CERN Bulletin

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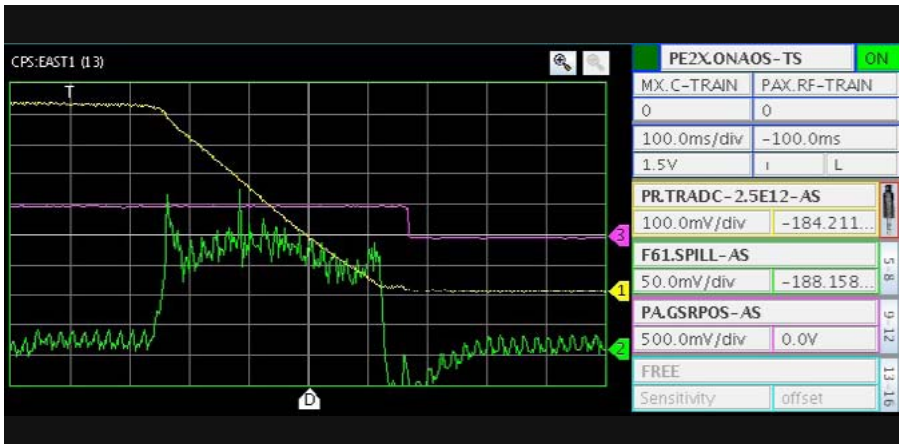
FIRST ACCELERATOR-BASED PHYSICS OF 2014

Experiments in the East Area received their first beams from the PS this week. Theirs is CERN's first accelerator-based physics since LS1 began last year.



For the East Area, the PS performs a so-called slow extraction, where beam is extracted during many revolution periods (the time it take for particles to go around the PS, ~2.1 µs). The yellow line shows the circulating beam current in the PS, decreasing slowly during the slow extraction, which lasts 350 ms. The green line is the measured proton intensity in the transfer line toward the East Area target.

Although LHC physics is still far away, we can now confirm that the injectors are producing physics! In the East Area - the experimental area behind the PS - the T9 and T10 beam lines are providing beams for physics. These beam lines serve experiments such as AIDA - which looks at new detector solutions for future accelerators - and the ALICE Inner Tracking System - which tests components for the ALICE experiment.

"In the weeks since completing hardware tests, the Operations team has been hard at work setting up the beams for physics," says Rende Steerenberg, PS section leader. "On Thursday, 10 July, we began extracting beams towards the East Area transfer line and by Monday evening the beam was hitting the East Area's target. The next day, beams were in the T9 and T10 beam lines for physics."

These beams are arriving at a refurbished East Area, which has seen its fair share of changes during LS1. "The T7 beam line and the DIRAC experiment have been completely removed," says Lau Gatignon, who is leading the East Area renovation project. "We've also replaced our primary target, which is used to create the hadron and electron beams that are then sent down the different lines." The new, more robust target will allow a monitoring screen to be permanently in place while there is beam (see image p.2). This addition will greatly help the Operations team and thus improve the continuity of the beam for physics.

(Continued on page 2)

TAKING SESAME TO THE CLASSROOM

The 2014 High School Teacher Programme (HST) is well under way, and this year it has a distinct Middle Eastern flavour, with eight teachers from the region among the 54 taking part.

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NEWS

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A word from the DG

(Continued from page 1)

Taking SESAME to the classroom

Established in the late 1990s, HST is a three-week residential programme in English designed to give teachers a taste of frontier research and promote the teaching of modern physics in high schools. Along with the more than 30 other teacher schools given in the native language of the participants, HST aims to help teachers bring modern physics to the classroom and motivate their students to study science at upper secondary school and university.

As part of the HST programme, teachers form working groups to develop lessons based on CERN science. This year, however, with eight teachers coming from Israel, Palestine, Iran and Jordan, all of which are members of SESAME, the international laboratory for Synchrotron-Light for Experimental Science Applications in the Middle East, one group is working on a different area of science. SESAME, currently under construction, is a light source. It will circulate beams of electrons that will in turn produce intense pulses of X-rays with wavelengths and intensities that allow the detailed study of objects ranging in size from viruses to atoms.

SESAME has much in common with CERN. It was established under the auspices of UNESCO, as was CERN, and it has the dual mission of providing a centre of excellence for science and a catalyst for peace in a troubled region, as was CERN 60 years ago. The eight teachers from SESAME member states are therefore working on lesson plans for 13-to-15-year-old students based on the science, its potential applications and the harmonious influence SESAME is already having on relations between its members. They are also looking at the success CERN enjoys in providing a forum for international dialogue, and they are drawing parallels between the two laboratories, so that when they go home they can show their young students a different vision of the region in which they live.

Eight teachers may seem a small number, but then when the idea for SESAME was first mooted it seemed an impossible dream. Yet today, its construction is nearing completion, it has a scientific user community waiting in the wings to carry out world-class research, and now it is on its way to Middle Eastern school classrooms. A little over 60 years ago, a world-leading institute for particle physics with over 11,000 users of 100 nationalities must have seemed a pretty remote prospect for Europe, yet here we are. Let us hope that years from now, we'll be able to join in another festival of science for peace, this time in another part of the world.

