CERN Bulletin

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SCIENCE AND PEACE: TASTE THE MAGIC IN THE BLEND

1954: CERN was born. The Laboratory was the first scientific pan-European endeavour. Just a few years after the Second World War, twelve European countries joined forces and built what has become the world's largest particle physics laboratory. In 2014, CERN will celebrate 60 years of cutting-edge science for peace.

It all started in 1949, when French Nobel-Prize-winning physicist Louis de Broglie called for the creation of a European laboratory. The idea was quickly adopted and, in 1953, twelve countries signed the Convention for the establishment of a European Organization for Nuclear Research under the auspices of UNESCO. "Next year we will celebrate the event with UNESCO in Paris at the beginning of July," says Sascha Schmeling, general co-ordinator of the 60th anniversary celebrations. "We have invited one of the founding fathers of CERN, the French diplomat François de Rose, to take part, and he has accepted the invitation with enthusiasm."

The events in Paris will be followed by celebrations on 29 September for CERN's actual birthday. "We are planning events for the personnel, the scientific community and the local and international public," says Schmeling, adding: "All the CERN Member States are invited to hold their own celebrations and some of them have already shared with us their ideas."

All the events will be coordinated by the CERN team in charge of the celebrations, who will offer help and support to all the participating stakeholders. "Regardless of where the events take place, our common goal is to highlight the role of science as a motor for peace and progress and to stress the importance of sharing science as widely as possible through education and training," Schmeling remarks.

(Continued on page 2)

TOWARDS THE NEXT CHAPTER

In the late 1970s, while the CERN community was busy preparing the SPS to operate as a collider and planning for LEP, people also had their eyes on the next chapter in the unfolding story of CERN.

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In this issue

News

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A word from the DG

(Continued from page 1)

TOWARDS THE NEXT CHAPTER

That the LEP tunnel should be built with a future hadron collider in mind was a given by the end of the decade. But there had also been proposals to build large proton storage rings, or re-equip the ISR with superconducting magnets. Some people had suggested building an electron-proton collider at CERN, and there were ambitious plans looking far into the future at a possible Very Big Accelerator to be built somewhere in the world, which went by its acronym VBA. For the field of particle physics, with its very long lead times, this is part of the normal cycle, and while most of those options never came to fruition, this process did pave the way for the LHC. Today, with the LHC programme underway, the time has come for CERN to start seriously considering the options for its post-LHC future.

Perhaps the best known of those options is a linear collider, either at CERN or elsewhere, but it's not the only one. Another was identified by the recent European Strategy update, which includes a recommendation to carry out a vigorous accelerator R&D programme with an emphasis on hadron or lepton high-energy frontier machines. With this in mind, we are launching a five-year international design study to investigate the potential for Future Circular Colliders, the FCC study, which will put the emphasis on a hadron collider with a collision energy of 100 TeV housed in a tunnel 80-100 km around. This will complement the on-going linear collider studies, which are already well established.

The FCC study will also look at the potential for a lepton collider of the same size as an intermediate step, and it will examine the lepton-hadron option. All of these possible routes have their proponents, and informal working groups have already been established under the names of VHE-LHC for the hadron machine, TLEP for the lepton machine and VLHeC for the lepton-hadron collider. The FCC study brings them together in a formal framework, and has been fixed at five years in order to provide input to the next European Strategy update, scheduled for 2018. It will kick-off with a meeting hosted by CERN in February, the details of which can be found on Indico.

In common with the VBA initiative of the 1970s, the FCC study will look at all the possible options for a circular tunnel, although the priority will be for a hadron machine. There's also another very important thing the two initiatives share: they recognise that Europe cannot do this alone. That's why we're inviting colleagues from around the world to join us in February, to help us begin the process that will lead to one potential new chapter in the global development of particle physics.

Rolf Heuer

For further reading on TLEP turn to page 4.

SCIENCE AND PEACE: TASTE THE MAGIC IN THE BLEND

(Continued from page 1)

The countdown to CERN's 60th anniversary has started. The official logo has already been launched and the effervesc(i)ence is spreading. If you have already planned an event and think it should be included in the official programme of anniversary-related celebrations, please email CERN60-DropBox@cern.ch.

Antonella Del Rosso

YEARS / ANS CERN

Calendar of events and celebrations

Autumn 2013: Launch of the "Beamline for schools" competition – a call for submissions of actual experiments to be conducted by school students on a dedicated beamline at the PS.

Spring 2014: Inauguration of the "S'cool Lab" – a space where teachers and students will be able to perform small experiments; inauguration of the Synchrocyclotron exhibition.

Beginning of July: Joint CERN-UNESCO event in Paris.

29 September: Celebration of CERN's anniversary with highest-level representatives from Member States.

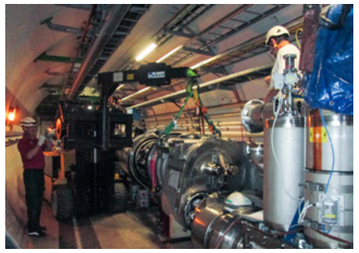
7 October: Celebration of the anniversary of the first Council session.

Throughout the year 2014: A series of historical, scientific, and technological colloquia to be held at CERN; special initiatives for the local community; arts events.

Please note that the list of events might change. Some of the events listed above will be by invitation only.

