

AWAKENING THE POTENTIAL OF PLASMA ACCELERATION

Civil engineering has begun for the new AWAKE experiment, which looks to push the boundaries of particle acceleration. This proof-of-principle experiment will harness the power of wakefields generated by proton beams in plasma cells, producing accelerator gradients hundreds of times higher than those used in current RF cavities.



Civil engineering works are currently ongoing at the AWAKE facility.

As one of CERN's accelerator R&D experiments, the AWAKE project is rather unique. Like all of CERN's experiments, AWAKE is a collaborative endeavour with institutes and organisations participating around the world. "But unlike fixed-target experiments, where the users take over once CERN has delivered the facility, in AWAKE, the synchronised proton, electron and laser beams provided by CERN are an integral part of the experiment," explains Edda Gschwendtner, CERN AWAKE project leader. "So, of course, CERN's involvement in the project goes well beyond providing infrastructure and services."

Preparations are already underway, as CERN teams set out this summer to remake the CNGS area into a home for AWAKE. "We have removed part of the proton beamline and cleared the area upstream of the CNGS target to make way for the AWAKE installation, including a laser and 10 metre plasma cell," explains Edda. "CNGS's area downstream of the target, however, has been left untouched. As it is radioactive, we constructed a new shielding wall in July so that the AWAKE facility upstream can be a safe, supervised working area for users."

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SAFETY ON OUR ROADS

It's almost the end of August, and many of us are returning to CERN after a well-earned rest.

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A word from the DG

SAFETY ON OUR ROADS

For those with children, it's time to prepare them for school – and those of us who drive often see signs to remind us that the schools are re-opening and that we should take care.

Of course, we should all take care while driving at any time, and this is just as true at CERN as anywhere else. You may already have noticed that new “traffic-calming” measures have been set up near Restaurant 2, to encourage drivers to slow down to

safe speeds. I wish we did not need to do this, but it has been necessary as there have been many reports of unpleasant and dangerous, even life-threatening, behaviour by drivers.

I'd like to take this opportunity to remind us all to drive with consideration and respect for everyone who uses the CERN site and shares the same thoroughfares – pedestrians, cyclists and motorists alike. The CERN Code of Conduct states that we

should “promote and maintain a safe and healthy environment, following relevant safety rules”. This is as true of driving at CERN as of any other activity. So let's show some respect and keep our site safe.

Rolf Heuer

AWAKENING THE POTENTIAL OF PLASMA ACCELERATION

The AWAKE facility will also feature a clean room for the laser, a dedicated area for the electron source and two new tunnels for two new beamlines: one small tunnel to hold the laser beam (which ionises the plasma and seeds the wakefields); and a second, larger tunnel that will be home to the electron beamline (the “witness beam” accelerated by the plasma). These new tunnels are currently being carved out for the facility (see image).

While these works are ongoing, the AWAKE team at the Max Planck Institute for Physics in Munich is preparing to move both equipment and know-how to CERN. “In Munich, we are working with a 3-metre prototype of the plasma cell,” says Allen Caldwell, AWAKE Spokesperson. “Our focus is on the science: learning the properties of the plasma cell as well as possible before we start with the ‘real thing’. For example, we need to ensure that the temperature of the plasma in the cell is uniform and that the laser induces reliable wakefields.”

“In addition to this, we are also addressing a number of hardware issues,” adds Patric Muggli, AWAKE Physics and Experiment Coordinator. “For example, we are creating valves that allow the laser, proton and electron beams to enter the plasma cell. These need to be extremely fast but also durable, opening and closing an unprecedented 40,000 times in their lifetime.”

Although new technology is being created for AWAKE, the experiment also re-uses existing equipment from CNGS and other CERN facilities: “The CLIC/CTF3 collaboration has agreed to provide their PHIN electron source

and their expertise for the AWAKE facility, in addition to a number of klystron elements for the electron source,” says Allen. However, modifying the PHIN electron source to fit the needs of AWAKE will require considerable work from CERN staff and collaboration members.

The experiment will be conducted in two phases, the first starting in 2016. “We first need to prove that the plasma cell is creating accelerating wakefields, showing that the self modulation is working and can be controlled,” concludes Edda. “Once we have studied this phenomenon in detail, we will then use the wakefields to accelerate the electron witness beam. This will take us up to LS2, by which time we hope to have a good assessment of the potential of proton-driven plasma acceleration.”

Katarina Anthony

(Continued from page 1)

(Continued from page 1)

LS1 REPORT: A HIGHLY CHOREOGRAPHED BALLET IN THE SPS

With only one short month left until beam, the SPS teams have been kept busy with powering and operations tests. Alongside this demanding work, they have also successfully removed and replaced four key elements of the accelerator.

Since beginning their hardware-testing phase in early July, teams have been carrying out Electrical Power Converter tests and a wide range of start-up tests for the various equipment groups. Slotted amongst this busy schedule of tests were the final checks of the accelerator's magnets and beam dump. “There are three main types of magnet faults and we found we had one of each: an electrical fault (short circuit) in the magnet, a water leak (as the magnets are water cooled) and a vacuum chamber leak,” says David McFarlane, the SPS technical coordinator from the Engineering Department. “On top of that, there was a problem with the main beam dump, which meant it also had to be replaced. In the end, rather than stopping the tests for each move, we decided to replace all four elements in one go.”

From 10 August to 12 August, the three magnets and beam dump were removed and replaced with spares in the SPS tunnel. “The logistics for this move were complex, as not only are the magnets and beam dumps extremely heavy, the chariot and lifting equipment used to move the items is a whopping ten tonnes,” says McFarlane.

“Furthermore, they are big pieces of equipment that take up the entire width of the tunnel. So coordinating which vehicles and teams were where and synchronising their movements was vital.”

