

## VERSATILE BY DESIGN

**CHARM (CERN High energy AcceleraTOR Mixed field) is a new and unique testing facility that will complete CERN's radiation testing installations. Located in the East Area, CHARM will provide teams with a venue to test their equipment in radiation environments similar to those found in the accelerator chain.**



Team at work in the irradiation zone of the CHARM facility.

First envisaged in 2007, the CHARM facility fulfils a growing demand for a large-scale tailor-made radiation testing facility. Unlike commercial facilities, CHARM features a wide spectrum of radiation types and energies (called mixed-field radiation environments), the space to test large equipment and even the possibility to adjust the environment using mobile shielding. "CHARM is versatile by design, allowing us to recreate any of the radiation environments found in the accelerator chain," says Markus Brugger, head of the R2E (Radiation to Electronics) project team that developed the CHARM facility. "We create our radiation in the same way it occurs in the accelerator complex: by colliding a beam against a fixed target (copper, aluminium or an aluminium sieve, depending on the required intensity). CHARM also has the space to test equipment as large

as two cubic-metres and as heavy as one tonne, along with all the precise monitoring equipment that goes with it."

CHARM is located in the East Area just downstream of the PH Department's IRRAD facility, where high-flux radiation testing on smaller experimental equipment takes place. CHARM's installation unites CERN's experimental and accelerator equipment testing in a single area. "We will use the same beam as the upstream IRRAD facility, as the vast majority of the beam goes straight through their samples," says Brugger. "CHARM will exploit these beams, which would otherwise have been dumped."

"LS1 was the perfect opportunity to set up the CHARM facility," says Julien Mekki, who leads the CHARM facility team. "On top of their

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### A word from the DG

#### CELEBRATING SCIENCE FOR PEACE

These last two weeks have underlined the significance of our 60th anniversary slogan: science for peace.

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# A word from the DG

## CELEBRATING SCIENCE FOR PEACE

The second Wilton Park event on science and religion that we've participated in took place in Divonne, bringing representatives of the world's major religions together to discuss the potential for dialogue. It was a clear example of science facilitating conversations that might otherwise never have happened, and the report on the event should be well worth reading when it comes out later this year. We also saw the start of the International Conference on High Energy Physics, ICHEP, in Valencia, bringing physicists from around the world together. But what I want to focus on is the ceremony at UNESCO in Paris on 1 July marking the 61st anniversary of the CERN Convention.

It was at UNESCO in Paris on 1 July 1953 that the CERN Convention first saw the light of day. That historic occasion marked a turning point in European scientific history that would have ramifications for the way science is done globally. Thanks to the energy of a handful of visionary pioneers,

channelled through the auspices of UNESCO, a new paradigm for scientific collaboration across borders was born. The CERN Convention is a document remarkable for its brevity and vision. It laid out a charge for the fledgling Organization to create a centre of excellence for European science to rebuild after the wars, while at the same time providing a place where peoples from around the world could come together to work peacefully at the frontiers of knowledge. It did so under a governance structure that has stood the test of time; a structure that works on a consensual model in which each Member State has a voice, and in which everyone is pulling in the same direction.

Scientific excellence and international collaboration have guided CERN from the start. From 12 Member States, we have grown to 21. And from a handful of researchers and diplomats whose vision we embody today, our community has grown to over 10,000, representing about 100 nationalities. CERN's missions also

encompass education and innovation, and I'd like to conclude with a few words on the vital importance of education, particularly in the STEM subjects of science, technology, engineering and mathematics.

We hear much today of sustainable development, and when you think about it, that's a very scientific concept. It's no exaggeration to say that our children's future depends on it, and if we are to deliver sustainable development, then science has to engage more strongly with upcoming generations than it has in recent years. We need a more scientifically engaged population, and the way to get there is through STEM. We set great store by all our missions, but in a year when we're celebrating sixty years of science for peace, and a week which we're celebrating the anniversary of a great joint undertaking of CERN and UNESCO, it seems apt to focus on the E of UNESCO: the key to a sustainable future.

Rolf Heuer

## VERSATILE BY DESIGN

already heavy LS1 workload, CERN teams were able to remove the DIRAC experiment and still had time to construct a whole new facility." Although CHARM reuses an existing site, its construction has been a major undertaking, with over 2,000 tonnes of iron and 4,000 tonnes of concrete installed as shielding and a new control room that will also act as a secondary dry run testing facility. This is part of the East Area renovation, headed by project leader Lau Gatignon and technical activities coordinator Michael Lazzaroni. Together they have tackled numerous technical challenges and coordinated all renovation activities to ensure their completion.

While the challenging construction is being finalised, the CHARM team has been training in a dedicated and newly created mock-up of the facility, where they are successfully commissioning all the equipment that will be installed in CHARM.

In order to minimise radiation exposure, equipment being tested must be installed in CHARM's irradiated area without human intervention. It is the engineer's version of a locked-room mystery: how does a delicate one-tonne piece of equipment, with its

complex cabling, make its way into an irradiated area without any human help? "With the help of many CERN groups and external companies, we were able to develop a set-up that allows us to carry out this feat," says Mekki. "Building on the experience of the CERN handling engineering group, we will use a custom-made, semi-remote lifting and transport vehicle to drive the heavy equipment around tight corridors and into the irradiated area. Cables will be attached to a rail on the ceiling that follows the same track. Once in the irradiated area, the test team will be able to use these cables through a patch-panel connecting the equipment to the user's control and acquisition system."