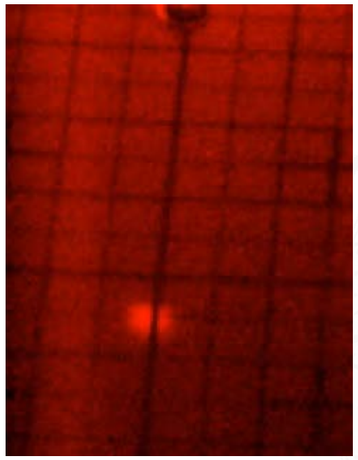
Rolf Heuer

FIRST ACCELERATOR-BASED PHYSICS OF 2014

(Continued from page 1)

Although experiments on the T9 and T10 lines will be conducting physics, the East Area renovations are by no means complete. "The IRRAD and CHARM facilities, in the south zone of the East Area, are still under construction," says Michael Lazzaroni, technical activities coordinator for the East Area. "These works will be completed by mid-September, at which point the East Area will be fully available for physics." In September, the CLOUD experiment on the T11 beam line will start its data-taking period.

These first physics beams are but a taste of what's to come as the accelerator chain continues its awakening. Next up: the ISOLDE and n_ToF experiments, which should receive beams for physics by the end of the month.

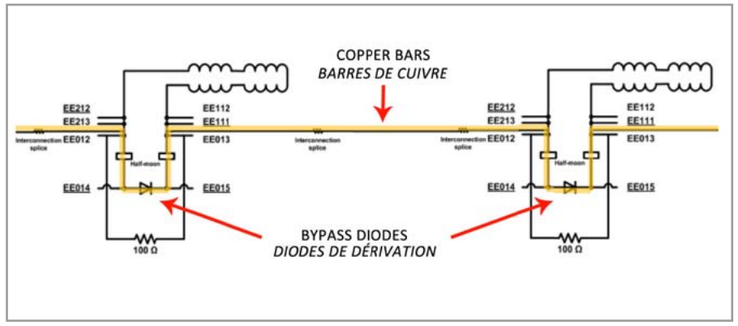


The primary proton beam, extracted from the PS, is guided through the transfer line towards the East Area, where it hits the target and produces secondary particles for the users. The small bright spot is the primary proton beam impinging on the target in front of the experimental areas.

Katarina Anthony

LS1 REPORT: TESTING PLAN B

A team from the TE Department is currently testing the secondary electrical network for the LHC's main dipoles – that is, the power circuit used in the event of a quench (loss of superconductivity). This secondary network is essential for the safety of the machine and has been strengthened as part of the SMACC project.



In event of a quench, the current travels via a secondary circuit.

In order to reach an energy of 6.5 TeV per beam, the LHC will need to be supplied with an electrical current of 11 kA. While the machine's dozens of kilometres of superconducting cables usually transport the current without any problems (i.e. with no electrical resistance), quenches can sometimes occur as a result of instabilities that cause a loss of superconductivity. In this case, the current travels via a secondary circuit, a short back-up network: diodes that divert the current if the quench occurs in a magnet and copper bars if it occurs in an interconnection (see picture). Of course, it's important to make sure that this plan B is foolproof.

It's for this reason that CSCM (copper stabiliser continuity measurement) tests are being carried out. "The principle of these tests is to inject a high current into the accelerator and 'force' it to use that secondary network," explains Hugues Thiesen, the CSCM tests coordinator. "We run the tests at a temperature of 20 K - a temperature at which the LHC cables can't act as superconductors. They therefore impede the current, forcing it to travel via the secondary network."

Sensors already installed in the LHC's electrical circuit allow the team running the CSCM tests to check that everything is going as planned. "If we detect a problem of too much resistance, we immediately cut the power, which dissipates straight away since almost no energy is accumulated in the machine during the CSCM tests," Thiesen stresses. During the LHC's normal operation, on the other hand, the amount of energy that accumulates is enormous and it takes no less than 300 seconds for it to be evacuated via the secondary circuit, risking damage to the equipment. During the CSCM tests, this time is reduced to a few hundred microseconds, which in turn reduces the risk to the accelerator.

The tests are currently being carried out in Sector 6-7, where a current of 7 kA has just been injected – it is being progressively increased in seven stages, from 400 A to 11 kA. The CSCM tests in this sector should be completed in the next few days and, depending on the results, a decision will then be made as to whether to run the tests in the LHC's other seven sectors too.

Meanwhile, elsewhere...

At the LHC, cool-down of Sector 8-1 has begun. Sector 1-2 is next on the list, where cool-down should begin at the end of next week. Vacuum teams are preparing for beam, conducting leak tests and bake-outs of the beam pipe in different sectors.

Meanwhile, final checks - including warm magnet tests, warm busbar measurements and ELQA tests - continue to take place throughout the accelerator. Preparations for one of these tests revealed damaged surface cables; during the shutdown, these cables had become tasty treats for martens! The damaged lines have been replaced and no further issues were found.

Over at the SPS, hardware tests have revealed a damaged TIDVG. Its replacement is scheduled for August and will not affect the works currently on-going.