Although the SPS teams are well-versed at replacing magnets (swapping as many as four magnets in a two-day short technical stop), replacing the beam dump proved a tougher challenge. As the dump is radioactive, the length of transport had to be kept as short as possible and moving the dump from the tunnel to the radiation storage area could not take place if it rained! With this in mind, the Operations team created detailed plans for the move, providing hourly updates and back-up solutions in case of rain. “It was like a highly choreographed ballet - everything was well-timed and perfectly in synchronisation,” confirms McFarlane.

Despite these replacements, the SPS is still on schedule to take beam from the PS in early September. The accelerator will be operational in October, providing beams to the North Area.

Katarina Anthony

Meanwhile, elsewhere...

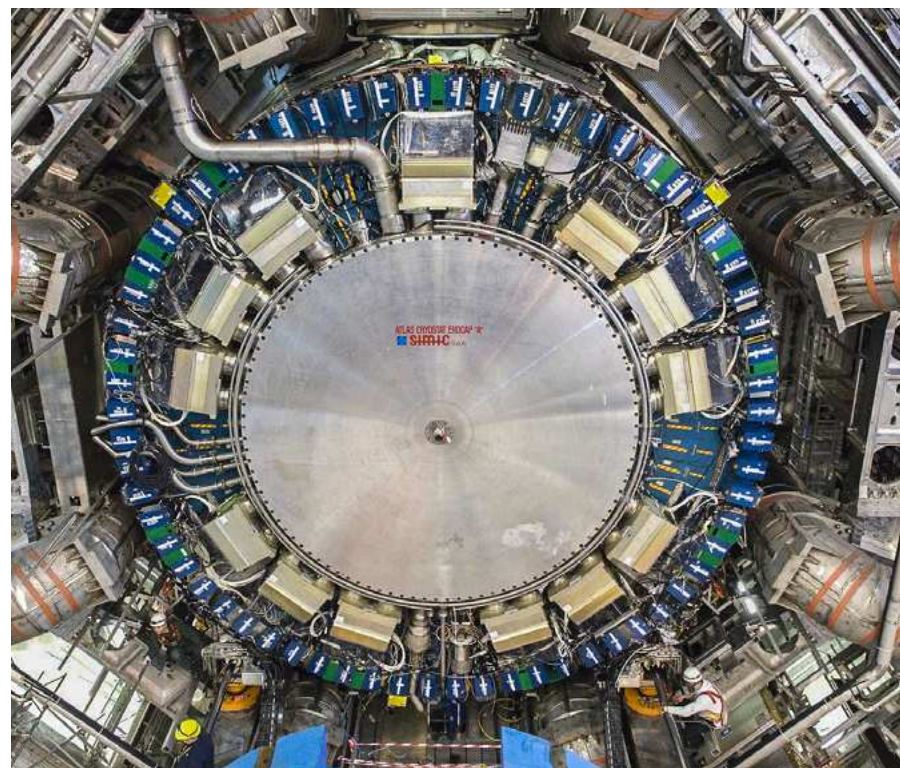
At the LHC, the cooling of sector 1-2 is still in progress. The cooling of sector 5-6, which was next on the list, started at the end of last week. The vacuum teams are currently checking for any final leaks and carrying out sealing tests in various sectors.

At the same time, the CSCM tests (Copper Stabilizer Continuity Measurement) are in progress in sector 8-1, and will eventually be carried out throughout the machine. This week the first power tests will begin in sector 6-7, which will therefore be the first sector ready for beam. Electrical validation tests are in progress throughout the machine, along with instrumentation tests, particularly on the beam loss sensors. All of the collimators, the kicker magnets and the beam instrumentation in the straight sections of the LHC are now installed and under vacuum.

At the SPS, hardware tests revealed a damaged TIDVG (Target Internal Dump Vertical Graphite). It has now successfully been replaced and the machine is ready for testing of the power converters to recommence, in advance of the restart in October.

AN IRON HAND IN A VELVET GLOVE

The various parts of the ATLAS detector were designed to be moveable, just like in a toy construction set, allowing access to the sub-detectors inside. However, unlike toy bricks, the components of this giant of physics weigh up to 1000 tonnes and need to be repositioned with a precision of as high as 300 microns.



The ATLAS endcap calorimeter. This element, weighing 1000 tonnes and measuring 9m in diameter, is the most difficult to move.

It's certainly not child's play: opening and closing the ATLAS detector takes several weeks and requires the expert eye of the team who developed the system. It involves moving no fewer than 12 elements that weigh a combined total of 3300 tonnes. "Each element is several metres in diameter, and that increases to 25 metres for the biggest ones – the large muon wheels," explains Michel Raymond, the engineer leading the team responsible for the closing and opening of the ATLAS experiment. "The sub-detectors sit on air cushions that slide along rails nine metres above the ground (see picture 2). The whole thing is controlled by two automated units, which we've fine-tuned over the years that the machine's been running."

The post-LS1 closing operation began on 7 August and will continue until the end of September. This year, for the first time, the sub-detectors will be repositioned with a precision of as high as 300 microns. "In order to achieve that, we installed sensors during LS1 that give us information on the relative positions of the different elements," explains Frédéric Rosset, a member of the technical team. "The detectors are moved with all their 'accessories' – things like electrical cables,

flexible chains containing cryogenic lines and fibre optics. We have a tolerance of barely three millimetres during these manoeuvres. The equipment that we're moving is very delicate, so we have to handle it as if we're using an iron hand inside a velvet glove!"

It takes about half a day to move one element and put it back in its original position with the required precision. The operation is always carried out by the technical team (comprising around 15 people) under the watchful eye of the physicists responsible for the detector. "We have eyes everywhere while this is going on," stresses Cédric Sordé, another member of the team responsible for the opening and closing of ATLAS. "Our machines are very reliable, but nothing beats an expert eye, which is why we monitor and check everything step by step."