CHARM will begin testing with beams this September. "This is thanks to the huge effort of many CERN service and equipment groups, who during the critical LS1 period found a way to support this vital project efficiently and often brought unique technical solutions – our many thanks to all of them!" says Brugger. "Now our first high-priority test subjects will be the new main LHC power converter control units, which will be installed next year. After that, we'll be tackling the equipment on our growing waiting list."



View of CHARM's beam-line (with shielding) and the control/technical rooms (right).

Katarina Anthony

(Continued from page 1)

### A very accurate simulator

Different areas of the accelerator complex bring with them different types of radiation and different types of damage. In the early stages of the LHC, the primary concern was single events: failures caused by a single interaction that, in certain cases, can lead to the destruction of the electronic device. This damage varies depending on its location in the LHC tunnel, where there are two primary types of radiation environments: one in the tunnel itself, with particles of very high energies, and another in adjacent shielded areas, where the energy spectrum is dominated by neutrons. With its movable shielding, CHARM can simulate all these environments very accurately.

However, in the LHC injector chain, the priority shifts from single-event failures to cumulative damage affecting the lifetime of the equipment. Cryogenic machines like the LHC have, on average, lower radiation levels than the traditional accelerators in the injector chain. The overall higher levels in the injector chain lead to more severe long-term damage constraints for the exposed equipment. CHARM's radiation spectrum can also be adjusted to reflect this more intense environment.

## LS1 REPORT: A COLD, COLD SUMMER

The cooling of the LHC is advancing quickly, with the second sector having now reached 200 K (about -73°C). By the end of the summer, four of the sectors will have been cooled. To achieve this, trucks carrying around 20 tonnes of nitrogen each are clocking up the miles to bring the cryogenic liquid to CERN. When the whole process is complete, almost four times the mass of the Eiffel Tower will have been cooled, using more than 10,000 tonnes of nitrogen and 140 tonnes of helium.



Liquid nitrogen, arriving to CERN on trucks, is injected into exchangers that pre-cool the helium flow used to cool the magnets.

Cooling a sector (about 3 kilometres long) of the LHC is a fairly complex operation involving several stages. This summer, for the first time, the first two sectors will be cooled to 20 K (and not directly to the nominal temperature of 1.9 K) and will be maintained at this

temperature for two weeks. "This plateau is necessary to allow the teams to carry out checks on the joints that have been repaired during LS1," explains Gérard Ferlin of the TE Department, who is in charge of cryogenics operations at the LHC.

Cooling to 20 K is achieved in two stages. The first consists of lowering the temperature to 80 K by cooling helium using nitrogen. "Every day for the first 10 days, we receive five to six truckloads of nitrogen from the Lyon area," explains Gérard. "This represents about 110 tonnes of nitrogen per day for a total of around 1200 tonnes per sector. The trucks arrive at CERN from 6 a.m. to 10 p.m. The liquid nitrogen is then injected into exchangers that pre-cool the helium flow used to cool the magnets."

After this first stage, to lower the temperature of the helium from 80 K down to the 20 K plateau (and later the final 1.9 K), the operators use the refrigerators present in each sector of the LHC, which cool the helium using turbo-expanders.

At the end of the first LHC run, the helium inventory totalled 140 tonnes. CERN has only a limited capacity for storing helium, so the precious molecules were temporarily sent back to the suppliers. Now they are coming back to CERN. "Now that our refrigerators are operational again, we can store liquid helium in our tanks until it is time to reinject it into the accelerator," confirms Laurent Taviani, head of the Cryogenics Group in the TE Department. "Planning the restart has been a real challenge: in August and September, we will have five to six sectors being filled at once, which would have been impossible without the new tanks installed in 2009."



Despite the tight schedule, the operators are always keeping a close eye on safety: “We have very strict procedures to ensure that people working in the tunnel and on the installations are completely safe,” explains Laurent. “We have a checklist of all the systems related to safety. Cooling is only given a green light when the configuration of all the systems has been validated by the various people in charge.”

The final figures relating to the cooling of the machine are impressive: the 27 kilometres of

the LHC consist of more than 36,000 tonnes of equipment, about four times the mass of the Eiffel Tower. To cool this enormous mass, we will have used more than 10,000 tonnes of nitrogen and 140 tonnes of helium. According to the current schedule, all eight sectors of the LHC will be cooled to 1.9 K by October 2014.

*Antonella Del Rosso*

#### Meanwhile, elsewhere in the LHC...

Teams are carrying out their final tests prior to cool-down in Sectors 1-2, 2-3 and 5-6. Leak tests are being performed on the vacuum sub-sectors of Sectors 3-4 and 4-5, and pressure tests are underway in Sector 7-8. Following last month's cool-down of Sector 6-7, the first CSCM (Copper Stabilizer Continuity Measurement) tests are being conducted.

## SPS COMPLETES LS1 ACTIVITIES

**On 27 June, the SPS closed its doors to the LS1 engineers, bringing to an end almost 17 months of activities. The machine now enters the hardware-testing phase in preparation for an October restart.**



Photo 1: The SPS transfer tunnel, TT10, reinforced with steel beams.

Having completed their LS1 activities right on schedule (to the day!), the SPS team is now preparing the machine for its restart. Over the next eight weeks, hardware tests of the SPS dipole and quadrupole power converters will be underway, led by the TE-EPC (Electrical Power Converters) team. “OP start-up test activities will also be running in parallel, utilising the off hours when EPC is not using the machine,” says David McFarlane, the SPS technical coordinator from the Engineering Department. “The primary beam testing phase will start at the beginning of September, once hardware tests and DSO safety tests have been completed.”



Photo 2: One of the water reservoirs used during LS1 activities.

