CERN Bulletin

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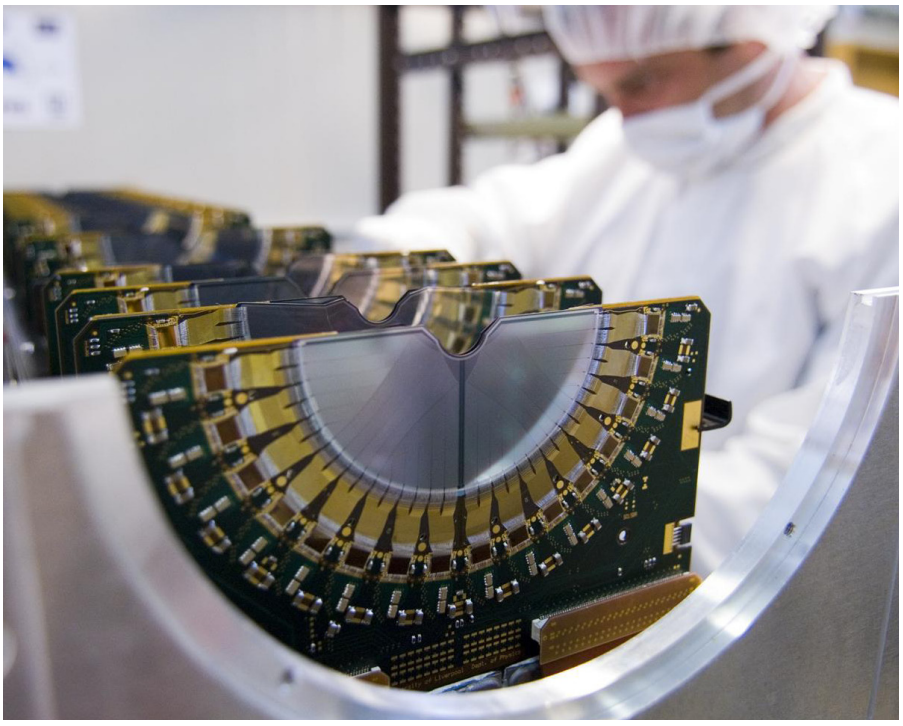
A new "culprit" for matter-antimatter asymmetry



The VELO detector: a crucial element for particle identifiation in LHCb.

In our matter-dominated Universe, the observation of new processes showing matter-antimatter asymmetry allows scientists to test their theories and, possibly, to explore new territories. The LHCb collaboration has recently observed matter-antimatter asymmetries in the decays of the B^0_s meson, which thus becomes the fourth particle known to present such behaviour.

Almost all physics processes known to scientists show perfect symmetry if a particle is interchanged with its antiparticle (C symmetry), and then if left and right are swapped (P symmetry). So it becomes very hard to explain why the Universe itself does not conform to this symmetry and, instead, shows a huge preference for matter. Processes that violate this symmetry are rare and of great interest to scientists.

Violation of the CP symmetry in neutral kaons was first observed by Nobel Prize Laureates James Cronin and Val Fitch in the 1960s. About 40 years later, another particle, the B^0 meson (composed of a bottom

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Our Universe is yours

It seems that every year is an important year for CERN, and this year is no exception. The LHC's first long shutdown (LS1) is, of course, the focus of activities, but 2013 is also an opportunity for us to showcase our facilities to the public, to the media, to decision makers and to our neighbours. I'm aware that the number of visitors coming to CERN is already breaking

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News

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Our Universe is yours

records, and I'd like to thank everyone for the efforts you are making to accommodate them while the LS1 work is going on.

The people of the Geneva region have hosted CERN for almost 60 years, and we have become an important part of the local community. That's a big responsibility, and over recent years we have been reinforcing our engagement with the local region through dedicated programmes for primary schools, high schools and teachers and an annual information session for the local and international community.