As the sub-detectors are gradually put back in their original positions, boxed one inside the other, the technical teams gain more and more space to manoeuvre, while the physicists gradually lose access to the detectors. "All the upgrade work on the sub-detectors planned for LS1 has to be done before the elements in question are put back

in place," Raymond explains. "Only the muon chambers, on the outside of the detector, will remain accessible during and after the closing operations."

Once the enormous detector has been fully reassembled, the physicists will test the functioning of all systems to ensure that the giant is ready for operation as soon as the LHC collisions begin in 2015.

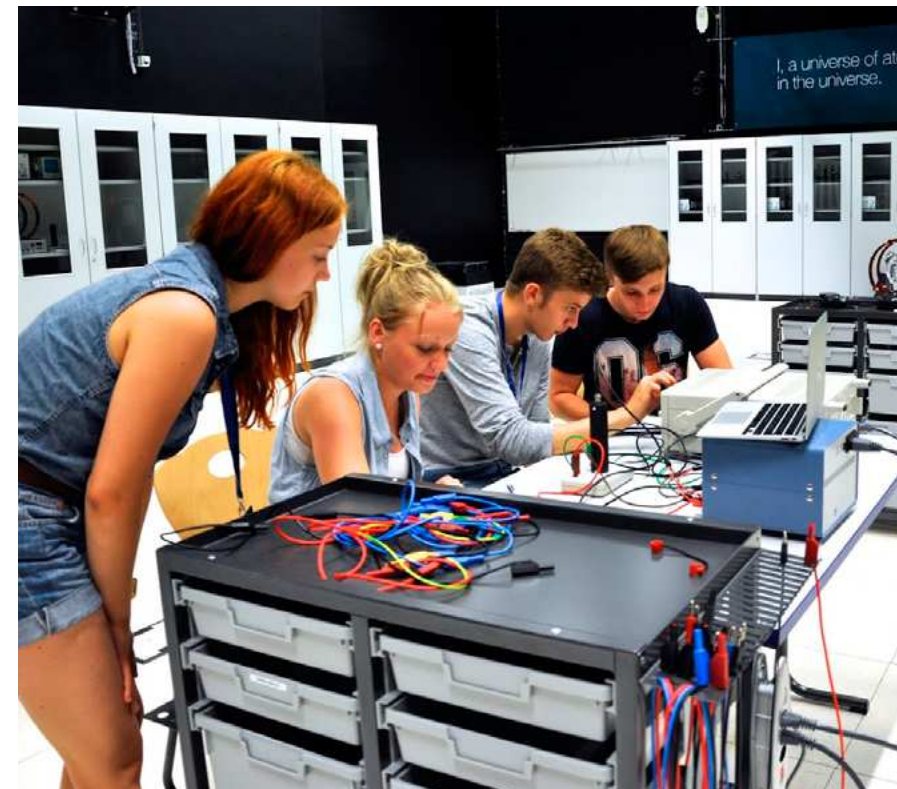
Antonella Del Rosso



The discs are the air pads that allow the detector to slide along the rails.

READY TO DON A WHITE COAT?

What better way to learn than to try yourself? That's the idea of S'Cool LAB, a new teaching laboratory: it offers school-children visiting CERN the chance to take part in a half-day practical workshop in a purpose-equipped lab.



S'Cool LAB's first pupils testing the new laboratory. Photo: Jeff Wiener.

S'Cool LAB, which originated from an idea first suggested about 15 years ago, was launched on 3 July and will start to welcome pupils by early 2015. "This new lab is housed in the lower part of Microcosm, where the UA1* experiment detector was previously on display," explains Jeff Wiener, who led the project to set up S'Cool LAB at the same time as completing his thesis in the field of education. "It's now known as Building 143-R-003. For more than a year now, we've been putting up dividing walls to separate the lab from the rest of Microcosm, and we've fitted it with a smart floor (with electrical and internet sockets in several places), numerous storage units, a giant screen, a bookshelf and 12 adaptable work-stations." With a surface area of almost 200 m², S'Cool LAB is now ready to host up to 36 young people and their teachers.

"We started testing the S'Cool LAB concept as early as 2010," says Sascha Schmeling, who came up with the idea for the project. "But without a dedicated lab, the conditions weren't ideal for receiving pupils visiting CERN." With around 15 experiments already, covering three areas of experimental physics (basic principles, acceleration and detection), S'Cool LAB takes practical workshops up a

gear. Some of the more notable experimental devices on offer include electron tubes, Paul ion traps, X-ray machines, Rutherford experiments, MediPix detection systems and even a modern cloud chamber... enough to satisfy even the biggest appetites! "We have three of each of these experiments," says Julia Woithe, who's writing her thesis on the S'Cool LAB project. "This will allow several work groups – each made up of three or four people – to carry out the same investigations at the same time. We're hoping to introduce even more experiments in the years to come."

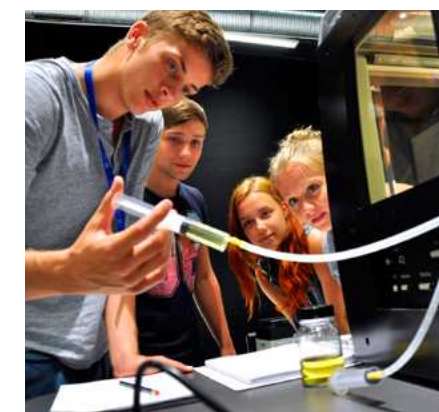
Funded by CERN and, having grabbed its attention, the *Loterie Romande*, S'Cool LAB gives young people access to equipment that they would never have had the chance to use elsewhere. It will enable them to test out some of CERN's discoveries on the very site where they were made.

**The UA1 experiment, a souvenir of the discovery of the W and Z bosons, has since been installed in the Microcosm gallery.*

Anaïs Schaeffer



A fine beam tube, one of the many experiments featured in S'Cool LAB. Photo: Jeff Wiener.