LS1 REPORT: ACHIEVING THE UNACHIEVABLE

The dismantling and extraction of a defective DFBA module from LHC Point 6, announced a few weeks ago, has been completed without a hitch. The DFBAs in the LHC are unique and irreplaceable components that must be handled with care.



The Transport team extract the defective module in one of the two DFBAs at Point 6. This module was brought to the surface, where it is currently being repared.

Dismantling and extracting part of an electrical feed box (DFBA) had not been planned and could not have been foreseen. Nonetheless, that is what had to be done. When the LS1 teams discovered that the bellows of one of the DFBAs in Sector 5-6 were damaged - and completely inaccessible - they were not exactly overwhelmed with solutions. In fact, they had only one option: to dismantle them and take them up to the surface.

Step 1: measure the alignment of the module to be taken out in relation to the beam lines to ensure that when the DFBA is put back in, it is in the right position for the beam to pass through. For that, a precise survey was carried out by CERN's surveyors. Next, the superconducting cables and cryogenic pipes were disconnected by a team of experts from the TE-MSC Group.

Finally, it was time for the dismantling. The module in question, which weighs almost two tonnes, is a particularly tricky part. "This part of the DFBA, known as a 'shuffling module', was not, in principle, designed to be removable from the rest of the electrical feed box," explains Antonio Perin (TE-CRG), project leader for the consolidation of the DFBAs during LS1. "So the dismantling, coordinated by Didier Lombard (EN-MME), was a delicate job to say the least." So much so that the superconducting cables that pass through the module could not simply be cut, but rather had to be fully disconnected, two metres further along, by a team of experts from the TE-MSC Group. The cables therefore had to be extracted from the module before it could be moved.

"Given the complexity of the operation and the fact that it had never been done before, we enlisted the help of numerous highly qualified people from various CERN departments (EN, TE, BE), possessing expertise in various fields (such as transport)," underlines Said Aiteh (EN-MME), coordinator of LS1 welding work. "Together, this team ensured that the dismantling and extraction was a success."The module is now in Building 112, where the EN-MME team is repairing it. It is scheduled to be reinstalled in its original position in early 2014; an operation that promises to be equally delicate.

Three other defective DFBAs have been identified in the LHC, of which one has already been repaired in situ and a second one is due to be repaired in situ shortly. The third, however, poses more of a problem. In all likelihood, it too will have to be brought to the surface like the Point 6 DFBA. Watch this space.

Anaïs Schaeffer

Meanwhile, elsewhere...

At the PS Booster, the reinstallation of the beam dump is on-going. The decision has also been taken to replace one of the injector's overhead travelling cranes, and two more will be consolidated. In addition, cable channels have been drilled in preparation for LS2.

At the PS, five of the seven main magnets are already in the magnet workshop. A team of specialists arrived from Russia last week to work on their consolidation.

At the SPS, steel reinforcement beams have been fixed to the roof of one of the transfer tunnels (TT10) to address the structural weaknesses observed there.

At the LHC, the first car of the SMACC train has reached Sector 3-4, the penultimate sector needing to be consolidated.

The SPS transfer tunnel, TT10, reinforced with steal beams.

FIRST H⁻ BEAM ACCELERATED AT LINAC4: 3MEV DONE, 157 MEV TO GO!

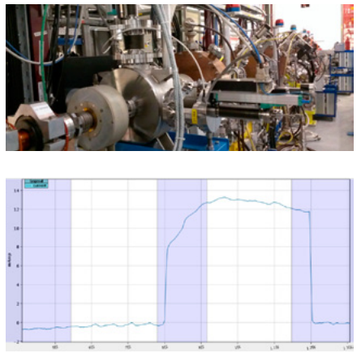
On 14 November, the first H⁻ beam was accelerated to the energy of 3 MeV in the Linac4 - the new linear accelerator that will replace Linac2 as low-energy injector in the LHC accelerator chain.

Using the recently installed Radio Frequency Quadrupole (RFQ) accelerator, 13 mA of current were accelerated to the energy of 3 MeV.

After the successful commissioning of the Linac4 RFQ at the 3 MeV test stand completed during the first months of 2013, the whole equipment (composed of the RFQ itself, the following Medium Energy Beam Transport line and its diagnostic line) were moved to the Linac4 tunnel during summer and installed in their final position. In the meantime, a new ion source was assembled, installed and successfully commissioned in the Linac4 tunnel. It was ready on time, at the end of October, to deliver the required beam at the RFQ entrance.

After a short radio-frequency commissioning required to operate it, the beam was accelerated and transported to the beam dump at the end of the diagnostic line. After this succesful initial step, three more RF structures will be progressively installed to take the H⁻ beam to the final energy of 160 MeV.

Linac4 Project Team



A view of the Linac4 taken during the recent tests (top image) and the current measured by the instruments at the end of the acceleration line on 14 November (bottom image). Images: Linac4 collaboration.

TLEP DESIGN STUDY FORGES AHEAD

As the Future Circular Collider (FCC) study is launched, one of its component parts, TLEP, enjoys a successful workshop at CERN. The FCC study looks at all options for a future circular collider with the emphasis on a hadron machine with TLEP as a possible intermediate step.