Anaïs Schaeffer & Katarina Anthony

NEW PATENT IN SIGHT FOR CERN-MADE TECHNOLOGY

A portable gamma and beta radiation survey meter capable of operating in a strong magnetic field is the most recent subject of a CERN patent application. Developed by members of the HSE Unit, the new instrument may find applications not only in research laboratories but also in hospitals where radioactivity is managed in the presence of magnetic fields.

The new instrument consists of two parts: an active probe and a counting unit. Inside the probe, a scintillating crystal sends its signal to a photo detection module, which in turn is connected to the electronics. The counting unit is a portable box to be fixed on the operator's waist. Tested in a magnetic field up to 1 Tesla, this innovative radiation survey meter has an operating range of a fraction of μSv/h to 1 mSv/h for the ambient dose equivalent rate, and 45 keV – 1.3 MeV for photon energy, with a fast response. "The instrument is the result of a collaboration between CERN and the Milan Politecnico in Italy," explains Marco Silari, member of the HSE Unit and project leader. "It was originally developed following a request from the LHC experiments, which asked the RP Group to perform radiation measurements in the experimental halls and inside the ATLAS detector without switching off the magnetic field."

The radiation survey meter could be used in all environments where radiation is present in conjunction with magnetic fields. Indeed, the CERN-developed solution is unique, as previously available instruments could not be operated in the presence of magnetic fields. "Such a tool could be very useful for medical particle accelerators where the measurement of residual radioactivity could be performed without switching off the rest of the instrumentation," says Silari. "In a hospital using PET and MRI imaging, in which radiation is used in a magnetic environment, our survey meter could be an essential aid to operators."

In addition, the instrument could find applications in mineral processing, where the separation of magnetic particles is done in the presence of ferromagnetic minerals. In fact, very often, natural radioactivity is present and the potential inclusion of orphan sources may be a concern and require monitoring. Similarly, radioactive contamination needs to be monitored in the continuous casting of steel and other metals, where a magnetic field is used to ensure the quality of the casting process. For all these industrial processes, the new instrument would be the ideal solution to an old problem.

The team of CERN-Politecnico researchers has so far produced five units for internal use at CERN but the research and development phase will continue. "We have received contributions from the KT Fund and we have the full support of the HSE Unit," explains Silari. "We are now developing a more affordable counting unit and other types of probes that could be connected to the central unit when deeper information about the radiation field is needed. We would also like to test the probe in a higher magnetic field." Working with CERN's Knowledge Transfer (KT) Group, the team now seeks to collaborate with industrial partners who have the necessary technical expertise and market knowledge to develop the technology into a commercial product.

The CERN KT Group has recently applied for a patent on the technology to facilitate licensing to appropriate industrial partners. "Patents are valuable assets for companies and thus when seeking an industrial partner, obtaining a patent can help facilitate collaboration to take the technology to market," confirms Zoe Lawson, the technology transfer officer in the KT Group who is working with the project team. Initial talks with major companies have been very positive and the team hopes to find a suitable industrial partner in the near future.

Antonella Del Rosso

Marco Grippeling (1966-2014)

It was with great sadness that we learnt that our former colleague and friend Marco Grippeling was amongst the victims of the Malaysia Airlines crash.

Marco, a Melbourne-based cyber security specialist, boarded flight MH17 on his way back to Australia after spending his last days with friends and family in his home country of the Netherlands.

Marco joined CERN as a Technical Student in the PS Division in 1992. In 1994 he moved to the LHC Division as a Staff Member, leaving for more exotic horizons in 2000.

Marco will always be remembered for his enthusiasm and joie de vivre.

Our deepest condolences go to his family and friends at this time.

His former colleagues and friends at CERN

FROM HADRON THERAPY TO COSMIC RAYS: A LIFE IN BIOPHYSICS

In 1954 – the year CERN was founded – another scientific journey began at what is now the Lawrence Berkeley National Laboratory. Beams of protons from a particle accelerator were used for the first time by John Lawrence – a doctor and the brother of Ernest Lawrence, the physicist after whom the Berkeley lab is named – to treat patients with cancer. For many years, Eleanor Blakely has been one of the leaders of that journey. She visited CERN last week and spoke with the Bulletin about her life in biophysics.

Use of the cylcotron beam to mimic "shooting stars" seen by astronauts. Black hood on subject Cornelius Tobias keeps out light during neutron irradiation experiment at the 184-inch accelerator. Helping to position Tobias in the beam line are (left to right) John Lyman of Biomedical Division, and Ralph Thomas of Health Physics. (Photo courtesy of Lawrence Berkeley National Laboratory.)

Interested in biophysics, which was still a new field at the time, Eleanor joined the staff at Berkeley Lab in 1975. She arrived soon after the Bevatron – the accelerator where the antiproton was discovered – was linked up to the heavy-ion linear accelerator, the SuperHILAC. The combination, known as the Bevalac, could accelerate ions as heavy as uranium to high energies.

