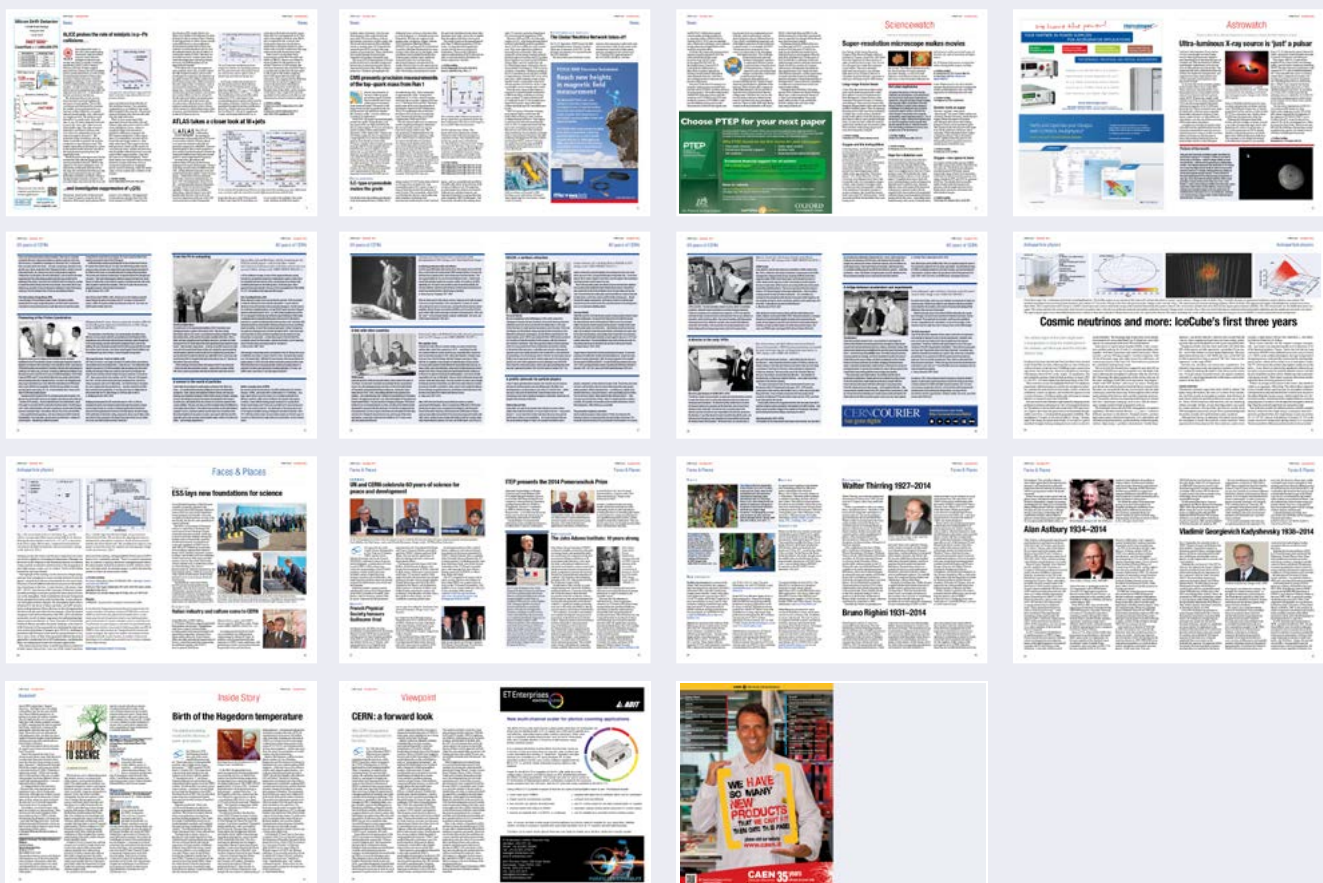
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WELCOME

CERN Courier – digital edition

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

As CERN's 60th-anniversary year comes to an end, *CERN Courier* gives a voice to some of the organization's pioneers who are no longer with us. Extracts from audio recordings in CERN's archives bring to life the spirit of adventure of the early CERN. One of the studies that CERN pioneered was the measurement of the “g-2” parameter of the muon – an experiment that in its latest incarnation is setting up in Fermilab. The year also saw the 50th anniversary of the International Centre for Theoretical Physics in Trieste, and an interview with the centre's current director reveals interesting similarities and contrasts between the two organizations. The end of the year also offers the traditional seasonal Bookshelf. Happy reading!

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