October 16 to 18 saw a three-day workshop on TLEP, the sixth in the series. The workshop took place at CERN and was well attended, informative and stimulating. To name just one of the influential people present, Herwig Schopper, ex-Director General of CERN and instrumental in the approval, construction and success of LEP, was among the participants.

But what exactly is TLEP? The name was, somehow serendipitously, coined from future lepton collider option studies and stands for triple-LEP, a machine three times the size of LEP. But this is now history. John Ellis, member of the TLEP steering group said: "I would like to think it stands for tremendous."

TLEP would make use of a new, large, 80-km tunnel to produce copious quantities of Higgs, W and Z bosons (as well as top quarks), to study their properties with unprecedented precision. The experimental precision would actually be so high that matching the theory errors would represent a formidable task. On the accelerator side, lepton collider technologies proven at B factories will be pushed to their limits to deliver luminosities many orders of magnitude higher than LEP.

Since its conception about a year and a half ago, TLEP has attracted more than 350 collaborators wishing to participate in all aspects of a design study that aims to produce a conceptual design report by 2018, in time for the next update of the European Strategy for Particle Physics. By that time, the first results of the full energy run of the LHC will be available.

Sergio Bertolucci, CERN's Director for Research and Computing, welcomed the workshop participants with an inspiring speech. He stressed that the project of future colliders in a large tunnel could well be the long term future of CERN, offering frontier machines energy (using a hadron accelerator), for precision (using lepton machines) and much more (e-p and ions). He exhorted the respective communities to push together in the FCC study, and promised that CERN will play its role in a global effort towards this ambitious goal.

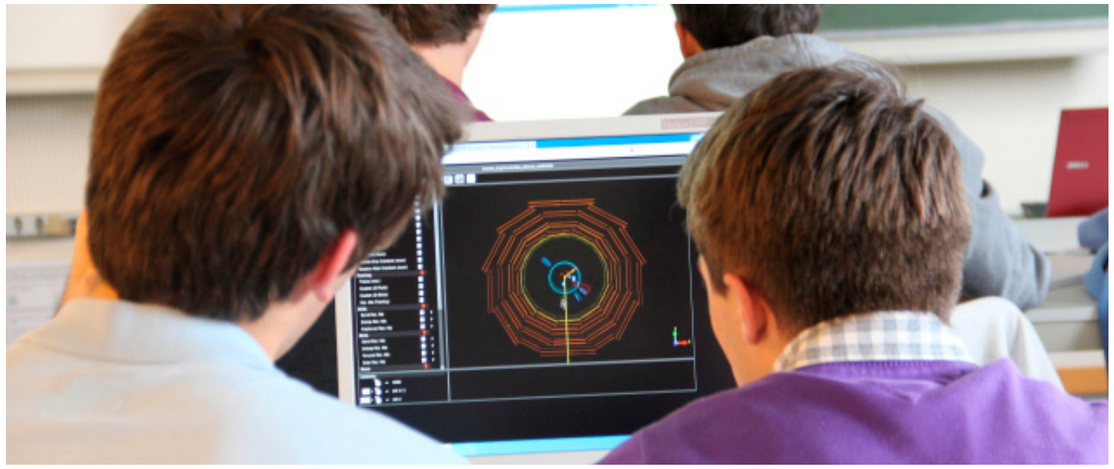
Alain Blondel & Mike Koratzinos

The Word from the DG in this issue mentions the FCC study.

The poster of the sixth TLEP workshop that took place at CERN. Japanese artist Kazuya Akimoto kindly agreed to the use of one of his works as the basis for the poster's backdrop.

LHC DATA TO BE MADE PUBLIC VIA OPEN ACCESS INITIATIVE

CMS has collected around 64 petabytes of analysable proton-proton data so far. Along with published papers, these data constitute the scientific legacy of the CMS collaboration, and preserving the data for future generations is crucial.



High-school students analysing CMS data. Image: Marzena Lapka.

"To preserve not only the data but also the information on how to use them, we intend to make available through open access our data that are no longer under active analysis," says Kati Lassila-Perini, head of the CMS Data Preservation and Open Access project at the Helsinki Institute of Physics.

Although providing open scientific data allows potentially everyone to perform their own analyses, doing so is very difficult. CMS scientists working in groups take many months or even years to perform a single analysis. Each analysis must be scrutinised by the whole collaboration before a scientific paper can be published.

CMS therefore decided to launch a pilot project for its open data aimed at education. This project, in partnership with Finland's IT Center for Science (the CSC) and partially funded by the Finnish Ministry of Education and Culture, will integrate CMS data into the physics curriculum of Finnish high schools.

CMS data are classified into four levels in increasing order of complexity. Level 1 is all data in CMS publications. Level 2 data are small samples selected for education programmes; while students get a feel for how physics analyses work, they cannot do any in-depth studies.

Level 3 is what CMS scientists use: it includes meaningful representations of the data along with simulations, documentation and software tools. CMS is making these analysable Level-3 data available publicly, in a first for high energy physics. Level 4 consists of the so-called "raw" data – all the original collision data without any physics objects such as electrons and particle jets being identified. These data will remain available only to the members of the collaboration.

CMS wants to enable people outside the collaboration to build educational tools on top of its data but performing a physics analysis requires lots of digital storage and distributed computing facilities. "If someone wants to download and play with our data," cautions Lassila-Perini, "you can't tell them to first download the CMS virtual-machine running environment, ensure that it is working and so on. We therefore need data centres like the CSC to be intermediate providers for applications that mimic our research environment on a small scale."