An important part of this initiative is the Passport to the Big Bang scientific tourism project, which we have built up with our partners in the Pays de Gex and Geneva, and which will be launched on 2 June with a series of group cycle rides for all ages taking in some of the Passport to the Big Bang sites. Later in the year in September, we'll be opening our doors to the public in what promises to be CERN's biggest open day weekend ever. You can read more about both these events in the previous issue of the Bulletin and you'll have already received the call for volunteers.

In my message this week, it's that call that I'd like to reinforce. The message we want to pass to our visitors on our open days, and at the inauguration of Passport to the Big Bang, is that 'Our Universe is yours'. To make that true, however, we need your help, and I encourage you to sign up. I have taken part in many such events at CERN in the past, I have always found them to be extremely rewarding, and I will be on duty again this year. I look forward to seeing many of you there, sharing your passion with our neighbours and visitors from further afield.

Rolf Heuer

A new "culprit" for matter-antimatter asymmetry

(Continued from page 1)

antiquark and a down quark), showed similar behaviour in the BaBar detector at SLAC in the US and in the Belle detector at KEK in Japan. In more recent experiments at the B factories and the LHCb experiment at CERN, the B^+ meson (made of a bottom antiquark and an up quark) was also found to demonstrate behaviour different to that of its corresponding antiparticle.

Today, the LHCb collaboration has discovered asymmetric behaviour in the B^0_s particle (a bottom antiquark and a strange quark). "We have analysed a data sample corresponding to an integrated luminosity of 1 inverse femtobarn collected by the experiment in 2011," explains Pierluigi Campana, Spokesperson of the LHCb collaboration. "Previous experiments installed at dedicated B factories and at the Tevatron were not in a position to accumulate large enough B^0_s decay samples. Thanks to the LHC statistics and the LHCb detector particle identification capabilities, CP violation in the $B^0_s \to K^-\pi^+$ decay has been observed for the first time with a significance of more than 5 sigma."

All these CP violation phenomena can be accounted for in the Standard Model theory incorporating the Cabibbo-Kobayashi-Maskawa (CKM) mechanism of quark-flavour mixing, though some interesting discrepancies demand more detailed studies. "From the same theory we also know that the total effects induced by Standard Model CP violation are too small to account for the matter-dominated Universe," Pierluigi Campana concludes. "By studying CP violation effects we are looking for the missing pieces of the puzzle, which provide stringent tests of the theory and are a sensitive probe for revealing the presence of non-Standard Model physics."

Antonella Del Rosso

LS1 Report: working night and day

In the LHC tunnel, the first underground activities of the SMACC (Superconducting Magnet And Circuit Consolidation) project have begun. In sector 5-6, the opening of the W bellows, which form the outer shell around the circuit connections between each of the cryo-magnets, is underway.

By 15 April, 22 interconnection bellows had been opened. Elsewhere in the LHC, the warming up of the different sectors to room temperature continues. Sector 4-5 should be at room temperature by the end of April, with sector 6-7 not far behind.

At the SPS, 16 magnets (12 dipoles and 4 quadrupoles) have been removed from the machine. These magnets will be equipped with specially coated vacuum chambers in order to measure the effectiveness of this coating in reducing the build-up of electron cloud phenomena around the LHC beam during acceleration in the SPS.

The removal of the old ventilation system in the PS tunnel continues. This work will continue throughout 2013 and will cover all of the eight PS tunnel ventilation rooms. So far, the work is concentrated at points 6 and 8, where around 80% of the old ventilation system has been removed. Work is planned to start at points 1 and 2 next week. As the original ducts contain traces of asbestos, this dismantling is performed in special sealed tents, which have been installed inside the PS. These tents are designed to avoid the possibility of any contamination from the rest of the tunnel.

On top of the daytime work, last week teams of magnet experts were working overnight to complete a number of important electrical tests on the PS magnets. This work is done at night so as not to impact the progress of the shutdown activities in the tunnel. Such tests are vital at the start of a long shutdown, as they allow the magnet specialists to identify potentially weak elements, which are then changed during the shutdown as part of the preventive maintenance programme.