Eleanor joined the group led by Cornelius Tobias, whose research included studies related to the effects of cosmic rays on the retina, for which he exposed his own eye to ion beams to confirm his explanation of why astronauts saw unexpected light flashes during space flight. "It was a spectacular beginning, seeing my boss getting his eye irradiated," Eleanor recalls. For her own work, Cornelius showed her, in effect, a map of the energies and ranges of the different ion beams available at Berkeley. Her job as a biophysicist would be to work out which would be the best beam for cancer therapy. "I had no idea how much work that was going to be," says Eleanor, "and it's still not settled!"

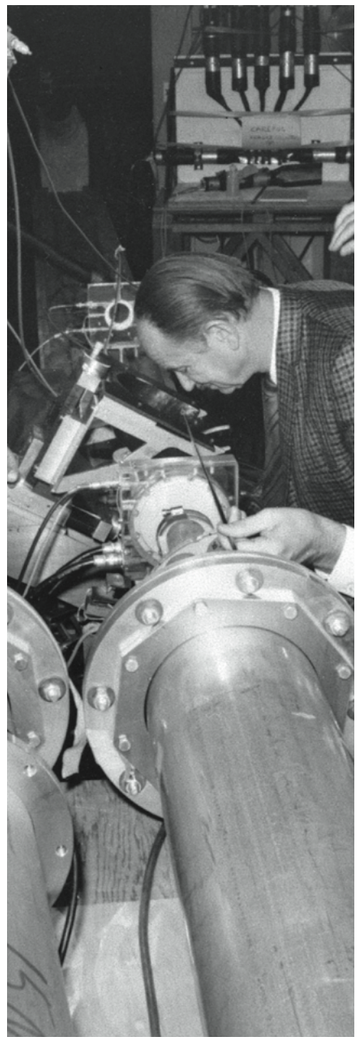
However, this early work at Berkeley showed the effectiveness of carbon and heavier ions for treating certain kinds of cancer – an important aspect of hadron therapy today.

Some of the treatments at Berkeley used a beam of helium ions directed through the lens to destroy tumours of the retina. Eleanor was devastated to learn that although the tumour was destroyed, the patients developed cataracts – a late effect of radiation exposure to the lens adjacent to some retinal tumors, requiring lens-replacement surgery. As a result, she not only proposed a more complex technique to irradiate the tumours by directing the beam though the sclera (the tough, white outer layer of the eye) instead of the lens, but also became interested in the effects of radiation on the lens of the eye – a field in which she is now a leading expert.

In 1993, the Bevalac was shut down, leaving Eleanor and her fellow researchers at Berkeley without an accelerator with energies high enough for hadron therapy. However, with her interest in irradiation of the eye, she has been able to follow her first group leader "into space" – at least as a "bench top" scientist – with studies of the effects of low radiation doses for the US space agency, NASA.

Eleanor Blakely's talk, "Reflections and Perspectives on 60 years of particle therapy" was the first talk in a new seminar series: Accelerating Innovation... in Medicine.

Christine Sutton



Bevatron Heavy-Ions Beam Group with Dr. Ed McMillan studying light flashes in nitrogen beam. (Photo courtesy of Lawrence Berkeley National Laboratory.)

INDIAN HIGH-SCHOOL STUDENTS DIVE INTO PARTICLE PHYSICS AT CERN

CERN hosted its first group of high-school students from India in a week-long programme in June, with lectures, visits and hands-on activities that brought them a little closer to the world of particle physics. Abhishek Anand, whose internship with CMS coincided with this programme, documented his experience for the CMS blog :

http://cylindricalonion.web.cern.ch

The students with CERN Director-General Rolf Heuer and Head of International Relations Rüdiger Voss.

Behind the scenes of GS

KEEPING CERN CLEAN

More than 350,000 square metres to be maintained, two different cleaning companies due to CERN's sites being in two different countries, underground installations where cleanliness is a question of safety… the CERN team in charge of supervising cleaning services overcomes all these challenges to ensure that our workplace remains clean and pleasant every day.

Ensuring the cleanliness of sites containing a huge variety of buildings is an enormous challenge for the two experts in the GS Department in charge of cleaning services. Alain Bertrand has been at CERN for 29 years and knows all there is to know about the Organization's buildings and what they are used for, the condition of their toilet facilities and, of course, the location of the border between France and Switzerland which, in terms of cleaning services, denotes the transition point between the two companies used.

David Chameaux has been doing the same job as Alain for two years, working with him to ensure that the services provided correspond to the specifications, managing tickets received via the 77777 helpdesk and finding more efficient solutions to pass on to the contractors. "The CERN site is very complex to maintain," confirms Alain. "Often, alongside normal offices, there are clean rooms, chemical laboratories and radiation protection laboratories. As well as the usual meeting rooms, there are workshops housing delicate equipment, electricity substations, tunnels where it is vitally important that no metallic waste is left behind and even offices where people are working very late!"

