In this issue:
- 60 years of science for peace – proud members from the start
- A Royal celebration – celebrating a bright future
- Another special visit
- Simulating success
- Particle Fever on BBC4
- Dates for the diary

60 years of science for peace

60 years ago the countries of Europe were still bruised from the effects of war. Governments were coming to terms with a new world order, and it was a bold (and perhaps fanciful) idea that the shared pursuit of a common scientific goal could bring countries together, transcend political and ideological differences, and halt the brain drain to science projects in the US. But CERN did. And it has continued to do so ever since.

Right from the start, the UK has been a member of this unique organisation, with UK nationals, and researchers from UK universities, involved at every level of CERN.

Theoretical physicists such as Peter Higgs and Sir Tom Kibble set ambitious scientific challenges. Particle physicists such as Alan Astbury, John Dowell, Peter Kalmus, and Jim Virdee embraced those challenges, and proposed complex experiments to prove or discount the theories.

Engineers such as Steve Myers took these ideas, transformed them into tangible designs and delivered huge, intricate machines capable of probing the origins of our Universe.

Accelerator scientists such as Eifionydd Jones and Lyn Evans pushed the limits of technology to build a succession of machines that can accelerate particles to almost the speed of light.

As Directors-General of CERN, John Adams and Christopher Llewellyn Smith provided the visionary leadership and determination to maintain scientific excellence.

But of course, none of these people worked in isolation. They were surrounded and supported by a community who shared their passion and drive.
It is impossible not to be impressed by CERN’s ambitious scientific goals, by the scale of the engineering, and by the overwhelming sense of collaboration. Young researchers make a full contribution to the scientific programme, encouraged and supported by more senior colleagues. Everywhere that you look, knowledge is being transferred. And that philosophy extends to industry too.

CERN is a demanding customer and it has pushed UK companies to develop new capabilities that can open up new markets and create new jobs. Each new scientific goal creates a myriad of technical challenges. Developing new technologies and ways of working is part of CERN’s DNA.

“Vague, but exciting” was the initial response to Tim Berners-Lee’s IT solution to help CERN physicists around the world communicate and share data. 25 years later, it is impossible to imagine life without the World Wide Web; it has become an essential tool for international business, entertainment and leisure.

In 1954, the challenge was to bring scientists from different nations, cultures and backgrounds together in pursuit of scientific excellence. Today, the challenge is how to harness this scientific excellence and ensure that it is relevant to the challenges that our global society faces.

The technology used to accelerate particles in the Large Hadron Collider, or for detectors like those used in the LHC experiments, has the potential to be used beyond particle physics. In the UK, the CERN STFC Business Incubation Centre is a pilot project to help entrepreneurs and small businesses apply technology developed for CERN to new areas. Technical and financial support is available to give these new businesses the best chance of success.

Keeping up with the pace of scientific change is not easy and more than one thousand UK school teachers have taken part in CERN’s teacher development programme. Meeting and listening to researchers working at the very frontiers of science is inspiring and they return to their schools with their passion for physics re-ignited. Many teachers come back to CERN year after year with their students.

There is no doubt that ‘seeing is believing’, and countless high school students have been inspired to pursue careers in computer science, engineering or physics after a visit to CERN.

It is the scientific discoveries for which CERN is best known, but these are impossible without the best administrators, computer scientists, engineers and technicians.

If you want to work at CERN, ingenuity, creativity and curiosity are essential. In this international environment where UK personnel are working with colleagues from around the world, it is not your nationality that matters, just your ability to excel at what you do.

**A Royal celebration**

As part of the celebrations for CERN’s 60th anniversary, HRH Duke of York led the UK delegation at a formal celebration on 29 September.
The Duke takes a particular interest in science, engineering and technology (he is patron of the UK’s national science and innovation campuses at Harwell and Daresbury) and skills development, so the visit included the opportunity to meet early career researchers from across CERN. Paul Collier, Head of CERN’s Beams department hosted the visit, assisted by post docs Sudan Paramesvaran (Bristol and CMS) and Kara Lynch (Leuven and ISOLDE).

This was the Duke’s second visit to CERN – he saw the ATLAS experiment in 2004 during its construction phase. This time, he went underground at CMS and his guides for the visit were Jim Virdee, post doc Sarah Malik and PhD student Matt Citron, all from Imperial College.