In building 193 (the AD Hall) preparations for the construction of the new annex to the AD Hall, which is part of the ELENA project, are complete. Many DC and control cables have been re-routed to allow the construction work on the new building to start in May.

Simon Baird

A train for the bus(bars)

On 8 April, the first SMACC (Superconducting Magnets and Circuits Consolidation) teams began work in the LHC tunnel. They are responsible for opening the interconnects between the magnets, laying the groundwork for the series of operations that will be performed by the team riding the 'consolidation train'.

A technician installs the machine tool that allows them to prepare the surface of the section of the bar where the shunt will be fixed.

The LHC's 1,670 dipoles and quadrupoles are powered by power converters and connected by copper 'busbars'. The superconducting cables run through these bars, carrying a current of up to 11,850 amps. Six superconducting cables meet at each interconnect, where they are held together by a soldered (see box) electrical connection sandwiched between two pieces of copper, forming the splice between the busbars of the neighbouring magnets. The integrity of the electrical circuit is dependent on the quality of these solders; a weak solder can cause a discontinuity leading to an electric arc, which can have serious consequences.

In order to avoid this kind of problem, the SMACC project was launched in 2009. Its main objective is to install a shunt – a small copper plate 50 mm long, 15 mm wide and 3 mm thick – on each splice, straddling the main electrical connection and the busbars of the adjacent magnets. In this way, should a quench occur in the superconducting cable, the current will pass through the copper part, which must therefore provide an unbroken path.

"Several teams will be working on the chain, each occupying a car in the 'consolidation train'," explains Frédéric Savary from TE-MSC. "Each team comprises several technicians so that they can work on a number of interconnects in parallel. The team at the front of the train will open the lines containing the electrical connections by using special machines to cut the welds of the cylindrical sleeves that form the mechanical and hydraulic links between two magnets." The team in the next car will then remove the electrical insulation that protects the circuit before using a machine tool developed by the MSC Group to prepare the surface of the section of the bar where the shunt will be fixed. In total, more than 27,000 shunts will have to be put in place, an average of one every three minutes.

The engineers have performed full-scale tests to verify the efficiency of the shunts. "We tested a set of two magnets connected in series at 4.5 K on a measurement bench in SM18," Savary tells us. "We intentionally used poor connections between the busbars of the two magnets, leaving a gap of 8 mm between the copper parts. We put the shunts in place and then ran a current of 14,000 amps through the circuit - that's much higher than the LHC's nominal current of 11,850 amps - and we caused quenches." Everything went just as expected: the current successfully passed through the alternative route created by the shunt.

CERN Bulletin

The copper bars between two magnets at an interconnection.

Soldering

Soldering is a permanent assembly process that creates an uninterrupted metallic link between two objects. It involves extending a metal or alloy from one of the edges to be fixed to the other using heat and/or mechanical methods. Unlike welding, the edges of the two pieces are not fused together. The solders on the main electrical connections of the LHC use a tin-silver alloy, which requires a temperature of 221°C to fuse. The shunts are soldered using a tin-lead alloy with a fusing temperature of 183°C, ensuring that the solder on the main connection does not melt again during the installation of the shunt.