The first experiments using the X-ray machine... Photo: Jeff Wiener.

S'Cool LAB is looking for activity leaders!

Are you a member of the CERN personnel and would you like to host S'Cool LAB's practical workshops? Contact the team at scoollab-admin@cern.ch!

Watch the S'Cool LAB video:



DISCOVER POPSCIENCE ON RESEARCHERS' NIGHT

On Friday 26 September 2014, CERN will be celebrating European Researchers' Night at three venues in Geneva and St. Genis-Pouilly. Inspired by Andy Warhol, this year's theme is "Pop science is for everyone".



Every year, on the last Friday of September, the European Researchers' Night takes place in about 300 cities all over Europe, with funding from the EU, to promote research and highlight researchers in engaging and fun ways for the general public.

Andy Warhol said, "Pop art is for everyone". This year, "Pop science is for everyone" is the motto of the Researchers' Night event organised by CERN and its partners*. The night will offer everyone the opportunity to learn about the latest discoveries in physics and cosmology through poetry, theatre and music. This will be in addition to the event's traditional activities for the general public.

To attract new audiences, the event will be held at three locations outside CERN: at FNAC Rive and Théâtre de la Madeleine in Geneva, and at Théâtre du Bordeaux in St. Genis-Pouilly. Here are some of the highlights of the very rich programme:

Poetry

Six European poets, selected by the World Academy of Poetry, visited CERN to meet physicists and to be inspired by the laboratory. Their poems will be unveiled at FNAC at 6 p.m. in the presence of Hubert Reeves and the poets themselves.

Theatre

Through "Origins", a multi-arts theatre show created by Marie-Odile Monchicourt and Michel Spiro staged at the Théâtre du Bordeaux in St Genis at 7 p.m., the audience will experience the quantum vacuum and debate with the artists and scientists involved, among them Hubert Reeves, Etienne Klein and Michel Spiro.

Science Cafés

FNAC's Urban Café will be the stage for a series of Science Cafés, where CERN scientists will entertain the audience with stories of the particles that are pushing the frontiers of knowledge, as well as medicine, music and the arts. The final café to close the night, entitled "Big Bang, Higgs, Les exoplanètes... et moi?" will be at the Théâtre de la Madeleine in Geneva at 10 p.m. and will star Hubert Reeves, Etienne Klein, Michel Mayor and Fabiola Gianotti.

Ask a Researcher

CERN's researchers will "occupy" two floors of FNAC Rive. All the screens in the shop will feature videos and animations about the discovery of the Higgs boson, the LHC, the spin-offs of particle physics and much more!

Activities for kids, quizzes, games, music based on LHC data, a photo exhibit devoted to "collisions" and liquid nitrogen marshmallows will complete the programme of this very special night!

*POPSCIENCE Partners: Subway edizioni, the Origins Association, The World Academy of Poetry, the University of Geneva, FNAC and the Mairie de St Genis-Pouilly.

For more information and updates on the programme visit: www.pop-science.eu: www.pop-science.eu.

The POPSCIENCE Team

Volunteers for POPSCIENCE wanted

The POPSCIENCE organisers at CERN are recruiting volunteers for the "Ask a Researcher" event or as support staff for the other activities. Shifts start at 4 p.m. and finish at 10 p.m. on Friday September 26. A good level of spoken French would be appreciated. In return: POP T-shirts, food and drinks, and a lot of fun!

Register at: cern.ch/popscience.

Contact: pop.science@cern.ch.

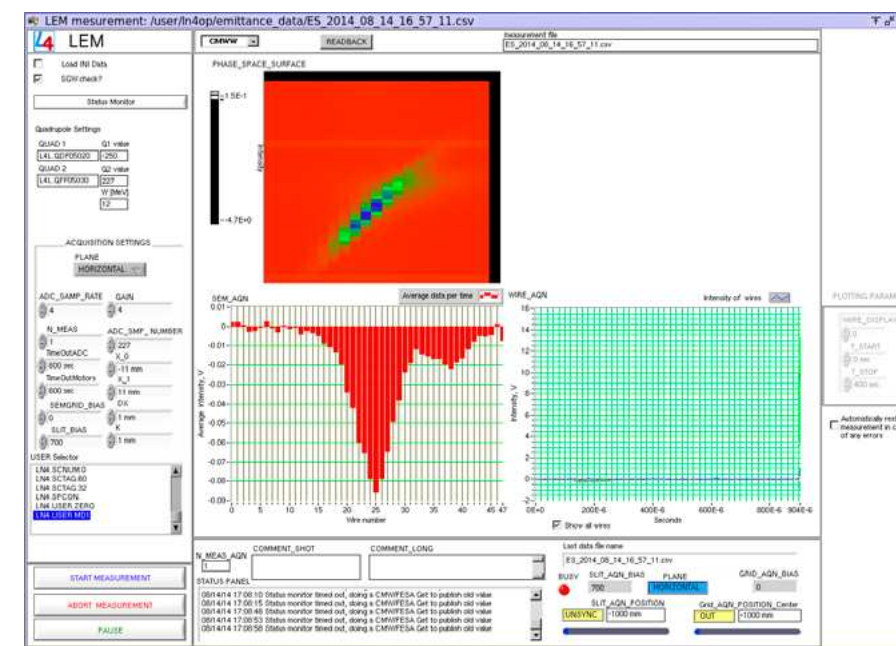


Poets at CERN:



FIRST BEAM IN LINAC4 DTL

Following the installation of the Linac4 Drift Tube Linac (DTL) earlier this summer, the first DTL tank saw beams at 12 MeV on 5 August.



Transverse emittance measured at 12 MeV after the DTL tank 1 using a temporary slit-and-grid emittance device.