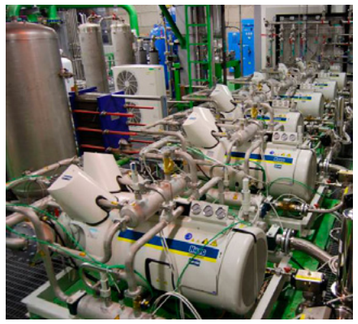
Finland is ideal to pilot this programme. 75% of Finnish high schools have classes that have visited CERN, and thanks to CERN's teacher programmes many teachers are familiar with the basics of particle physics. An ongoing survey of the teachers will help understand their perspectives on teaching data analysis and take on board ideas for potential applications.

Lassila-Perini has big dreams. "Imagine a repository of particle physics data to which schools can sign in," she says. "They collaborate with other high schools, develop code together and perform analyses, much like how we work. It is important to teach not just the science but also how science works: particle physics research isn't done in isolation but by people contributing to a common goal."

Achintya Rao

A THERMOSIPHON FOR ATLAS

A new thermosiphon cooling system, designed for the ATLAS silicon detectors by CERN's EN-CV team in collaboration with the experiment, will replace the current system in the next LHC run in 2015. Using the basic properties of density difference and making gravity do the hard work, the thermosiphon promises to be a very reliable solution that will ensure the long-term stability of the whole system.



Former compressor-based cooling system of the ATLAS inner detectors. The system is currently being replaced by the innovative thermosiphon. (Photo courtesy of Olivier Crespo-Lopez).

Reliability is the major issue for the present cooling system of the ATLAS silicon detectors. The system was designed 13 years ago using a compressor-based cooling cycle. "The current cooling system uses oil-free compressors to avoid fluid pollution in the delicate parts of the silicon detectors," says Michele Battistin, EN-CV-PJ section leader and project leader of the ATLAS thermosiphon. "After a few years of operation, the compressors started suffering fatigue problems that caused important failures and frequent leaks. Significant resources were then devoted to investigating the problem and in 2009 we found a solution to reduce the effects of the fatigue but we were not able to fix the causes. The system has allowed the ATLAS inner detectors to be cooled to -20°C since then, but it was always evident that these compressors would not be a long-term solution."

Since 2010 the CERN and ATLAS experts have been exploring alternative solutions to the problem. "We looked for new types of oil-free compressors available on the market but without success. In parallel, we tried to find alternative solutions to cool the detector, and we eventually decided to design a thermosiphon system," explains Battistin.

The new thermosiphon system (see box for a technical description) will allow the cooling fluid to circulate naturally without any mechanical pumping component in the circuit. Instead, the system uses gravity – the ATLAS experiment is situated 92 metres below ground – to create the pressure difference that drives the movement of the fluid. "This system will require less maintenance, and the absence of vibration will prevent the development of fluid leaks," says Battistin. "Therefore, the circuit is oil-free by definition and allows us to adopt the most standard industrial solutions to condense the fluid. Moreover, once condensed, the large quantity of cooling fluid will act as an important energy buffer that will allow the system to work for several minutes in the event of a power cut."

The coolant currently used in the thermosiphon is perfluoropropane (C3F8), which evaporates at -20°C in the inner parts of the silicon detectors, thereby taking the heat away from the delicate silicon sensors and related electronics. "The thermosiphon solution will allow lighter fluid mixtures like C3F8-C2F6, to be used," says Michele Battistin. "This will reduce the coolant evaporation temperature to -30°C if so required by the ATLAS inner detector groups. Lowering the temperature of the detector, in fact, helps the silicon sensors to sustain the effects of radiation damage, and increases the lifetime of the detector."

"The project was launched in 2010, mainly relying on CERN and ATLAS resources for the design, integration, purchase, assembly, installation and commissioning of the system, and has made use of a wide range of our colleagues' skills, and of the competences of a number of CERN and ATLAS colleagues," says Battistin.

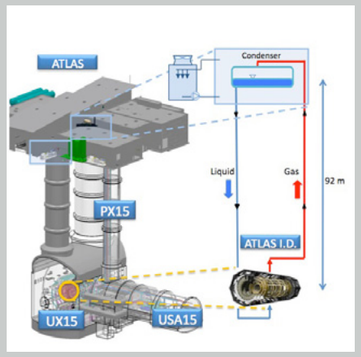
The ATLAS thermosiphon system is now entering the commissioning phase. It will be operational at the start of the next LHC run in 2015. From then on, the previous cooling system will be used as a back-up system in the event of a breakdown or maintenance work.

Rosaria Marraffino

Technical description

The thermosiphon system provides warm (20°C), high-pressure liquid perfluoropropane (C3F8) at the detector's distribution point. The liquid expands inside capillaries and evaporates at –25°C and 1.67 bar on the silicon detector structures. The warm (20°C) gas collected at the detector exhaust is taken to the thermosiphon condenser located on the roof of the SH1 building at Point 1. Here, the gas is liquefied at 0.3 bar (-60°C). The 92-m-high liquid column creates up to 16.5 bars of hydrostatic pressure at the detector's liquid distribution point.