A new awakening for accelerator cavities

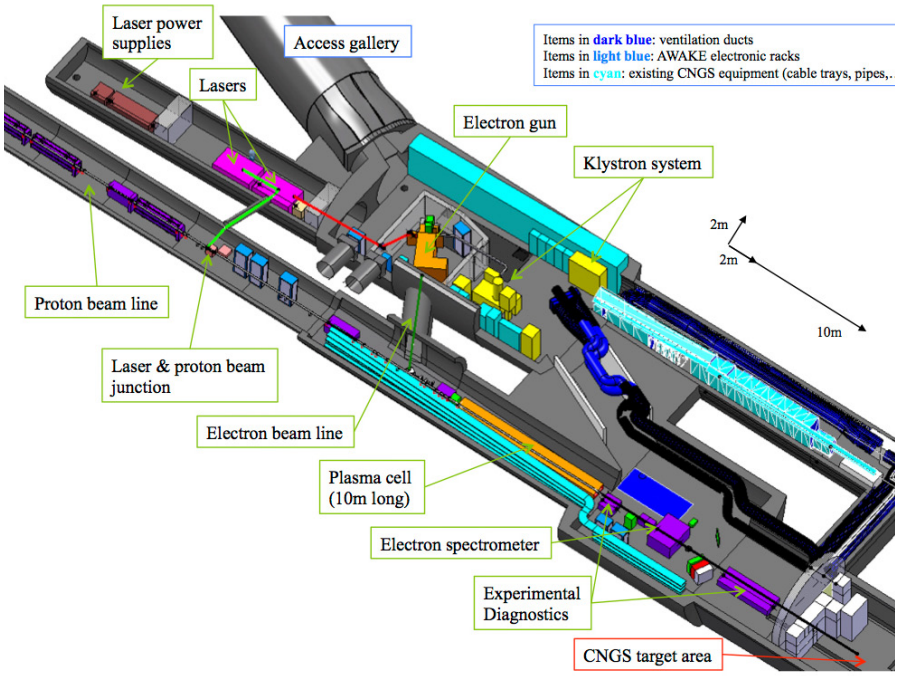
Imagine: an accelerator unbound by length; one that can bring a beam up to the TeV level in just a few hundred metres. Sounds like a dream? Perhaps not for long. At CERN's Proton Driven Plasma Wakefield Acceleration Experiment (AWAKE), physicists may soon be working to bring this contemporary fairy-tale to life.

Wherever you find a modern linear particle accelerator, you'll find with it a lengthy series of RF accelerating cavities. Although based on technology first developed over half a century ago, RF cavities have dominated the accelerating world since their inception. However, new developments in plasma accelerator systems may soon be bringing a new player into the game. By harnessing the power of wakefields generated by beams in plasma cells, physicists may be able to produce accelerator gradients of many GV/m – hundreds of times higher than those achieved in current RF cavities.

"Plasma wakefield acceleration has already been demonstrated at other laboratories, where electron-driven systems have generated gradients of 50 GV/m," says Edda Gschwendtner, CERN AWAKE project leader. "AWAKE plans to achieve very high gradients by using a proton-driven plasma wakefield system. This experiment can only be performed at CERN, as it requires the use of high-energy proton beams available here."

The physics behind the AWAKE project can be found in its recently published design report: As a proton beam (known as the "drive" beam) is injected into a plasma cell it attracts free electrons in the plasma. These free electrons "overshoot" the proton beam but are attracted back by free ions also in the plasma. These oscillating electrons create what could be described as a "naturally occurring" RF cavity: an accelerating electric field in the plasma through which the next beam (known as the "witness" beam) passes and gets accelerated.

If approved, the AWAKE experiment will use 400 GeV SPS beams for its drive beam. "We performed detailed studies of the best suited location for the AWAKE experiment, and in the recently published design report we propose the re-use of the CNGS facility," says Edda Gschwendtner. "We will extract an LHC-type 400 GeV proton bunch from the SPS and send it towards a plasma cell. A laser pulse, coincident with the proton bunch, will ionize the (initially neutral) gas in the plasma cell, form a plasma and also seed the proton bunch self-modulation (see box). An electron beam will serve as the witness beam and will be accelerated in the wake of the proton bunches. Several diagnostic tools will have to be installed in the experimental area in order to measure the proton bunch self-modulation effects. A state of the art magnetic spectrometer is installed downstream of the plasma cell to measure the electron bunch properties."



Integration of the AWAKE experimental components in the experimental area.

While the potential is certainly there, there is still a lot to learn about plasma wakefield technology. Protons have never been used for this type of acceleration (AWAKE would be the first) nor has the effect of the beam self-modulation effect on the creation of the accelerating gradient been measured. "It is important to remember that AWAKE will be an accelerator R&D proof-of-principle experiment," concludes Edda. "We first aim to verify this novel concept before we consider its applications in accelerator projects."