You never forget your first beam. That was especially true for the Linac4 DTL team, as it followed years of design, construction and vigorous testing. "We performed countless measurements of the geometry, vacuum and magnet polarisation of the DTL tanks

while we were in the workshop," says Suitbert Ramberger, project engineer for the Linac4 DTL. "Add that preparation to the excellent RF conditioning that we carried out in the weeks before the beam tests and I was confident that the acceleration with beam would fully

meet expectations!" Indeed it did. Beam commissioning tests ran until 21 August and found the DTL operating with nominal transmission.

This successful run has confirmed the innovative design of the DTL elements. "The DTL tanks were designed to require very little tuning," explains Alessandra Lombardi, who is heading up Linac4's commissioning. "This is an excellent feature, but would have left us with little manoeuvrability if it hadn't worked! But this 12 MeV beam has shown that the DTL design is faultless."

With this latest success under their belts, the Linac4 team looks ahead to their next challenge: bringing beams into the next two DTL tanks!

Katarina Anthony

Behind the scenes of GS

SECURITY AFFECTS US ALL

A CERN manager, supported by two outside companies, manages the three entities in the GS Department that are in charge of various aspects of security. In total, about 80 people, 300 cameras, a surveillance centre (CSA) and 22 kilometres of fences are responsible for ensuring that the Organization is secure. But in spite of these significant resources, the best strategy for maintaining a good level of security at CERN is the active support of its users.

CERN's security service covers three main areas: access control, comprising the security guards and a patrol service that ensures the site is secure and monitors compliance with traffic and parking rules; registration; and locks and keys.

The 22 guards on the day shift and the seven on the night shift, who constantly monitor access, are spread across the two main sites and the four experiment sites. "The guards' main job is to

check that only those who are authorised to do so enter the site," explains Didier Constant, head of security at CERN. "They also carry out random searches and patrols to ensure that the parking rules are respected."

In fact, parking is a major problem, for users as much as for the guards, given that, out of some 5,000 parking spaces available, around 350 are occupied by "squatters", i.e. cars that have been

abandoned by their owner on the Organization's site.

"When the security guards report abandoned vehicles, we launch a process that can lead to the car being removed," warns Constant. "Unfortunately, this is not the only incivility we see. We also often find cars parked in disabled spaces, in front of emergency exits or next to fire hydrants."

So mind where you park! It's also worth noting that a completely new car park with 295 places – which are often empty – has recently been made available next to the Globe (see box).

Keys and access cards: use them!

CERN has more than 20,000 doors, about 20 different locking schedules, and 32,000 keys and 9,000 lock cylinders permanently in stock. All these locks are definitely necessary, as sadly thefts and petty crime are on the increase. Even though the guards spend a lot of time analysing videos, checking access and patrolling the site, unfortunately this is not always sufficient and criminals sometimes succeed in getting into the buildings. "Video surveillance sometimes allows us to identify the culprits, but it doesn't allow us to solve every case," laments Constant. "Property doesn't protect itself. Everyone must take responsibility and do what they can to protect their own belongings and the Laboratory's property."

Recently, a CERN user who had noticed the presence of an unfamiliar person in his working area was able to help the guards to foil a criminal. "The person was behaving strangely was in a car, and when he noticed him, the CERN user created a Service Desk ticket and sent it to the security control room," explains Constant. "We carried out some checks and the vehicle was not registered at CERN. We sent out a patrol team, checked the cameras and found him at SM18. He had parked his car outside and gone in on foot. When we stopped him, he told us he was collecting scrap metal. We communicated his identity to the Swiss authorities and it turned out that his intentions were not very honest"

Security affects us all. And this applies right from the moment we register at CERN. "It's a tricky job," emphasises Constant. "We issue around 22,000 access cards each year, with peaks of around 700 per week, particularly at the start of the year when lots of new people arrive at CERN, and at the start of July, when students and trainees arrive."

Important synergies

The security guards are also there to help other vital services to carry out their work in ensuring the safety and security of the Laboratory's users. "We try to create a lot of synergies with the other GS services, particularly with ASE, which manages access to the machines, as well as the security cameras and number-plate readers, but also with the Medical Service, in terms of allowing access to the emergency services when necessary (particularly ambulances, which we must be able to direct to the correct location) and the Fire Brigade, so that we can develop emergency plans together," notes Constant.

The security guards therefore have many different tasks. However, there is one thing they are not supposed to do in the course of their work: tolerate disrespectful behaviour from users. If you are unhappy and need to contact someone about a security issue, use the Service Desk. They will know to whom to direct your complaint... but it certainly won't be to the security guard himself, who is just trying to get people to respect the rules.

Antonella Del Rosso

The Globe car park

With 295 spaces reserved for CERN (and visitors to CERN), 100 P+R spaces, 15 spaces for buses, 26 spaces for motorcycles and one taxi space, the Globe car park is an ideal location to park your vehicle, as you are almost guaranteed to find a free space.

The car park is accessible to all vehicles registered at CERN (CERN car sticker), as well as to a maximum of 100 P+R subscribers and all visitors (professional or otherwise) during their first visit. For subsequent visits, they must go to Building 33 to register their vehicle before they can use the car park again.

conducted on Facebook manipulated users' news feeds so that half of the unwitting participants were presented with more positive content while the other half received more negative content. The study found that the participants' moods were not significantly altered, but the damage was done: Facebook had exercised the means to manipulate the information that forms the thoughts, attitudes and opinions of its users... In addition, with Google's profiling capability, which allows it to know what we are interested in, who can guarantee that our searches produce objective results? For example, if I search for "wine Côtes du Rhône", do I (someone who prefers juice) get exactly the same results as a connoisseur? Google might not use this capability, but the potential is there. Thus, Orwell was quite right on that point.