It has been a long journey to this point, with several major interventions carried out across the accelerator involving teams from all of CERN's departments. Among these many interventions was the complete re-cabling of long straight section 1 (LSS1). “LSS1 is the injection point from the PS and also houses the beam dump. All the cables in the LSS1 region were damaged by radiation and needed to be completely replaced,” explains McFarlane. “In order to reduce the dose for our teams and to improve accessibility, we removed all the machine elements while the work was underway. This cabling work alone took 22 weeks and was then followed by the complete installation of the machine.”

Unexpected civil-engineering work was also carried out in the TT10 transfer tunnel, which links the PS to the SPS. In early 2013, surveyors noted that the tunnel's age had started to catch up with it, resulting in cracks and other structural issues. Support beams (see photo 1) were installed at critical points along the length of TT10 - work that required most of the beam line to be removed! Monitoring devices were also installed, ensuring that future issues are noticed well in advance.

Meanwhile, above ground, the high-voltage electrical cables between the SPS points have been completely replaced. “We were able to do most of this work in the years prior to LS1 by laying the new 18 kV cables without connecting them,” says McFarlane. “During LS1, we upgraded the machine's transformers and then linked these new cables for the first time.”

The SPS's primary water valves were also replaced during LS1, which required the injector's water supply to be fully drained. “As well as losing the main water supply for the magnets, this also drained the water supply for the fire-fighting system,” says McFarlane. “So while this work were ongoing, massive external water reservoirs (see photo 2) were placed at each point. Had there been an incident, the Fire Brigade would have used these as their supply.”

With all this work now complete, the SPS team is now shifting their focus back to operation with beam. At the end of August, the machine will officially be handed back to the Operations group.

*Katarina Anthony*

## FIRST LINAC4 DTL & CCDTL CAVITIES INSTALLED IN TUNNEL

**On 5 June, the first Drift Tube Linac (DTL) was successfully transported to its forever home in the Linac4 tunnel. Similarly, the first Cell-Coupled Drift Tube Linac (CCDTL) was installed on 6 June. These moves marked the end of years of design and manufacturing by Linac4 teams.**

Although it may seem like a relatively routine transport operation, the DTL's move was a landmark event for the entire Linac4 collaboration. “Along with the first four Cell-Coupled DTL modules, which were installed on the following two working days, these are the first accelerating structures after front-end commissioning to be installed in the tunnel,” says Frank Gerigk, who is responsible for all Linac4 accelerating structures. “It is a major milestone, because work on all these structures started well over a decade ago.”

The transport operation was also quite a victory for the Linac4 DTL team, whose

journey to a complete DTL structure has been a bit of a wild ride. “After many years designing and constructing these one-of-a-kind accelerating structures, we are extremely happy to have finished the assembly and testing of this first tank,” says Suitbert Ramberger, project engineer for the Linac4 DTL. “Of course, we aren't quite done yet! We look forward to finishing and installing the other two DTL tanks in the coming months.”

The CCDTL modules have also had a long journey to completion, as the first CCDTL modules arrived at CERN from Siberia in September 2012. The remaining five modules

were delivered and assembled by a mixed Russia-CERN team in 2013. “Having finally seen these accelerating cavities in place in the tunnel, we are all very much looking forward to the first beam they will accelerate,” says Maurizio Vretenar, the Linac4 project leader.

Check out the video below to see the first DTL being transported into the Linac4 tunnel:



*Katarina Anthony*

## HIGHLIGHTS FROM E-EPS: COORDINATED ACCESS TO LIGHT SOURCES

**The CALIPSO project, which runs until May 2015, will contribute to the effective exploitation of European synchrotrons and free electron lasers. CALIPSO (Coordinated Access to Light sources to Promote Standards and Optimisation) includes 20 partners forming one of the largest Research Networks in the world.**

e-EPS interviewed M. Bertolo, CALIPSO project manager and his assistant C. Blasetti.

#### Which challenges are addressed by CALIPSO?

CALIPSO's goal is to optimize the exploitation of the European synchrotrons and Free Electron Lasers. With respect to previous projects funded by the European Commission, it foresees significant improvements in integration, innovation and user-friendliness in all three areas of networking, transnational access and instrumentation.

The Transnational Access program potentially benefits a community of 25,000 estimated users offering free open access to 12 synchrotrons and 5 free electron lasers solely based on scientific merit.

In addition to this impressive program, CALIPSO moves a step forward towards integration.

One of its core activities is the development of the online portal wayforlight.eu to guide potential users from general knowledge of the applications to specific information about techniques and instrumentation, up to submission of a successful proposal for Transnational Access.

Excellence is also supported through the HIZPAD2 Joint Research Activity, in which facilities cooperate to develop new generations of pixel array detectors.

#### What are the main achievements so far?

In the first half of the project, more than 1,300 users were supported corresponding to more than 580 projects, producing hundreds of peer reviewed publications.

The wayforlight portal was first setup to present all facilities in a homogeneous way – subsequently, standardized datasheets have been designed, filled and finally published for

more than 270 European beamlines. Thanks to this innovative tool, users will be able to find the best beamline for each experiment by using interactive filters at multiple levels.

#### How is industry involved in the project?

The European Light Sources for Industrial Innovation (ELSII) networking activity is dedicated to catalyse the industrial use of and interaction with European light sources. It deals with industry as a facility user and is organized around 2 tasks: the creation and involvement of an Industrial Advisory Board and the Promotion of Light Sources for Industrial R&D at partner facilities. ELSII started in November 2012 and has organized 3 workshops that have industry targeted and setup an Industrial Advisory Board jointly with the Integrated Infrastructure Initiative for Neutron Scattering and Muon Spectroscopy (NMI3) project.