The thermosiphon system will circulate 1.2 kg of perfluoropropane per second to remove up to 62.4 kW of heat dissipated by the ATLAS inner silicon detector electronics. This fluid is radiation-resistant and dielectric; therefore, in the event of an accidental leak, it would not damage the silicon detector.



Thermosiphon diagram.

TEENS JOIN THE MOEDAL COLLABORATION

The principal investigator for any institute joining an experimental collaboration is generally a self-assured researcher with evident leadership skills and an in-depth knowledge of their subject gained over many years. Katherine Evans fits the brief in every respect, except that she is 17 years old and her research institute is the Langton Star Centre, based at the Simon Langton Grammar School for Boys. The school has just joined the MoEDAL experiment.

Teacher Becky Parker (left) with two students from the Simon Langton Grammar School for Boys in the MoEDAL experimental area.

MoEDAL, the latest LHC experiment has detectors located close to the interaction point of the LHCb experiment. This new experiment is designed to search for the highly ionizing avatars of new physics at the LHC, specifically the magnetic monopole or dyon and other highly ionizing stable massive particles from a number of beyond-the-Standard-Model scenarios. MoEDAL was approved in 2010 and is due to start taking data in the Spring of 2015.

One of the key physics motivations for the MoEDAL experiment is the search for the electroweak monopole, whose mass has recently been estimated to be within the reach of the LHC. "Of all the exotic particles, monopoles are thought to be the most likely," explains Richard Soluk, a MoEDAL scientist from the University of Alberta. "The maths looks better if they exist!"

By CERN standards, MoEDAL is a small collaboration and this makes the involvement of a school even more noteable. But Langton takes a very different approach to science, encouraging its students to participate in fundamental research alongside established research institutes and universities.

Katherine Evans is leading the project for Langton: "We only started the project in September 2013. There are about 25 of us and we meet twice a week to work on MoEDAL. People read up on topics outside the group meetings."

The school has been working with Timepix chips on a variety of projects for some time and, as Katherine says, "some people at school know the chip inside out." It's this knowledge of Timepix, and specifically using it to monitor radiation, that interested MoEDAL.

James Pinfold, Spokesperson for the MoEDAL collaboration, says, "The TimePix pixel device system is key to the measurement, and our understanding, of the radiation background that the MoEDAL experiment will encounter at the LHC. The Langton Star Centre's experience with the TimePix device will be invaluable to the MoEDAL effort. I am thrilled that we have had this chance to directly involve young school students and their teachers in the excitement and importance of fundamental research. Also, I think this involvement is a first for high energy physics"

The opportunity to be involved in fundamental research, whether it is looking for exotic physics beyond the Standard Model or producing a UK map of background radiation levels, undoubtedly inspires the students: 1% of the current cohort of UK physics undergraduates came from Langton. "Physics isn't just something I learn in the classroom," says Katherine. "This project has made me more passionate about the subject. I'm planning to study physics at university and I hope I can stay involved in MoEDAL."

Stephanie Hills

You can find out more about some of Langton's projects by watching Dr Becky Parker talking at TEDxCERN:

CERN APPS MEET IN A FORUM

In the fast-evolving world of mobile apps, creativity and usability are key words. For the time being, the number of CERN apps is quite limited but the situation could quickly change. An information-sharing forum set up by the IT Department is a starting point to channel your creativity with the help of experts, best practices and useful guidelines.

The CAPPS (CERN Apps) Forum was set up about a year ago. Its members come from various departments and meet every two or three months to update each other on the apps that are in preparation, share the latest news on the available software, discuss best practices and so on. "The Forum is open to anybody wanting to develop apps at CERN," explains David Foster, Deputy Department Head and initiator of the CAPPS Forum. "Developers, communication experts and IT infrastructure experts meet and discuss various topics, from branding-related issues to coding and implementation solutions. The aim is to go forward in a coherent way."

During its first year of operation, the Forum has established itself as a reference point for anybody actively involved in developing mobile apps at CERN. "We want to have concrete discussions, so the Forum is for people really active in this area, and everyone has to present their projects and issues," says Foster.

On its Indico pages, people interested in developing apps will find useful material including information about the signing workflow, presentations about the use of specialised software, and new tools and

platforms for developers. "This proved extremely useful in generating interest and effort to create the apps for the OpenDays 2013. We are now discussing if and how to take the CAPPS Forum a step further," says David Foster. "The ideal evolution of the Forum would be a permanent structure where people wanting to develop apps at CERN could find resources and expertise. However, apps present some significant process and procedural problems given that they impact CERN's image and are widely distributed."

Although plans for the future have not been defined yet and all the various options are still under discussion, the Forum is keeping up the momentum. "We have identified what the problems are and what needs to be done in the field of CERN-branded mobile apps," says Foster. "We will keep monitoring the interest of the CERN community in developing new apps. If you wish to develop an app and you are looking for information, the Forum is your best resource to start with." In other words, do not hesitate to sign up for the CAPPS Forum by subscribing to the CERN-APPS@cern.ch mailing list.

For any other information, e-mail David.Foster@cern.ch

Antonella Del Rosso

Take note

SNOW, ICE... AND OTHER REASONS TO BE CHEERFUL!