With the dominance of just a few big search engines and media outlets, this also opens Pandora's box to alter the past (in fact, powerful stakeholders have rewritten history again and again!). Some nations already block websites with undesirable content, opinions and suchlike. In the future, in addition to showing us only what we like to see, major search engines could also completely delete unwanted information from their archives — possibly including not just information subject to the "right to be forgotten" but also information contradicting their values or opinions. Therefore, Orwell is potentially right one this one, too.

Finally: "Big Brother". Governments' permanent monitoring of their citizens has already been discussed in past *Bulletin* articles (e.g. "Security vs. Nations: a lost battle?"). But instead of "Telescreens" spying on us, many of us willingly deploy the means ourselves: smartphones track us as we roam around; social media aggregates our opinions and feelings; cloud services store our private data; mobile webcams or Google Glass record what we see at a given moment; even our health status can be transmitted to dedicated web portals using smart wristbands; and soon we could all have cute little Jibo robots assisting us in our homes.

Thus, (too?) often we voluntarily give away data in exchange for a few extra amenities. But sometimes it's against our will: certain LG TV screens were found to be recording and transmitting back information on the viewing habits of their users and Microsoft's new Xbox One Kinect camera was suspected of doing so too. In the near future, SmartMeters will monitor our energy consumption in detail, enabling energy companies to predict whether we are at home and what we are doing. In summary, Orwell was once more on the right track, but he wildly underestimated the extent of monitoring by governments and ignored the monitoring efforts of private companies and our willingness to comply.

So, how close was Orwell to today's interconnected world? He wasn't. We have gone far beyond what George Orwell

imagined, and we should start discussing the social implications of this and our personal responsibility. For a start, we could rethink what we expose on Facebook, Google+ and Twitter and we could use, for example, DuckDuckGo or StartPage as alternatives for web searches.

Share your ideas! Check out our website for further information, answers to your questions and help, or e-mail **Computer.Security@cern.ch**

If you want to learn more about computer security incidents and issues at CERN, just follow our Monthly Report: **https://cern.ch/security/reports/fr/monthly_reports.shtml**

Computer Security Team

Computer Security

THIRTY YEARS SINCE "1984" - HOW CLOSE WAS ORWELL TO TODAY'S INTERCONNECTED WORLD?

This year marks the 30th anniversary of the time depicted in the novel *1984*, written by the visionary George Orwell in 1947/8, as well as the 25th anniversary of the World Wide Web being invented at CERN. To mark this occasion, both the Cineglobe Film Festival at CERN and the Latitude Festival in the UK are holding panel discussions on the technological and socio-cultural implications of our infinite connectedness in an age of internet surveillance: "How close is our world to that of Orwell's nightmare?"

The novel *1984* describes the fate of its protagonist Winston Smith and his love interest Julia. The setting is "Oceania", one of three supra-nations at war with one another, a dictatorship blocking all free will (considered to be "thoughtcrime"), altering inconvenient historical truths (using "Newspeak") and permanently monitoring its citizens (the origin of the phrase "Big Brother is watching

you"). Luckily, neither the year 1984 nor 2014 has seen world-spanning dictatorships, although many local dictatorships have appeared and disappeared in nations trying to find their way to democracy. The World Wide Web, Twitter and Facebook have actually helped to overthrow dictatorships, at least in the short term. Orwell was wrong on that one. Thank goodness.

However, what about free will? We might believe that it exists, but aren't the media and the World Wide Web influencing our thoughts, attitudes and opinions more and more? With a flood of information out there, we have to be selective. It is natural to listen to, read and watch what we like and to ignore or suppress what we don't. Our chosen media outlets, RSS feeds, Tweets and Facebook or Google+ group memberships already lead to biases based on our own preferences. For example, you will notice that web advertisements often refer to things you have recently searched for or bought (thanks to Google AdSense).

A recently published psychological study

Official news

ANNUAL INFORMATION MEETING OF THE PENSION FUND

All members and beneficiaries of the Pension Fund are invited to attend the Annual Information Meeting.

**Annual Information Meeting
to be held in the CERN Council Chamber
on Tuesday, 16 September 2014
from 9.30 a.m. to 11.30 a.m.**

Copies of the 2013 Pension Fund Financial Statements are already available in accessible PDF on the Pension Fund website and will also be distributed at this session.

Coffee and croissants will be served prior to the meeting as of 9:00 a.m.
N.B. Nouvelle date : 16 septembre 2014

Training

LANGUAGE COURSES

Cours d'anglais général et professionnel

La prochaine session se déroulera **du 22 septembre au 12 décembre**.

Ces cours s'adressent à toute personne travaillant au CERN ainsi qu'à leur conjoint. Pour vous inscrire et voir tout le détail des cours proposés, consultez nos pages web : <http://cern.ch/Training>.

Oral Expression

The next session will take place from **29 September to 5 December**.

This course is intended for people with a good knowledge of English who want to enhance their speaking skills. There will be an average of 8 participants in a class.

Speaking activities will include discussions, meeting simulations, role plays etc. depending on the needs of the students.

Writing Professional Documents in English – Administrative

Writing Professional Documents in English – Technical

The next session will take place from **29 September to 5 December**.

These courses are designed for people with a good level of spoken English who wish to improve their writing skills. There will be an average of 8 participants in a class.

General & Professional French courses

These courses are aimed for students who have studied French before (CERN level 2 – level 7).

The next General & Professional French course will start **on 6 October**.

New!

French integration courses for real and false beginners

The aim of this course is to give some basic skills to beginners in order to communicate in simple daily life situations in both social and professional life. These courses can start at any time during the year, as soon as a group of beginners has been identified.

Participants can apply either for an intensive course (7.5 weeks with 8 hours of classes per week) or semi-intensive course (10 weeks with 6 hours of classes per week) and choose between different times (morning – lunch time – late afternoon).