For the companies involved, all of this requires specialised work protocols, a variety of cleaning products and machines adapted to the huge range of types of flooring at CERN. "All of these details are included in the contracts that CERN has drawn up with the companies," explains Alain. In addition to regular cleaning, which for offices takes place once per week, the contract with the outside companies also includes standby cleaners, a schedule for deep cleaning every eight weeks and annual polishing of the floors. "The specific frequencies depend on the type of premises," explains David. "Overall, the cleaning services are improving, even if sometimes it can be a bit tricky to keep some of the older installations clean." He has a point – just as some of CERN's buildings are celebrating their 60th anniversary this year, the same is true for some of the toilet facilities!

Sometimes the cleaning service is called upon to deal with unusual situations. "From rodents hiding inside the walls of the ATLAS cavern to cleaning the gutters of the LHC, the problems are varied, but the technicians always handle them in a professional way," confirms Alain. "The work often has to be done manually and be carefully adapted to specific situations. No machine can replace our experts when, for example, an electricity substation needs cleaning and the concrete is waterlogged and slippery!"

For Alain and David, the most important thing is the satisfaction of the personnel and the thousands of users at CERN. "They should be concentrating on physics and they should be able to do so in a clean and pleasant environment. That's what we're here for!" concludes David.

If you have any comments or you are not satisfied with the cleanliness of your environment, do not hesitate to contact the cleaning service by sending an e-mail to **service-desk@cern.ch** or by calling 77777. Satisfaction surveys are also carried out to monitor quality and identify locations where improvements could be made.

For more information, go to ***http://gs-dep.web.cern.ch/en/Cleaning_Service.***

Antonella Del Rosso

Mechanised cleaning of the LHC tunnel (apron and vault).

Computer Security

TODAY'S PARANOIA, TOMORROW'S REALITY

When the Internet opened its gates to academia in the late 80s and, together with the World Wide Web a few years later, to the general public, computer security was considered somehow irrelevant. People pointing to vulnerabilities and security risks ("hackers") were labelled as paranoid. But they woke to reality during the outbreak of the "ILOVEYOU" virus in 2000, which caused large scale infections of Windows PCs (including many at CERN).

Similarly, warnings about weaknesses and insecure control systems, issued by CERN and others (see our Bulletin article "Hacking control systems, switching lights off!"), were ignored until the "Stuxnet" attack against control systems in Iran proved them right in 2010. Reality beat 'paranoia' again. Last year, the paranoid fear of many security experts that our whole IT infrastructure might have been infiltrated and spied on turned real, if you believe in the revelations of whistle-blower Edward Snowden (see "Security vs. Nations: a lost battle?"). Paranoia vs. Reality: 0-3. And the next strike is approaching…

The Internet is currently transforming away from an instrument for people sharing information to an "Internet of Things" with almost any device able to publish relevant and irrelevant data to all those who listen. Many gaming consoles and even TV sets require Internet connectivity for an "enhanced entertainment experience". So do cars, as their entertainment systems provide interfaces to communicate with your phone. In the future, they might even communicate with other cars and the next traffic light to optimise traffic flow. "SmartMeters" will measure your energy consumption at home and share this with your energy provider in real time - using the Internet. "Nest Labs" (recently acquired by Google) does the same with home air conditioning and heating. Espresso machines provide USB ports for you to upload your favourite recipes and make your "coffee experience" even better.

The paranoia? All these devices run some kind of operating system. But compared to computers or laptops, the corresponding hardware vendors do not have a real incentive to provide permanent updates and patches for them. Currently, even some smartphone manufacturers are slow to provide suitable upgrades to the firmware of their older product lines. Why should we expect better from a manufacturer of Internet-ready espresso machines or heating systems controllable from your tablet PC? Indeed, this reality has already caught up with us, as German heating systems were found vulnerable* and numerous fridges(!) where found to be sending spam messages into the world...

Conclusion? Being paranoid is not that bad. It might just mean that you're ahead of your time. At CERN, we should listen more to our intuition. Do we really have sufficient security measures in place? Is our data properly protected? Are our computing services able to fend attackers off? Is the way we do development and testing still adequate given that today everything is interconnected? When will reality enter CERN and create havoc? We're interested to know where you would invest in computer security at CERN, where to improve, and what to leave out. Just e-mail us at **Computer.Security@cern.ch**. Be paranoid!

** Subsequently, the corresponding vendor suggested affected households disconnect their Ethernet cable.*

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

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

Computer Security Team

Ombud's Corner

HOLIDAY TIME!

In July and August, the Ombud's Corner articles will be taking a holiday. They will resume in September. Meanwhile, the respect@CERN campaign continues so please keep on sending us your suggestions.

As announced in the last Bulletin, "We want these initiatives to belong to you. For this reason, we would like to ask you to suggest 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** – and of course we will reward the authors with exclusively designed 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 e-mail now!"

Sudeshna Datta-Cockerill

NEW PROCEDURE FOR DECLARING CHANGES IN FAMILY AND PERSONAL SITUATION

On taking up their appointment, Members of the Personnel (employed and associated) are required to provide official documents as evidence of their family situation. Any subsequent change in their personal situation, or that of their family members, must be declared in writing to the Organization within 30 calendar days.