CERN's roads, car parks, pavements and pedestrian areas cover an area of 60 hectares in total. The EN-HE Group is responsible for clearing snow from and salting the roads and car parks. The GS-IS Group, through its contracts for the cleaning and maintenance of green spaces, is responsible for clearing the snow from, salting and sanding the pavements, pedestrian routes and entrances to buildings, and for replenishing the bins of silica sand*, which will be used in place of salt in the bins from now on.

In the event of heavy snowfall, general snow-clearing operations are initiated by the CERN Control Centre (CCC), from 3 a.m. for roads and car parks and from 4 a.m. for pavements, pedestrian routes and building entrances in preparation for clearing to begin at 3.45 a.m. and 4.30 a.m. respectively. One-off operations during the day may be initiated by the Fire Brigade, site managers, the security guards or the CMS control room. Bins of silica sand are also provided so that individuals can sand the areas around entrances themselves if necessary. Make use of these bins and inform the Service Desk (77777) so that any further action that may be required can be taken. Finally, to ensure that the bins are fit for use at all times, remember and remind others that they are not rubbish bins!

At weekends and on public holidays, the procedure is the same but the times differ: operations are initiated at 7 a.m. for roads and at 8 a.m. for pavements, pedestrian routes and building entrances. During the day at weekends, the priority is to clear the snow from the areas around the Globe, the Main Building, the Route de l'Europe and Building 33.

If you need to arrange for snow clearing on working days, call **72201** in the case of roads and car parks, or **77777** in the case of pavements, pedestrian routes and building entrances and they will forward your query to the relevant service.

Advice for avoiding accidents: Wear weather-appropriate footwear. When walking around the site, use routes that have been cleared of snow and salted or sanded whenever possible. Avoid cutting across areas that are icy or from which the snow has not been cleared. Take care as some surfaces can rapidly become very slippery and crossing from one type of surface to another can be hazardous. Be careful when getting out of your vehicle and when exiting a building.

And remember: safety is everyone's responsibility!

We remain available for any further questions or suggestions.

**Salt does not work on already-formed ice in temperatures below -5°C. Silica sand is more environmentally friendly and retains its non-slip properties at any temperature.*

Handling Engineering Group - EN Department
Integrated Services Group - GS Department

SAFETY BULLETIN 2013-3

The HSE Unit just released the Safety Bulletin 2013-3 entitled "Drive with caution!".

The Bulletin is available on EDMS under the following number: **1325442**. Be reminded that HSE Safety Bulletins are published in English and French and share feedbacks of incidents/nearmiss/accidents that happened on the CERN site with the aim to improve prevention.

HSE Unit

LIGHTS ON FOR DAYTIME DRIVING: MANDATORY FROM 1 JANUARY 2014

In accordance with the Swiss Federal Decree of 15 June 2012, it will be mandatory from 1 January 2014 to keep your vehicle lights permanently switched on when driving on Swiss territory.

New vehicles are now equipped with daytime running lights which switch on automatically. For older vehicles, side lights can be used as daytime running lights, and it is always possible to fit specific daytime running lights to a vehicle at a later date.

This measure is already in force in most European countries and is particularly aimed at improving the visibility of vehicles and helping pedestrians and cyclists to judge the distance and speed of an approaching vehicle more easily.

From 1 January 2014, this obligation applies to all "automobiles (passenger cars, heavy goods vehicles, delivery vehicles and coaches)"[1] as well as to "motorcycles" driven on Swiss roads. "Electric bicycles and vehicles in circulation before 1970"[2] are exempt.

As Swiss traffic regulations apply on the Swiss part of the CERN site and French traffic regulations apply on the French part, the above requirement must be respected when driving on the Swiss part.

In France, driving with lights on permanently is not mandatory but is strongly recommended. Drivers are encouraged to apply this safety measure even on the French part of the CERN site.

HSE Unit and GS Department

(1) and (2) *Swiss Confederation, Via sicura – Information sheet, Measures covered by the Federal Decree of 15 June 2012, 2nd package.*

For further information (in French):
• Loi fédérale sur la circulation routière, modification du 15 juin 2012.
• Touring Club Suisse (TCS) : obligation dès le 1er janvier 2014 de rouler de jour avec les feux allumés.

NEW! BETTER SECURITY DUE TO MULTI-FACTOR AUTHENTICATION

Have you ever worried about using your password for logging into critical applications (like accelerator or experiment control systems), as an administrator for computing services, or for authorising expensive orders in EDH? You are right to worry. If your password is lost or stolen, the lucky finder or malicious thief might misuse your access rights to wreak severe havoc on the operation of the Organization.

Rubén Santamarta, a well-known security researcher, discovered a near-miss in 2011. He reported how he had uncovered a password that provided read access to the LHC cryo controls. This is as close as it can get to disaster. Fortunately, the password only allowed read access (but had no modification rights). And, of course, Santamarta was nice enough to share his findings with us.

In order to improve on that, the CERN Single Sign-On portal now provides the means for "Two-Factor Authentication". "Authentication" is the process where you digitally prove who you are. Usually, your identity is verified when you type in your password. As you should never (!) share your password with anyone else, only you can provide the correct password to your digital identity. Your identity has been correctly authenticated. At CERN, you basically have one password that is attached to your CERN account and the CERN Single Sign-On portal is the central instance for authentication; some special applications might require additional accounts and passwords but we try to reduce them to a minimum, as remembering many different passwords is hard.