#### Which objectives would you like to achieve by the end of the project?

By the end of the project, another 1,000 users will have been supported, more than originally planned. We will work towards dissemination of wayforlight contents



taking into account users' feedback, and plan sustainability of the portal after the end of the project.

We expect the first actions of facilities following the recommendation of the Industrial Advisory Board and a roadmap will be prepared to increase industry awareness about the potential of synchrotron radiation.

From the Instrumentation development side, innovative pixel array detector prototypes will be completed and extensively tested by researchers at partner facilities.

ESUO will work towards strengthening of the whole European as well as of national user communities, and expects to create specialized user groups to deal with different scientific areas.

e-EPS News



CALIPSO partner facilities

## Behind the scenes of GS

### BEHIND THE SCENES OF GS: AN EYE FOR ACCURACY

**The CERN sites are constantly evolving... with new buildings, extensions, redevelopment and renovation. The team in charge of geographical information in the GS Department measures and records even the smallest changes so that it can provide everyone at CERN with the most up-to-date plans possible.**

The "Patrimony" team in the GS-SE-DOP Section is responsible for geographical information and has the job of updating all of the information relating to CERN's property, including the land made available to the Organization by Switzerland (110 hectares) and France (516 hectares), green spaces, buildings, underground structures, underground networks (gas, water, electricity, etc. – for which the "Patrimony" team works closely with numerous other groups and departments), car parks, roads... and much more.

"Our team consists of seven surveyors and GIS specialists, who identify, define, measure, catalogue and pinpoint the location of every item of CERN's property, buildings or otherwise, on the surface or underground," explains Youri Robert, head of the "Patrimony" team. "All of this information is integrated daily into our Geographic Information System (GIS) portal."

For example, for a new construction, the surveyors are involved in several stages of the project: before work starts, they make a survey of the land as a basis for the project; when work starts, they plot the footprint of the construction; and finally, after work is completed, they carry out final measurements of the new buildings, roads and networks and create floor plans. "To take measurements of the exterior of buildings, of roads, of green spaces, etc., we use a total station and a GPS device," explains Samuel Zeler, a survey technician. "The GPS device allows measurements to a precision of 1 cm, which ensures that we can perform very high-quality surveys."

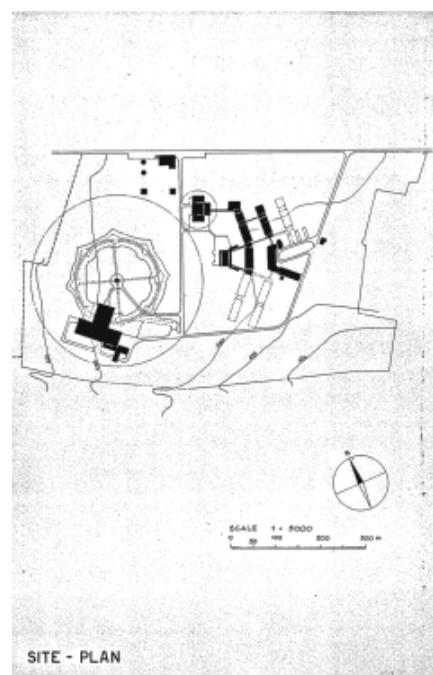
"To map internal structures (offices, underground areas, etc.) we use a distance meter (an electronic distance measuring

device)," adds Hansjuergen Knoop, who is also a survey technician. "We are constantly updating nearly 1300 floor plans, which are available to everyone at CERN through the GIS portal." Soon, 400 plans of CERN's underground installations (accelerator tunnels, experiment caverns, access tunnels, etc.) will be added to the portal, as LS1 has given the "Patrimony" team the opportunity to get underground and complete its catalogue.

"Keeping the catalogue up-to-date is a long-term job," emphasises Youri Robert, "but it's essential for keeping people and equipment safe. In fact, our plans are the basis for the evacuation plans drawn up by the safety services (HSE) and the Fire Brigade also relies on them in the event of an emergency." In terms of CERN's facilities, the "Patrimony" team processes almost 400 declarations of intent to start work (*Déclaration de commencement de travaux* - DICT) for the non-fenced areas of the CERN site in France each year and must, in some cases, follow the work very carefully to ensure that none of CERN's underground networks are damaged. Here too, knowing the exact location of these networks is essential.

To help everyone at CERN in their work, the "Patrimony" team has also made its SIG platform available. This allows users to map facilities relating to their own areas of expertise. Each specialist can integrate and share his or her own information on a regularly updated common plan. This means that it's possible to search for and find, in the blink of an eye, the location of fire extinguishers, electrical feed boxes, access systems and radiation monitors... and even most of the components of the accelerators!

Anaïs Schaeffer



The first map of the CERN (Meyrin) site, 1954.

## Computer Security

### DON'T COPY/PASTE PASSWORDS!

**What do umbrellas, hair, wars and passwords have in common? Over time, they all get lost.**

While some losses are inevitable, we can at least help you reduce the impact. Millions of passwords are stolen or lost every year. Partly because of inattentive users falling for "Phishing" traps, where adversaries simply ask people for their passwords; partly due to compromised web sites having their database of passwords stolen.

For example, over the past few years, eBay recently asked their 145 million users to change their passwords, LinkedIn lost 6.5 million hashed\* passwords, and the hacking of the CERN HyperNews service rendered 4745 password hashes public. Just recently, 860,000 usernames, e-mail addresses and hashed passwords were stolen from the MacRumors forum, and Adobe lost a record 150 million e-mail/password combinations. So far, not good. At CERN, 746 people were notified when their CERN e-mail address was found among these combinations. Indeed, it was likely that some people used a similar password for their CERN account, as some password hints exposed suggested this: "cern id", "nice pw dec 2011" and "wie edh" but also "us the year of LHC startup".