Having clearly been inspired by CMS, the Duke was keen to find out more. Clara Nellist (LAL and ATLAS) was one of the early career researchers who joined the Duke for lunch, “he had many questions about particle physics theory and the methods by which research at CERN is performed.”

“He asked some probing questions that even gave us pause for thought,” added Kara. “I talked to him most about my work at the ISOLDE facility, and how there are many UK scientists and institutions that are heavily involved in the nuclear physics programme here at CERN. He even joked that smaller experiments, such as ISOLDE, must mean much more intelligent people - but I couldn’t possibly comment on that!”

The Duke recalled a statistic that had been quoted to him during the tour – that there are 40 million LHC collisions per second. “He was amazed that we want to look at all that data,” said Sudan, “I explained to him that actually we only ‘glance’ at that data and then filter it using our Trigger systems so that we only store a small fraction of those 40 million collisions. He was impressed by this fact. It was an interesting question and showed he understood one of the major tasks that the LHC experiments have to tackle.”

Technician Fellow, Elliott Rose was also part of the lunch group, “To be one of the six people chosen to represent younger people working at CERN was, and is, a privilege. I thoroughly enjoyed the experience of meeting the Duke and he made the atmosphere very relaxed which definitely helped with settling the nerves. He was very interested in the goals we have at CERN and asked the sort of questions that I was asking when I started here, and still do ask.”

Clara agrees, “It’s fantastic that young scientists representing a range of research and technical areas were able to discuss our experiences with the Duke of York and distinguished UK scientists. The 60th anniversary is a time to celebrate the achievements that CERN has made since the end of World War Two, but also to look forward to the challenges and opportunities that lie ahead for the next 60 years. This will be our responsibility.”

Another special visit
By Sophie Hetherton, Communications Intern

On 10 October, CERN received a special visit from Alfriston School. The Buckinghamshire School caters for girls with a wide range of special educational needs and disabilities.

Dave Waterman, a science teacher at the school, received a public engagement Small Award from STFC to enable the group of girls and accompanying teachers to visit CERN as part of a project to boost the girl’s confidence and interest in physics. The aim is that the girls can share first-hand experience and their enthusiasm back at home by being role models for others.
and inspiration within the school and for the wider community. By building pupil’s self-esteem in learning science, the project aims to encourage students to develop the confidence to go on to study science or engineering related subjects after leaving school.

Dave first visited CERN as part of the UK teacher development programme in December 2013, which was when the idea of bringing his pupils over for a visit was first suggested. “The main challenge with a visit of this kind is finding how to engage the pupils who don’t have much knowledge of maths,” says Dave. This task was more than successfully tackled by Dave Barney (CERN and CMS) who hit the level spot-on with an engaging introductory talk just before the detector visit.

“This visit is a fantastic opportunity for the girls on both an educational and personal level,” says Dave W. Indeed, for one of the pupils, Laura, this was her first journey out of the UK and on a plane, “the whole trip has been so exciting; my highlight was seeing the detector because it was so much bigger than what I thought!” This feeling was echoed by many of the other students who all exclaimed surprise and awe as they entered the detector area 100m underground.

The students were also accompanied by Olivia Bailey, a final year chemical engineering student at the University of Bath, who recently completed a technical studentship working on the ALICE experiment. “Being involved in this outreach project was really fun and was a great way of using my experience at CERN and sharing it with others.,” says Olivia. Needless to say the visit was a great success and hopefully the first of many more of its kind.

Simulating success

The ATLAS Outstanding Achievement Awards 2014 were given on 9 October to individuals or teams of physicists and engineers for their contributions during the LHC’s first run in all areas of ATLAS except physics analyses.

Nominations were received in 19 different categories and the Collaboration Board Chair Advisory Group made the final selections. “The award is meant to be helpful in career development. Not only in ATLAS but in life, everyone needs recognition,” said Howard Gordon, chair of the Collaboration Board.

Congratulations to John Chapman (Cambridge) who was recognised for his work in ATLAS simulation, especially in developing, maintaining and coordinating the ATLAS pile-up simulation and digitisation. He dedicated the award to everyone who works in simulation in the collaboration.

Particle Fever on BBC4

Particle Fever, the highly acclaimed film by Mark Levinson about the start-up of the LHC and the search or the Higgs boson was shown on BBC4 recently. If you missed it, it’s still available on iPlayer.

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Diary dates

CERN Council – 8 - 12 December
CERN closed - 20 December – 4 January 2015
A world a particle in Liverpool - until 8 January