As part of their efforts to simplify procedures, the Administrative Processes Section (DG-RPC-PA) and the HR and GS Departments have produced a new EDH form entitled "Change of family and personal situation", which must be used to declare the following changes:

- birth or adoption of a child;
- marriage;
- divorce;
- entry into a civil partnership officially registered in a Member State;
- dissolution of such a partnership;
- change of name;
- change of nationality or new nationality.

Members of the Personnel must create the form themselves and provide the information required for the type of declaration concerned, indicating, if applicable, any benefit from an external source that they or their family members are entitled to claim that is of the same nature as a benefit provided for in the Organization's Staff Regulations. They must also attach a scan of the original certificate corresponding to their declaration.

The form is sent automatically to the relevant Departmental Secretariat, or to the Users Office in the case of Users, Cooperation Associates and Scientific Associates, and is then handled by the services within the HR Department. The Member of the Personnel receives an EDH notification when the change in personal status has been recorded.

The information recorded remains confidential and can be accessed only by the authorised administrative services.

N.B.: If allowances and indemnities paid regularly are affected, the next payslip constitutes a contract amendment. In accordance with Article R II 1.15 of the Staff Regulations, Members of the Personnel are deemed to have accepted a contract amendment if they have not informed the Organization to the contrary within 60 calendar days of receiving it.

Further information can be found on the 'Change of family situation' page of the Admin e-guide: **https://admin-eguide.web.cern.ch/admin-eguide/famille/proc_change_famille_en.asp**

Any questions about the procedure should be addressed to your Departmental Secretariat or the Users Office.

If you encounter technical difficulties with this new EDH document, please e-mail **service-desk@cern.ch**, explaining the problem.

The Administrative Processes Section (DG-RPC-PA).

REMINDER: BIKE SAFETY – E-LEARNING MODULE STILL AVAILABLE!

The course, which takes around 10 minutes to complete, can be accessed via the SIR application. It presents safety information, such as the road traffic rules, and practical advice, such as the appropriate safety equipment to wear and to have fitted to your bike.

Regarding the rules, we would like to remind you that CERN's Safety Code A7 applies to cyclists as well as motorists.

The training module was created by the accident prevention service of the HSE Unit after it was noticed that the number of occupational accidents involving cyclists had been constantly increasing since 2008, with a rise from about 20 in 2009 to about 50 in 2013.

Since its launch in September 2013, the course has been taken by more than 670 people. It can be completed at any time, in either English or French.

The Safety Training Section will be happy to answer any questions relating to this module or any other safety training course (contact: safety-training@cern.ch).

For any questions about accidents at CERN, contact: **accident-inventory-admins@cern.ch**

HSE Unit

RESTAURANT CLOSURES: SUMMER 2014

Restaurant 2

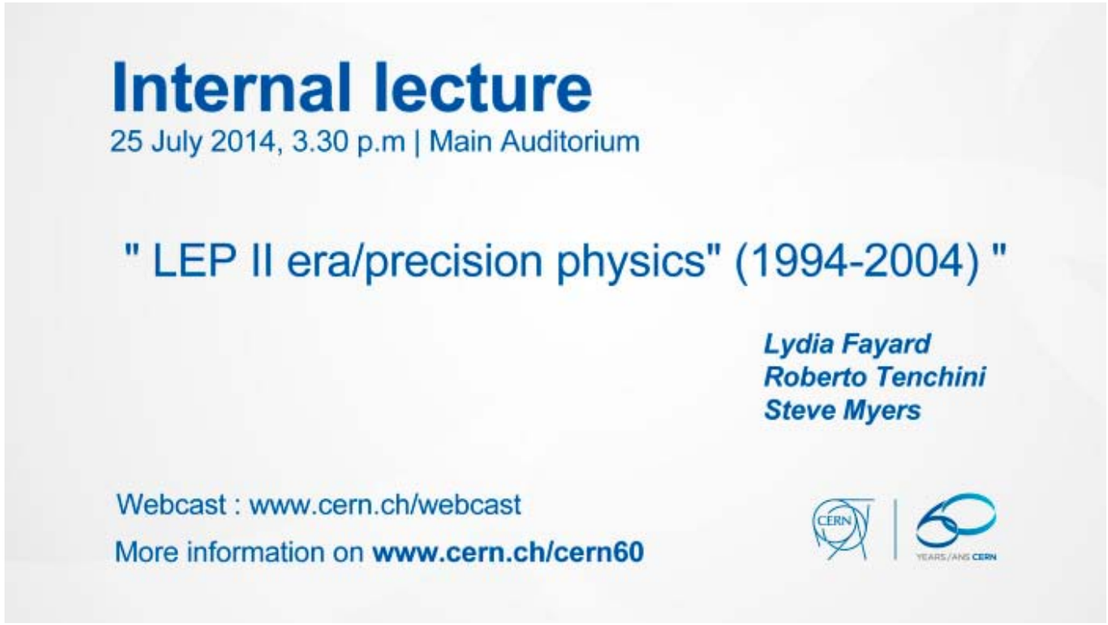
- Table service/brasserie: closed from Monday 28 July to Friday 12 September (open upon reservation for groups of 20+)