So take up this small challenge. We are creative people! Good security practitioners use complex passwords and different passwords for different sites. A good password must be private (used and known by only one person); secret (it must not appear in clear text in any file or program, or on a piece of paper pinned to the monitor); easily remembered (so there is no need to write it down); at least 8 characters long with a mixture of at least three of the following: upper case letters, lower case letters, digits and symbols. It must not be listed in a dictionary of any major language and it cannot be guessable

by any programme in a reasonable time, for instance, less than one week.

A good password is a work of art. Here are some hints to help you choose good passwords:

- Choose a line or two from a song or poem, and use the first letter of each word. For example, "In Xanadu did Kubla Kahn a stately pleasure dome decree!" becomes "IXdKKaspdd!". Mathematical formulas would also do: " $a^{**2} + \text{sqrt}(b) = c^{^2}$ ".
- Use a long passphrase like the sentence "I nXanaduDidKublaKahnAStatelyPleasure DomeDecree!" itself.
- Alternate between one consonant and one or two vowels with mixed upper/lower case. This provides nonsense words that are usually pronounceable, and thus easily remembered. For example: "Weze-Xupe" or "DediNida3".
- Choose two short words (or a big one that you split) and join them together with one or more punctuation marks. For example: "dogs+F18" or "comP!!UTer".

Remember that your password is your "toothbrush" - a toothbrush you do not share and which you change regularly. Neither your colleagues, your supervisor, the ServiceDesk or the Computer Security Team have any valid reason to ask for it. They should not and will never do so. The same is valid for any external company: UBS, Paypal, Amazon, Facebook or Google will never ask you for your password! Your password is yours and yours alone.

If you still struggle to recall all your passwords, use one of these fine password vaults: KeePass or Password Safe (but note that usage is at your own risk - neither the CERN Security

Team nor the IT department support these tools). However, refrain from using the password cache offered by your browser, e.g. Chrome, Firefox, or Internet Explorer, as passwords are not always stored in a secure manner (more on this in our Bulletin article "Don't let Chrome expose your passwords"). In particular if you lose your device, you might also give away the access to your favourite web sites! Another good reason to re-type your password, especially on smart phones, is that a hardcoded password might end up in your devices' back-up - stored somewhere in the cloud.

Check out our website for further information, answers to your questions and help, or e-mail [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch).

If you want to learn more about computer security incidents and issues at CERN, just follow our **Monthly Report**.

*\*"Hashes" are results of a mathematical one-way functions like MD5 or SHA. Calculating a "hash" of a password is easy; but the inverse is supposed to be difficult. Once you login, the hash value is calculated from your password and compared to what is stored with the web service you intend to use. However, if an attacker gets hold of this list of hashes, they can use so-called "rainbow tables", i.e. pre-calculated hashes for a wide variety of passwords produced from common dictionaries, and hope that one entry of those pre-calculated hashes matches those in the stolen list of hashes. As a counter measure, random data is now added to hashes as "salt", so that the size of a rainbow table grows exponentially.*

Computer Security Team



### AMENDMENTS TO THE RULES OF THE CERN HEALTH INSURANCE SCHEME (CHIS) - EDITION 1 JANUARY 2012

Following recommendations made by the Internal Audit Service concerning, inter alia, the need to clarify the governance of the CHIS, amendments were approved by the Director-General following examination at the Standing Concertation Committee meeting on 10 April 2014.

The new rules entered into force on 1 June 2014 and are available on the intranet site of the CHIS: <http://cern.ch/chis/doc/Rules2014F.pdf>

The new rules provide for the involvement of three entities in the governance of the CHIS: an Administrator, a Strategic Advisor and a joint body (the CHIS Board), all appointed by

the Director-General. The CHIS Board will be composed of four members appointed by the Director-General, including the Administrator, and four members appointed by the Staff Association. The Strategic Advisor will preside over the CHIS Board.

Department Head Office  
HR Department

### YVES BERNARD (1954-2014)

Yves Bernard, who has passed away at the age of 59, worked in the transport and handling service (EN-HE) and had been at CERN since 1 July 1975.

He initially worked for the various transport companies on site, such as H. Reigner, ISS, DBS and ALTEAD, during which time he quickly climbed the ladder (from driver to team leader to foreman) before becoming a member of the CERN personnel in 2004. He was also a volunteer firefighter at the Grilly-Divonne fire station.

He worked on all the large accelerator and experiment worksites, in particular on the installation of DELPHI and the North Area (UA1, UA2, UA5), on the Meyrin site (ISR, ISOLDE, AD, the CTF3 complex, n\_TOF, LINAC4) and on consolidation work (PS, East Area, PSB). Always friendly and open, he was well-known by many people all over CERN. If ever you had a transport problem, he was the man to call. His commitment to the Organization meant he always went the extra mile to help out physicists and users. He was proud to work at CERN and the technical coordinators were able to count on him.

Throughout his career he became known and loved by many people at CERN.

His friends and colleagues



Yves Bernard CERN Open Day 2008

We deeply regret to announce the death of Yves Bernard on 21 June 2014. Yves Bernard, who was born on 16 October 1954, worked in the EN Department and had been at CERN since 1 July 1975.

The Director-General has sent a message of condolence to his family on behalf of the CERN personnel.