Language Tandem

Language exchange is a method of language learning based on mutual practice by learning partners who are not necessarily native speakers. This programme is not limited to the practice of the two official languages and is free of charge.

We have more than 200 members – join now!

For registration and further information on the courses or the language tandem programme, please consult our web pages: <http://hr-training.web.cern.ch/hr-training/> or contact Kerstin Fuhrmeister (70896), (language.training@cern.ch).

Take note

THE PORT: HACKATHON AT CERN | APPLY NOW!

Are you innovative and do you like to share your ideas with other enthusiasts? Would you like to apply your knowledge and skills to humanitarian problems? Are you motivated to work on issues beneficial to society?

Apply for our problem-solving workshop – also known as a hackathon / makeathon – taking place at CERN from 31 October to 2 November. You will work in interdisciplinary teams on topics inspired by other NGOs such as the ICRC, UN Development Programme, UNOSAT and UNITAR.

Example topics are:

- Virtual tower camera for air fields
- The conflict zone humanitarian demarcation certificate
- The \$10 inflatable fridge for field operations
- Wearable sign language interpreter
- Can mobile communication data reveal election fraud?
- Tracking and demarcation system

for dogs in rescue and de-mining operations

The four teams of seven hand-picked innovators will be assembled six weeks ahead of the event to give time for preparation as some hardware might be needed. In this time they can contact 'experts-on-call' from different fields of expertise for support.

The application period just started and is open until 11 August – find out more on our website: www.theport.ch and get ready to change the world. If you want to sign up as an 'expert-on-call' and support the teams with your expertise, please sign up.

This is your chance to have an impact on our future!



“SCIENCE AND PEACE” SYMPOSIUM TO CELEBRATE THE 60TH ANNIVERSARY OF THE FIRST COUNCIL SESSION | 19 SEPTEMBER

Friday, 19 September 2014
In the tent behind the Globe of Science and Innovation

The Convention for the Establishment of a European Organization for Nuclear Research entered into force on 29 September 1954, 60 years ago. This marks CERN's official birthday. The first session of the CERN Council, the governance of CERN, was held in Geneva on 7 and 8 October 1954, just one week later.

The symposium “Science and Peace” is being held to celebrate the 60th anniversary of the first Council session. Speakers from all generations will present highlights from 60 years of the Council and various views from their own perspectives.

Programme

15:00 – 15:10: Welcome address – Agnieszka

Zalewska

15:10 – 15:25: The history of the Council – a brief selection of highlights – Jens Vigen

15:25 – 15:40: The Council as seen by a Member State – Sijbrand De Jong

15:40 – 15:55: The Council as seen by an outreach specialist – Steven Goldfarb

15:55 – 16:10: The Council as seen by a young scientist – Laura Grob

16:10 – 16:25: The Council as seen by a pensioner – Edith Deluermoz

16:25 – 16:40: The Council on the world stage – Jonathan Ellis

16:40 – 16:55: The Council and accelerators, medical applications, technology transfer, and the World Wide Web – Horst Wenninger

16:55 – 17:00: Closing remarks – Rolf Heuer

EXHIBITION | CERN MICRO CLUB | 1-30 SEPTEMBER

The CERN Micro Club (CMC) is organising an exhibition looking back on the origins of the personal computer, also known as the micro-computer, to mark the 60th anniversary of CERN and the club's own 30th anniversary.

**CERN, Building 567,
R-021 and R-029
01.09.2014 - 30.09.2014
from 4.00 to 6.00 p.m.**

The exhibition will be held in the club's premises (Building 567, rooms R-0121 and R-029) and will be open Mondays to Thursdays from 1 to 30 September 2014.

Come and admire, touch and use makes and models that disappeared from the market many years ago, such as Atari, Commodore, Olivetti, DEC, IBM and Apple II and III, all in good working order and installed with applications and games from the period.

Club members will be on hand to tell you about these early computers, which had memories of just of a few kilobytes, whereas those of modern computers can reach several gigabytes or even terabytes.

INTERNAL CONFERENCE IN THE FRAMEWORK OF CERN'S 60TH ANNIVERSARY | 8 SEPTEMBER

08 September 2014
Main Auditorium

3.45 p.m. – 4.00 p.m.: Coffee

4.00 – 5.00 p.m.: Dieter Schlatter - Deep Inelastic Lepton-Nucleon Scattering Experiments at CERN

Abstract

Several deep inelastic scattering experiments using neutrino and muon beams were done at the SPS during the period 1977 to 1985. The experiments, their physics results and the importance of these early tests of the Standard Model will be described.

Biography

Born 1944 in Germany.

1973, PhD in experimental particle physics, Hamburg University.

From 1976, a CERN fellow at the neutrino experiment CDHS.

1980-83, at SLAC, e+e- physics with Mark II at the PEP ring.

1983, back at CERN, e+e- physics with the ALEPH experiment at LEP.

2001-2005, EP Division Leader / PH Dept. Head.

From 2006, worked on the conceptual design of a detector for a future CLIC e+e- collider.

Retired since 2010.

5.00 p.m. – 6.00 p.m.: Hans Specht - Heavy Ion Physics at the CERN SPS: Roots 1974-1984 and Key Results

Abstract

Particle accelerators have been used in fundamental research for over a century, allowing physicists to discover elementary particles and study them at increasingly smaller scales. Making use of emerging technologies whose progress they helped to stimulate, they developed exponentially throughout the 20th century to become major tools for research today, not only in particle physics but also – as powerful radiation sources for probing matter – in atomic and molecular physics, condensed matter physics and materials science. They have also found applications in society, where they are increasingly used in a wide range of fields including applied sciences, medicine (research and clinical applications) and industry. The lecture will cover examples of these applications and further development opportunities.

Biographie

1936 : naissance en Allemagne. Études de physique à l'Université technique de Munich et à l'École polytechnique fédérale de Zurich.