However, for the aforementioned critical applications or those currently used within the CERN Finance Department or in the CERN Computer Security Team, "just" knowing a password might not be sufficient as passwords are regularly stolen or lost*. "Two-Factor Authentication" is an enhanced method and requires you not only to know a password but also to have with you a piece of hardware. As there is no single second factor that suits all needs, the Single Sign-On portal allows you to authenticate with any of these four pieces of hardware:

- **your CERN mobile phone:** you are asked to provide a unique 6-digit authentication code sent to this phone via SMS.
- **your personal SmartPhone running the "Google Authenticator"-app:** you are asked to provide a unique six-digit authentication code calculated by "Google Authenticator".
- **a Yubikey USB:** pressing the only button on the Yubikey produces a long one-time password string.
- **your CERN Access Card with a special integrated SmartChip:** insert your card into a dedicated SmartCard reader, provide a PIN, and unlock the stored certificate.

It is up to you to select your preferred hardware(s). A CERN mobile phone can be obtained from the Telecom Lab; "Google Authenticator" can be downloaded from your favorite app store (e.g. iTunes); Yubikeys will soon be available from the CERN stores (for the time being, please contact the Computer Security Team); a compatible CERN Access Card with a visible "golden" SmartChip will soon be available from the Registration Service (for the time being, please contact the Computer Security Team).

The only remaining task before using your hardware tokens is to match them with your CERN account at one of the SSO self-service stations, e.g. at the Registration Service in building 55 (ground floor), at the Service Desk office in building 55 (2nd floor) or in the IT secretariat in building 31 2-017 (you will need your CERN access card at the last of these). Once configured, all your hardware preferences are listed in the "Account Management" section of the Resource Portal. From there, you can also delete them if, for example, the hardware has been lost or stolen, or if you simply do not need it any more.

Computer Security Team

** You might think of other critical applications and we encourage every service owner to reflect on whether two-factor authentication is an appropriate means to better protect their application.*

For further information on multi-factor authentication, please have a look at Computer Security recommendations or check out our website or e-mail ***Computer.Security@cern.ch*****.**

CERN SHOP CHRISTMAS SALE

Seminars

THURSDAY NOVEMBER 28, 2013

- 11:00 Collider Cross Talk **[TBA: monojet]** TH common room
- 14:00 TH BSM Forum **TBA** TH common room

FRIDAY NOVEMBER 29, 2013

- 11:00 Detector Seminar **Current status and future prospects of pixel detectors** Salle Dirac
- 14:00 Other Seminars **Turkey-CERN Relationships**

MONDAY DECEMBER 02, 2013

- 11:00 Academic Training Lecture Regular Programme **Neutrinos (1/3)** TH Conference Room
- 11:15 Academic Training Lecture Regular Programme **Neutrinos (1/3)** TH Conference Room

TUESDAY DECEMBER 03, 2013

- 08:30 Induction Sessions **INDUCTION PROGRAMME - 2nd Part - UNDER PREPARATION** 80-1-001 - Globe 1st floor
- 11:00 Academic Training Lecture Regular Programme **Neutrinos (2/3)** TH Conference Room
- 11:15 Academic Training Lecture Regular Programme **Neutrinos (2/3)** TH Conference Room
- 14:00 TH String Theory Seminar **Elliptic genera and mock modular forms** TH Conference Room
- 14:00 John Adams Lecture **120 Years of Accelerators that Heal** Kjell Johnsen Auditorium

WEDNESDAY DECEMBER 04, 2013

- 11:00 Academic Training Lecture Regular Programme **Neutrinos (3/3)** TH Conference Room
- 11:15 Academic Training Lecture Regular Programme **Neutrinos (3/3)** TH Conference Room
- 11:30 TH Cosmo Coffee **TBA**
- 14:00 TH Theoretical Seminar **TBA** TH Conference Room

Official news

102ND ACCU MEETING

DRAFT Agenda for the meeting to be held on Wednesday 4 December 2013 at 9:15 a.m. in Room 60-6-002.

1. Chairperson's remarks
2. Adoption of the agenda
3. Minutes of the previous meeting
4. News from the CERN Management
5. Report on services from GS Department
6. Progress on Health Insurance for Users
7. Users Office News
8. Reports from ACCU representatives on other Committees
   a. Accommodation Facilities Working Group
9. Matters arising
10. Any Other Business
11. Election of a new ACCU Chairperson
12. Agenda for the next meeting

Anyone wishing to raise any points under "Any Other Business" is invited to send them to the Chairperson in writing or by e-mail.

Michael Hauschild (Secretary)

ACCU is the forum for discussion between the CERN Management and the representatives of CERN Users to review the practical measures taken by CERN for the work of Users of the Laboratory. The User Representatives in ACCU are:

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The CERN Management is represented by Rolf Heuer, (Director General), Sergio Bertolucci, (Director for Research and Computing), Sigurd Lettow (Director for Administration and General Infrastructure). The Physics Department is represented by Jose Salicio Diez and Doris Chromek-Burckhart (Head of the Users Office), the Human Resources Department by Ingrid Haug, the General Infrastructure Services Department by Reinoud Martens, the Occupational Health Safety and Environmental protection Unit by Enrico Cennini, and the CERN Staff Association by Michel Goossens. ACCU Secretary: Michael Hauschild.