Social Affairs  
Human Resources Department

### THE INDIVIDUAL BREAKDOWN OF PENSION RIGHTS

The individual breakdown of pension rights will be notified by e-mail at the end of September 2014.

Pension Fund Department

### RESPECT @ CERN

Since 2010 CERN has been a member of the Geneva-based association "Le respect, ça change la vie". Four years later and in conjunction with CERN's celebration of its 60 years of 'science for peace', it is time to launch a new respectful workplace awareness campaign under the auspices of the Ombud.

Mutual respect is a basic pillar of peace. At CERN, we pride ourselves on our history, which started when a handful of Europe's visionary scientists saw the opportunity that an international laboratory for fundamental research would present in bringing nations together. That idea has worked very well and, today, our success can be measured not only in terms of unprecedented scientific achievements but also in terms of training and education, and exemplary collaboration across borders, cultures and an extensive range of differences.

In order for history to continue along these positive lines, and coming back to the awareness campaign we are launching with this article, it is important to underline the fact that mutual respect needs to be constantly fertilized in our everyday life. In other words, it is important to be proactive and to be continually attentive to making sure that we maintain this spirit of respect, in the first

place towards each other as colleagues, but also notionally, by ensuring that we extend the same respect towards other professions, across all levels and hierarchical roles, keeping in mind that everyone has a part to play in this ambitious adventure that is CERN. In addition to that, it is also important to extend that respect to our workplace, the rules that provide us with the framework within which we work, together with the equipment and the infrastructure we use, and which belongs to us all.

In this context and four years after it was used for the first time, it has been decided to renew our commitment to the "Respect changes your life" initiative. Working in collaboration with colleagues in the fields of diversity, communication, health and safety, we are now launching a new awareness campaign that will include the CERN-Respect joint logo, and various actions such as specially branded items to be on sale at the shop, an event to

be organised toward the end of the year, and awareness raising posters to be distributed in various places at CERN, as appropriate.

We want these initiatives to belong to you. For this reason, we would like to ask you to propose the messages you would like to see included in the posters. What does a "respectful workplace" mean for you? Send your suggestions to [respect@cern.ch](mailto:respect@cern.ch) - and of course we will reward the authors with exclusively designed and Respect@CERN-branded items. So, whether it's respect in relation to interpersonal interactions, noise, safety, the environment or anything else, we look forward to receiving your ideas. Do not hesitate - send that email now!

Sudeshna Datta-Cockerill



The CERN-Respect joint logo

## Training

### SAFETY TRAINING: PLACES AVAILABLE IN JULY AND AUGUST

There are places available in the forthcoming Safety courses. For updates and registrations, please refer to the Safety Training Catalogue:





## Take note

### THE SUMMER STUDENT WEBFEST IS BACK AT CERN!

The CERN Summer Student Webfest is an annual hackathon at CERN, in which a group of bright and creative minds meet over a weekend to build cool science projects using Open Web technologies. It's happening soon. Be there!

At the previous two Webfests, participants built applications ranging from 3D games about particle physics to cheap mobile-phone-enabled cosmic ray detectors. And yes, they built them, or at least working prototypes, over just one weekend!

Participants in the Webfest work in small teams, each on specific ideas, to design neat Web applications that encourage the public to learn more about science and in particular about CERN, the LHC and physics. This year, we're also encouraging summer students to explore humanitarian projects that involve Web-based solutions, together with CERN's partner UNOSAT.

If you have a great idea for a project, or you want to team up with other students and use or further develop your Web skills, this is your opportunity to spend a weekend being creative and social, with a bunch of passionate fellow students, as well as some Web developers and scientists from CERN and the Mozilla Foundation.

Post your ideas and proposals online on our website, and get in touch with other like-minded students who may want to help you out with the project. Discuss. Deliberate. Make it happen. And if you are CERN staff or a visitor, you can come along to watch and contribute as a mentor or helper too. It all happens in and around Restaurant 1.

Oh! Did we forget to mention? There are free meal vouchers for all participants, and prizes will be awarded to the best projects, with a Grand Prize winner receiving a trip to the Mozilla Festival in London.

**Dates: 1-3 August (afternoon pitching session on the 1st).**

More information and sign-up at: <https://webfest.web.cern.ch>

Sharada Mohanty

### RESTAURANT CLOSURES: SUMMER 2014

#### Restaurant 2

- Table service/brasserie: closed from Monday 28 July to Friday 12 September (open upon reservation for groups of 20+)

#### Snack bars

- Bldg. 54: closed from Monday 7 July to Friday 12 September (self-service Nespresso machine available)
- Bldg. 40: closed every day at 4.30 p.m. instead of 5 p.m. from Monday 07 July to Friday 12 September

#### Jeûne Genevois :

- Restaurant 2, Restaurant 3, Bldg. 6, Bldg. 13, Bldg. 30 and Bldg. 54 will all be closed 11 and 12 September 2014
- Bldg. 40 and Restaurant 1 will remain open

### THE MAKING OF THE 2013 OPEN DAYS... OUT NOW!

As promised, a 45-minute DVD entitled "The Making of the 2013 Open Days" has finally arrived!

Relive your unforgettable memories and watch all the highlights of the Open Days: see the joy and fascination on the faces of the visitors, rock to the sounds of the Bosons and More concert, meet the organising team (the Core Team) and look out for yourself among all the volunteers!

Just like at the World Cup, this video captures the passion that unites the crowds and motivates the teams at huge events. People from all over CERN were involved in making this huge adventure happen and the video is an opportunity for us to thank you all once again for your participation, goodwill and good humour.