1964 : doctorat à l'Université technique de Munich (H. Meier-Leibnitz).

1965-1968 : Boursier NRC - Postdoc à l'AECL de Chalk River (Canada).

1969-1973 : Habilitation et poste de professeur associé à l'Université LMU à Munich.

1973 : professeur à l'Université de Heidelberg.

Depuis 1983, recherche principalement au CERN.

Membre de R807/808 pour la dernière année d'exploitation des ISR. Membre de

plusieurs expériences sur les ions lourds : NA34/2 (porte-parole), NA45 (porte-parole) et NA60.

Directeur scientifique de GSI Darmstadt de 1992 à 1999. Publications dans les domaines de la physique atomique, de la physique nucléaire, de la physique des hautes énergies et de la recherche sur le cerveau.

Depuis 2000, membre de l'Académie des sciences de Heidelberg.

Depuis 2004, professeur émérite.

CINEGLOBE FILM FESTIVAL PRESENTS PARTICLE FEVER IN CELEBRATION OF CERN'S 60TH ANNIVERSARY | 20 SEPTEMBER

The film *Particle Fever* follows six brilliant scientists during the launch of the Large Hadron Collider, which marked the start-up of the biggest and most expensive experiment in the history of the planet, pushing the boundaries of human innovation.

Seeking to unravel the mysteries of the universe, 10,000 scientists from over 100 countries joined forces in pursuit of a single goal: to recreate the conditions that existed just moments after the Big Bang and find the Higgs boson, potentially explaining the origin of all matter. But our heroes face an even bigger challenge: have we reached the limit of our capacity to understand why we exist?

Directed by Mark Levinson, a physicist turned filmmaker, and masterfully edited by Walter Murch (*Apocalypse Now*, *The English Patient*), *Particle Fever* is a celebration of discovery, revealing the very human stories behind this epic machine.

The film will be followed by a panel discussion with director Mark Levinson, Academy Award-winning editor Walter Murch and some of the physicists featured in the film. The audience will have the chance to put their questions to the panel.

After the panel discussion, join us for a drink and the opportunity to watch some CERN scientists become amateur comedians for one night only! From the quirks of quarks to cultural conundrums, you'll hear all about the lighter side of life in cutting-edge science.

Doors open at 6 p.m.
Film (in English with French subtitles) and panel: 7 - 9.30 p.m.
Comedy (in English): 10 - 11 p.m.

The event will be held in a marquee behind the Globe of Science and Innovation, CERN.

Book your ticket: www.eventbrite.com

CONFÉRENCE | PHILIPPE LEBRUN | « LES ACCÉLÉRATEURS DE PARTICULES » | 2 SEPTEMBRE

« *Les accélérateurs de particules : vecteurs de découvertes, moteurs de développement* », par Dr. Philippe Lebrun.

2 septembre 2014 - 19 h 30
Globe de la science et de l'innovation

Les accélérateurs de particules existent depuis plus d'un siècle comme instruments de recherche fondamentale et ont permis la découverte des particules élémentaires et leur étude à des échelles toujours plus fines. Épousant les technologies émergentes dont ils ont stimulé les progrès, ils se sont

développés de manière exponentielle tout au long du XX^e siècle, pour être aujourd'hui les grands outils de la recherche en physique des particules, mais aussi – comme puissantes sources de rayonnements permettant de sonder la matière – en physique atomique et moléculaire, en physique de la matière condensée et en science des matériaux. Ils ont également trouvé leur place dans la société par leur utilisation croissante pour des applications dans des domaines très divers, des sciences appliquées à la médecine (recherche et applications cliniques) et à l'industrie. L'exposé présentera des exemples de telles applications et les voies de leurs développements.

Philippe Lebrun travaille au CERN sur les grands accélérateurs de particules. Il a dirigé la division Technologies des accélérateurs

du CERN pendant la construction du Grand collisionneur de hadrons (LHC). Diplômé de l'École des mines (Paris) et du California Institute of Technology (Pasadena), il est auditeur de l'Institut des hautes études pour la science et la technologie (Paris), et docteur *honoris causa* de l'Université de technologie de Wrocław (Pologne).

La conférence sera donnée en français et sera traduite en anglais.

Entrée gratuite. Nombre de places limité.

Réservation indispensable au +41 22 767 76 76 ou cern.reception@cern.ch.

La conférence sera retransmise sur : www.cern.ch/webcast.

Cette conférence est organisée dans le cadre des 60 ans du CERN : www.cern.ch/cern60.

Seminars

SUNDAY AUGUST 31, 2014

- 08:00 CAS - CERN Accelerator School Introduction to Accelerator Physics 2014 Hotel Don Giovanni

MONDAY SEPTEMBER 01, 2014

- 08:30 Induction Sessions INDUCTION PROGRAMME - 1st Part 80-1-001

TUESDAY SEPTEMBER 02, 2014

- 11:00 EP Seminar Top quark mass measurements: how precise does it get? Council Chamber

- 16:30 CERN Colloquium From John Bell at CERN to Quantum Communication and Quantum Computation. Main Auditorium
- 19:30 Globe Les accélérateurs de particules : vecteurs de découvertes, moteurs de développement. 80-1-001

WEDNESDAY SEPTEMBER 03, 2014

- 11:30 TH Cosmo Coffee dS/CFT and prospects on cosmology TH common room

THURSDAY SEPTEMBER 04, 2014

- 11:00 Collider Cross Talk Test of lepton universality using $B^+ \rightarrow K^+ \ell^+ \ell^-$ at LHCb TH common room Sunday September 07, 2014
- 17:00 Miscellaneous Italian Teachers Program 2014

TUESDAY SEPTEMBER 09, 2014

- 14:00 TH String Theory Seminar Simplifying Amplitudes in $N=4$ Supergravities TH Conference Room