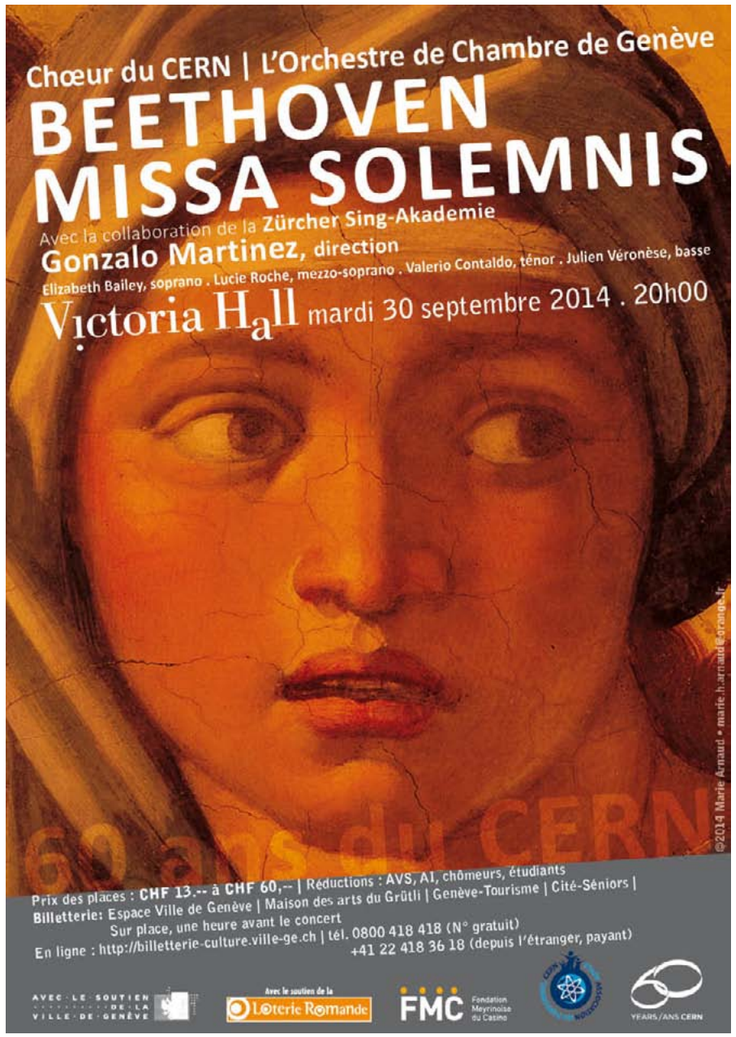
Snack bars

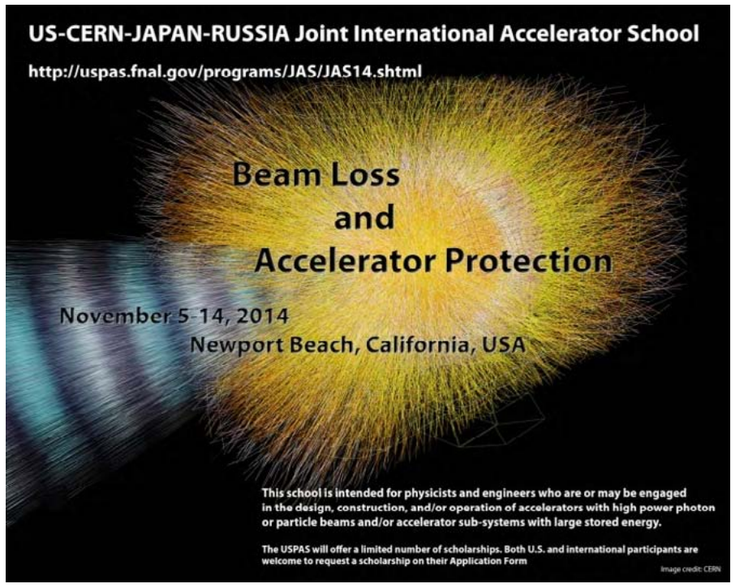
- Bldg. 54: closed from Monday 7 July to Friday 12 September (self-service Nespresso machine available)
- Bldg. 40: closed every day at 4.30 p.m instead of 5 p.m. from Monday 7 July to Friday 12 September

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 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

CERN LIBRARY | MICHAEL DITTMAR PRESENTS "EXTRACTED: HOW THE QUEST FOR MINERAL WEALTH IS PLUNDERING THE PLANET" BY UGO BARDI (ET AL.) | 24 JULY

As we dig, drill and excavate to unearth the planet's mineral bounty, the resources we exploit from ores, veins, seams and wells are gradually becoming exhausted. Mineral treasures that took millions, or even billions, of years to form are now being squandered in just centuries—or sometimes just decades.

Extracted: *How the Quest for Mineral Wealth Is Plundering the Planet*, by Ugo Bardi et al., Chelsea Green Publishing, 2014, ISBN 9781603585415.

Will there come a time when we actually run out of minerals? Debates already soar over how we are going to obtain energy without oil, coal and gas. But what about the other mineral losses we face? Without metals, and semiconductors, how are we going to keep our industrial system running? Without mineral fertilisers and fuels, how are we going to produce the food we need?