The DVD will be distributed to all Open Days 2013 volunteers by internal mail from Monday 7 July. Due to the large number of volunteers, distribution will take two to three weeks. Thank you in advance for your patience!

Virginie Blondeau, on behalf of the Core Team

### THE SOCIOLOGY OF BIG SCIENCE PUBLIC LECTURE BY ULRIKE FELT 15 JULY

**"The sociology of big science"**  
Public Lecture by Prof. Ulrike Felt  
Tuesday 15 July 2014 - 7.30 p.m.  
Globe of Science and Innovation

Lecture in English, translated in French.  
Entrance free. Limited number of seats.  
Reservation essential: +41 22 767 76 76 or [cern.reception@cern.ch](mailto:cern.reception@cern.ch)

#### What science for what kind of society? Reflecting the development of big science

Without any doubt, CERN can be described as being among the most ambitious scientific enterprises ever undertaken. For 60 years, the Member States have not only invested considerable financial means into this institution, but have also supported the creation of a highly visionary research programme. And this has led to a change in the way science is done, as captured by the idea of "big science".

Yet this naturally also raises a number of quite fundamental questions: How did the meaning of "doing science" change? What justifies societal engagement with and support for such a cost-intensive long-term scientific undertaking? And finally, in what ways does (and did) this research enterprise contribute to the development of contemporary societies?

By focusing on some key examples, the talk will thus explore how the ways of doing research and how scientific and societal relations have undergone change over the history of CERN. This will allow an understanding of the many ways in which the development of research and contemporary societies are intertwined.

### AT THE FRONTIER OF ASTROPHYSICS AND PHILOSOPHY | PUBLIC CONFERENCE BY HUBERT REEVES | 16 JULY

**"At the frontier of astrophysics and philosophy: between infinitely large and infinitely small"**  
Public conference by Hubert Reeves  
Globe of Science and Innovation  
Wednesday 16 July 2014 - 7.00 p.m.  
Please note that this conference will be in French only.

*"The Universe is changing. We are not strangers in the Universe: recent discoveries in astrophysics prove our intimate bond with everything shining in the sky."*

Save the date! On Wednesday 16 July 2014, Hubert Reeves, astrophysicist, philosopher and engaging communicator, is back at the Globe of Science and Innovation to talk about the frontiers of physics, astronomy and philosophy, two years after the discovery of the Higgs boson at CERN. If you ever wondered how this discovery has changed our knowledge of the Universe and strengthened the bond between the infinitely large world of astrophysics and the infinitely small world of quantum physics, this event is for you.

The conference is part of POPSCIENCE, a project organised by CERN in partnership with Subway Edizioni, the Origins Association, the World Academy of Poetry, the University of Geneva and FNAC, for European Researchers' Night 2014. Reeves will be one of the tutors initiating a group of European poets in the latest in physics and astrophysics. France Info journalist Marie-Odile Monchicourt and physicist Michel Spiro (former President of the CERN Council) will also talk to the poets about Theatre at the frontier between Art and Science at 5.45 p.m., followed by Italian poet Davide Rondoni talking about Poetry and Science at 6.10 p.m.

**The event is open to the public and local press from 5.30 p.m.**

**Entrance is free, but registration is mandatory:**  
<http://www.amando.com/JYCBYAA.html?page=1143922>

## BLOOD DONATION

**22 & 23 July 2014 from 9.00 to 16.00**  
CERN, Restaurant n°2 (bât 504)

After the donation : snack offered by NOVAE and the HUG

[www.dondusang.ch](http://www.dondusang.ch)  
GIVE BLOOD - ONE DAY YOUR LIFE MIGHT DEPEND ON IT

HUG  
Hôpitaux Universitaires de Genève

*The*  
**PHYSICS OF MUSIC**  
*of physics*

Montreux | 12 July | 17:00

(Donald Sinta Quartet performing an original piece by Roger Zare called "LHC", synchronized to the discovery of the Higgs boson.  
Domenico Vicinanza and his sonsifications of data from the LHC and the Voyager mission.  
The Cosmic Piano of the AUICE Experiment of CERN.  
A duet between jazz pianist Al Barber and the Cosmos.

<http://www.physicsofmusic.ch>

United Nations Orchestra  
Andréa Marguer, founder artistic director

Do you play an instrument?  
**JOIN US !**

Begin in March 2015, the United Nations Orchestra brings together talented and enthusiastic musicians, the majority of whom work at the United Nations and international agencies based in Geneva, joined by other musicians from the city and its neighbouring regions.

Under the artistic direction of a highly experienced professional conductor, the United Nations Orchestra has already developed an outstanding reputation, performing 6 to 8 concerts annually in prestigious venues. The Orchestra is regularly invited to play at official occasions and benefits of various humanitarian causes, with the goal of promoting peace through music.

Programs feature masterpieces of the classical repertoire and the most promising young world-class soloists.

The rehearsal take place once a week at UNAGS' 9th Floor Conference room.

United Nations Orchestra: Passion, Pleasure, Inspiration

Contact:  
Martine Coppens  
President and co-founder  
+41 79 339 14 33  
[info@uniorchestra.ch](mailto:info@uniorchestra.ch)  
[www.uniorchestra.ch](http://www.uniorchestra.ch)

**Collide@CERN**  
CREATIVE COLLISIONS BETWEEN THE ARTS AND SCIENCE

We are delighted to invite you to the opening presentation of  
**Data Artist, Ryoji Ikeda's residency at CERN.**  
Ryoji Ikeda, one of the world's leading electronic composers and visual artists, is the new Prix Ars Electronica Collide@CERN award winner. Ryoji Ikeda and his science inspiration partner, Theoretical Physicist, Dr. Tom Mele will talk about their work in arts and science.