Other members of the CERN personnel attend as necessary for specific agenda items. Anyone interested in further information about ACCU is welcome to contact the appropriate representative, or the Chairperson or Secretary (**73564** or ACCU.Secretary@cern.ch).

http://cern.ch/ph-**dep-ACCU/**

Computer Security

BACKED UP AND GONE...

Remember how easy it is to lose your passwords for web applications ? This time we go bigger and discuss how easy it is to lose the passwords for every wireless access point you've visited. You just need to be running Android on your smartphone...

Apparently, Google was already capturing wireless access points during its Streetview campaign but was forced to stop this after complaints from data protection advocates. It was done "mistakenly".

With Google's Android now dominating the smartphone market, they're back to their old tricks. As a useful feature, Android (version 2.2 and higher) stores the identifiers ("SSIDs") of wireless access points and credentials by default, so that you do not have to reissue them on every connection. The interesting part happens when the smartphone is automatically backed up to Google's data centres: the SSIDs and the associated passwords are not encrypted once they are there. Thus, Google has full access to them and could, potentially, produce a "free access map" to many wireless access points worldwide. Of course, this would help some anonymous government agencies. Along with Wi-Fi passwords, your keychain is also automatically synced; presumably this includes your CERN passwords as well as your private ones. Not to mention all your other data (photos, emails, videos, apps, etc.) that "vaporizes" once it is backed up in the Google cloud (see our Bulletin article on this subject: "Send your data into the cloud and make it... vaporize").

However, this does not make an Apple Mac or iPhone safer. Once iCloud has been enabled, your device is regularly mirroring all information to Apple's computer centres: Apps, Music and Films might be fine as you most likely have bought them via the iTunes store. But what about your calendar entries, e-mails, photos and films? It is up to Apple's discretion whether to analyse this data and use it for advertising purposes (or send it to the aforementioned agencies). Worse, while today you can still disable "iCloud" functionality (iOS -> Settings -> General -> Usage), in the future this might not be possible. Discussions have emerged about whether on "OS X Mavericks there is no longer a way to sync any i-device except through the cloud".

In more blunt terms, this would imply that iOS users are forced to provide all their data (or give up on iPhone). Furthermore, Apple is not the only one targeting your data. LinkedIn recently published an app that diverts all your emails through their central servers for data mining. With the NSA and GCHQ spying on us from one side, and big companies like Apple and Google doing the same from the other, what's left but to sigh, give up and let it happen? Smash your phone and go back to the communication stone age? Rally and hope that politicians tackle the problem? Be less paranoid than the security guys at CERN? We are very curious about your opinion!

Check out our website : **cern.ch/security** 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/en/monthly_reports.shtml

Computer Security Team

Ombuds' Corner

ETHICS AND COMPASSION

We can all agree that efficiency leads excellent results; this is a cornerstone in research and organisational matters. However, people may not unanimously point to which method of management and leadership is best for achieving such a goal.

Some believe in an authoritarian approach, pushing people to their maximum potentials; others advocate a softer approach, making close friends with everyone; and some have no strategy for workplace relationships, and only consider due dates and deliverables. All of these methods can be very effective, but none is completely perfect. Beyond such methods, at the source of working relationships, ethics and compassion should "shine like a lighthouse over the ocean of the tasks to undertake". Why?

When hearing "ethics" and "compassion" linked together, people may think: "Oh! We do not need to like each other; we just have to work together!" But we are the creators of our environment. As a result, I would imagine that we would all like to create a world in which we can live harmoniously, feeling free, and working with enthusiasm and happiness. That is compassion, and it requires good ethics. Harsh management creates a harsh world for its leader; in the end, the leader – and everyone around them – will suffer.

Ethics and compassion find their source within us. Only if we are filled with good ethics can we spread it to those around us. Only if we understand compassion - creating our own world in which we can live joyfully – can we spread compassion and create a work ambiance where everyone is recognized and is eager to perform with maximum efficiency. Ethics and compassion should never be considered weaknesses, but rather as essential elements for providing a working environment favourable to the best effectiveness.

So, to achieve excellence in our working relationships, which goes hand in hand with scientific and administrative excellence in our laboratory, we have to start with ourselves. The Ombuds is always at your service to discuss cases and provide confidential feedback.

Vincent Vuillemin

As a reminder, all previous Ombuds corners can be accessed in the Ombuds blog : ***http://ombuds.web.cern.ch***

Library

NEWS FROM THE LIBRARY: "NATURE" IS ACCESSIBLE TO THE CERN COMMUNITY FROM 1869!

The Library's paper collection of *Nature* predates the creation of CERN, starting in 1951. Its online collection of the journal dates back to 1869.

These historical articles - "On a new kind of rays", "Artificial production of fast protons", "Possible existence of a neutron", "The Neutrino"- have one thing in common: they were all published in *Nature*. Now, there is something else to them: they are all accessible online to the CERN community.

The Library's paper collection to *Nature* dates back to 1951, and more than 60 years on, we are finally able to provide access to the complete collection of this key journal, starting from volume 1 (dated from 1869). Please feel free to explore and enjoy!

Your feedback is welcome: send us a message to library.desk@cern.ch.

CERN Library