Ugo Bardi delivers a sweeping history of the mining industry, starting with its humble beginning when our early ancestors started digging underground to find the stones they needed for their tools. He traces the links between mineral riches and empires, wars and civilizations, and shows how mining in its various forms came to be one of the largest global industries. He also illustrates how the gigantic mining machine is now starting to show signs of difficulties.

Michael Dittmar wrote a chapter on "The End of Cheap Uranium".

Thursday 24 July 2014 at 4 p.m.
in the Library, Bldg. 52-1-052
https://indico.cern.ch/event/331196/

Coffee will be served from 3.30 p.m.

Training

A BREATH OF FRESH AIR FOR CRYOGENICS TRAINING

Whether you work full-time in a cryogenic installation or are required to handle cryogenic substances temporarily, you need to have followed the appropriate safety training.

Two new training courses are now available in English and French at CERN: "Cryogenic Safety – Fundamentals" (at the Prévessin Training Centre) and "Cryogenic Safety – Helium Transfer" (at the Cryolab).

The first covers the content of levels 1 and 2 of the old "Cryogenic Safety" course. The second is a completely new course for CERN: it covers specific aspects of the transfer of liquid helium, such as the evaporation process of helium and the associated risks to human health (asphyxia due to displacement of oxygen), the colour code for gas bottles, etc. These training modules have been rewritten in response to the increase in the number of projects involving cryogenics and following various related incidents.

Both courses are taught "face to face" by Torsten Koettig, an engineer from the TE Department, and include a theoretical section and a practical section. In order to be able to take the "Helium Transfer" module, you must have already completed the "Fundamentals" module.

If you have any questions about cryogenic safety, please contact your Cryogenic Safety Officer (CSO). If your Department does not have a CSO, please address your questions to the HSE Unit: **hse.secretariat@cern.ch.**

HSE Unit

Photo : Christoph Balle.

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Seminars

FRIDAY JULY 25, 2014

- 09:00 **International School of Physics "Enrico Fermi" Grid and Cloud Computing – Concepts and Practical Applications - 2014**

MONDAY JULY 28, 2014

- 09:15 Summer Student Lecture Programme **Course Future Collider Technologies (1/2) Linear Machines** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Search for BSM Physics at had. Colliders (1/3)** Main Auditorium
- 11:15 Summer Student Lecture Programme **Course Radiobiology of Particle Beams (1/1)** Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session** Main Auditorium

TUESDAY JULY 29, 2014

- 09:15 Summer Student Lecture Programme **Course Future Collider Technologies (2/2) Linear Machines** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Search for BSM Physics at had. Colliders (2/3)** Main Auditorium
- 11:15 Summer Student Lecture Programme **Course Flavour Physics and CP Violation** (1/4) Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session** Main Auditorium
- 14:00 **TH String Theory Seminar TBA**

WEDNESDAY JULY 30, 2014

- 09:15 Summer Student Lecture Programme **Course Nuclear Physics (1/3)** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Flavour Physics and CP Violation (2/4)** Main Auditorium
- 11:00 **Computing Seminar Kinetic: Redefining Storage for Massive Scale IT** Amphitheatre
- 11:15 Summer Student Lecture Programme **Course Search for BSM Physics at had. Colliders (3/3)** Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session Main** Auditorium
- 14:00 **TH Theoretical Seminar No TH Seminar** (Lattice Gauge Theory Institute)

THURSDAY JULY 31, 2014

- 09:15 Summer Student Lecture Programme **Course Nuclear Physics (2/3)** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Flavour Physics and CP Violation (3/4)** Main Auditorium
- 11:00 **Collider Cross Talk No cross talk**
- 11:15 Summer Student Lecture Programme **Course Particle Accelerators in Cancer Therapy (1/2)** Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session** Main Auditorium
- 14:00 **TH BSM Forum no seminar** [lattice event]

FRIDAY AUGUST 01, 2014

- 09:15 Summer Student Lecture Programme **Course Nuclear Physics (3/3)** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Flavour Physics and CP Violation (4/4)** Main Auditorium
- 11:15 Summer Student Lecture Programme **Course Particle Accelerators in Cancer Therapy (2/2)** Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session** Main Auditorium

SUNDAY AUGUST 03, 2014

- 08:00 **African School of Fundamental Physics ASP2014**
- Monday August 04, 2014
- 09:15 Summer Student Lecture Programme **Course String Theory** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Physics at Future Colliders (1/2)** Main Auditorium
- 11:15 Summer Student Lecture Programme **Course Antimatter in the Lab** (1/3) Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session** Main Auditorium
- 17:30 **SLAC Summer Institute 42nd SLAC Summer Institute** Kavli Auditorium

TUESDAY AUGUST 05, 2014

- 09:15 Summer Student Lecture Programme **Course Introduction to Cosmology (1/3)** Main Auditorium
- 10:15 Summer Student Lecture Programme **Course Physics at Future Colliders (2/2)** Main Auditorium
- 11:15 Summer Student Lecture Programme **Course Astroparticle Physics (1/3)** Main Auditorium
- 12:00 Summer Student Lecture Programme **Course Discussion Session** Main Auditorium