**10 July, 2014 at CERN**  
GLOBE OF SCIENCE AND INNOVATION  
Doors will open at 18:30  
Followed by a drinks reception

To book your seat, please RSVP to [COLLIDE.EVENTS@CERN.CH](mailto:COLLIDE.EVENTS@CERN.CH)  
Visit Ryoji Ikeda's website: [www.ryojiikeda.com](http://www.ryojiikeda.com)  
Ikeda's latest work: [www.superimposedty.com/jvri/](http://www.superimposedty.com/jvri/)  
CERN Globe: Route de Meyrin 385, 1217 Meyrin (just outside Geneva)

**ACCELERATING INNOVATION ... IN MEDICINE**

Eleanor A. Blakely  
Senior Staff Biophysicist, LBNL

Reflections and perspectives on 60 years of particle therapy

This presentation will truly review the six decades of advanced research of CERN and the Lawrence Berkeley National Laboratory in developing the test, and their dual efforts to continue to develop the scientific basis, co-ordination, support, training opportunities and technology needed to meet the challenges for the future.

**Thursday 10th July**  
Coffee at 15:00 - Conference at 16:30  
CERN Main auditorium  
Please register on [indico.cern.ch/event/26637/](http://indico.cern.ch/event/26637/)

# Seminars

## MONDAY JULY 14, 2014

- **08:00** INFIERI **2nd Summer School on INtelligent signal processing for FrontlEr Research and Industry BioPark** Auditorium and Physics Department, Building Condorcet
- **09:15** Summer Student Lecture Programme Course **Beyond the Standard Model (1/5)** Main Auditorium
- **10:15** Summer Student Lecture Programme Course **Triggers for LHC (1/2)** Main Auditorium
- **11:15** Summer Student Lecture Programme Course **Detectors (3/5)** Main Auditorium
- **12:00** Summer Student Lecture Programme Course **Discussion Session** Main Auditorium

## TUESDAY JULY 15, 2014

- **09:15** Summer Student Lecture Programme Course **Beyond the Standard Model (2/5)** Main Auditorium
- **10:15** Summer Student Lecture Programme Course **Triggers for LHC (2/2)** Main Auditorium
- **11:15** Summer Student Lecture Programme Course **Detectors (4/5)** Main Auditorium
- **12:00** Summer Student Lecture Programme Course **Discussion Session** Main Auditorium
- **14:00** TH String Theory Seminar **TBA** TH Conference Room
- **19:30** Globe **What science for what kind of society? Reflecting the development of big science 80-1-001**

## WEDNESDAY JULY 16, 2014

- **09:15** Summer Student Lecture Programme Course **Beyond the Standard**

**Model (3/5)** Main Auditorium

- **10:15** Summer Student Lecture Programme Course **Beyond the Standard Model (4/5)** Main Auditorium
- **11:15** Summer Student Lecture Programme Course **Detectors (5/5)** Main Auditorium
- **12:00** Summer Student Lecture Programme Course **Discussion Session** Main Auditorium

## THURSDAY JULY 17, 2014

- **09:15** Summer Student Lecture Programme Course **Beyond the Standard Model (5/5)** Main Auditorium
- **10:15** Summer Student Lecture Programme Course **SM Physics at Had. Colliders (1/4)** Main Auditorium
- **11:15** Summer Student Lecture Programme Course **Introduction to Monte-Carlo Techniques (1/2)** Main Auditorium
- **12:00** Summer Student Lecture Programme Course **Discussion Session** Main Auditorium
- **14:00** TH BSM Forum **TBA** TH common room

## FRIDAY JULY 18, 2014

- **09:15** Summer Student Lecture Programme Course **SM Physics at Had. Colliders (2/4)** Main Auditorium
- **10:15** Summer Student Lecture Programme Course **From Raw Data to Physics Results (1/3)** Main Auditorium
- **11:00** Detector Seminar **Upgrade of the ALICE Inner Tracking System** Salle Anderson
- **11:15** Summer Student Lecture Programme Course **Introduction to Monte-Carlo Techniques (2/2)** Main Auditorium
- **12:00** Summer Student Lecture

Programme Course **Discussion Session** Main Auditorium

## SUNDAY JULY 20, 2014

- **08:00** HASCO Summer School **HASCO Summer School 2014 HS 5**

## MONDAY JULY 21, 2014

- **09:00** TH institutes **Conceptual advances in lattice gauge theory (LGT14)** TH Theory Conference Room
- **09:15** Summer Student Lecture Programme Course **From Raw Data to Physics Results (2/3)** Main Auditorium
- **10:15** Summer Student Lecture Programme Course **SM Physics at Had. Colliders (3/4)** Main Auditorium
- **11:15** Summer Student Lecture Programme Course **Neutrino Physics (1/3)** Main Auditorium
- **12:00** Summer Student Lecture Programme Course **Discussion Session** Main Auditorium

## TUESDAY JULY 22, 2014

- **09:15** Summer Student Lecture Programme Course **From Raw Data to Physics Results (3/3)** Main Auditorium
- **10:15** Summer Student Lecture Programme Course **SM Physics at Had. Colliders (4/4)** Main Auditorium
- **11:15** Summer Student Lecture Programme Course **Neutrino Physics (2/3)** Main Auditorium
- **12:00** Summer Student Lecture Programme Course **Discussion Session** Main Auditorium
- **14:00** TH String Theory Seminar **Scattering Amplitudes and the Deformed Graßmannian** TH Conference Room