Katarina Anthony

Self-modulation of proton beams

Generating a high electric field in a plasma wakefield acceleration system requires short, densely packed proton beams (order of ~mm). However, as the SPS generates beams with bunch length of more than 10 cm, AWAKE will have to take advantage of the effect known as "self-modulation".

Self-modulation occurs when long bunches of particles enter a plasma. Instead of travelling through the plasma as a single bunch, it evolves into several mini-bunches spaced at the wavelength of the plasma. This effect provides AWAKE with the short bunches required to create the accelerating gradient. However, as this is a naturally occurring effect, it needs to be controlled. Consequently, AWAKE will use a laser pulse to seed the self-modulation effect in the proton beam to ensure the witness beam is perfectly in phase with the accelerating electric field in the plasma.

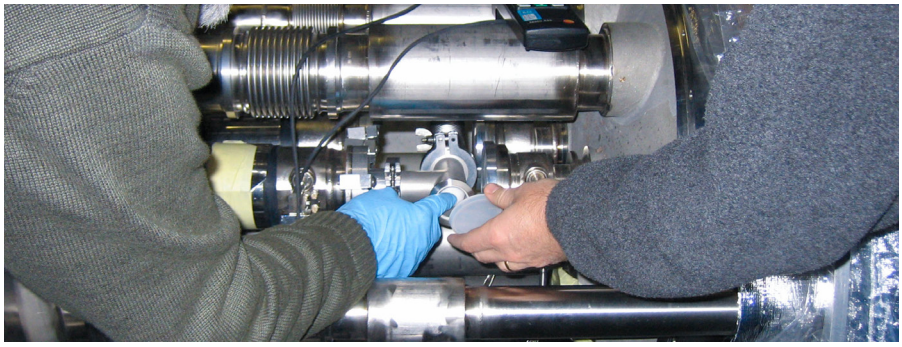
Prepare to be blown away

On 16 April, the TE-VSC team began identifying and repairing the LHC's faulty radiofrequency fingers. Their main tool: an "RF ball" that will be – quite literally – blown through the beam pipe.

In the bellows of the LHC interconnects, you'll find the vacuum pipe held together by some flexible metallic connectors known as "RF fingers". These RF fingers maintain the electrical contact between the LHC magnets, ensuring the continuity of the beam pipe. As the magnets contract and expand when heated up and cooled down, the fingers preserve their connection by simply sliding over each other.

However, experience has shown that the movement of the LHC magnets can cause the fingers to buckle. "It's not a question of bad design," explains Vincent Baglin, from TE's Vacuum, Surfaces and Coatings (TE-VSC) group. "Rather, there were slight non-conformities during construction which resulted in some of the fingers not meeting the design parameters." These faulty fingers can be easily fixed – but with over 1,800 RF fingers in the LHC and with no information as to how much each RF bridge conforms, finding them is the real challenge.

Answering the call to action: the TE-VSC team. Over the next two months, they will be examining the entire machine for faulty RF fingers using the so-called 'ball-test' technique.* "We will be pumping an RF ball – a simple sphere with a radiofrequency emitter in it – through the beam pipe in search of irregularities," says Julien Finelle, technician in charge of the tests. "As the machine is being warmed up to room temperature, the faulty fingers will buckle into the beam pipe. These fingers will then block the RF ball as it makes its way through the pipe, allowing us to identify the sectors requiring repair."



RF ball tests carried out in 2007.

Finelle's team will be testing the machine arc by arc, using a simple aspiration technique to "blow" the RF ball through the beam pipe. "We will open the arc extremity, attach aspiration equipment, insert the RF ball and blow," explains Julien Finelle. "Marek Gasior's team (from BE-BI) have beam position monitors in place every 52 metres, which monitor the progress of the RF ball through the machine." If there are no faulty fingers, the tests can be completed in just over 20 minutes. Where there is a problem identified, Nicolas Bourcey's team (from TE-MSC) will cut into the machine and we will repair the fingers.

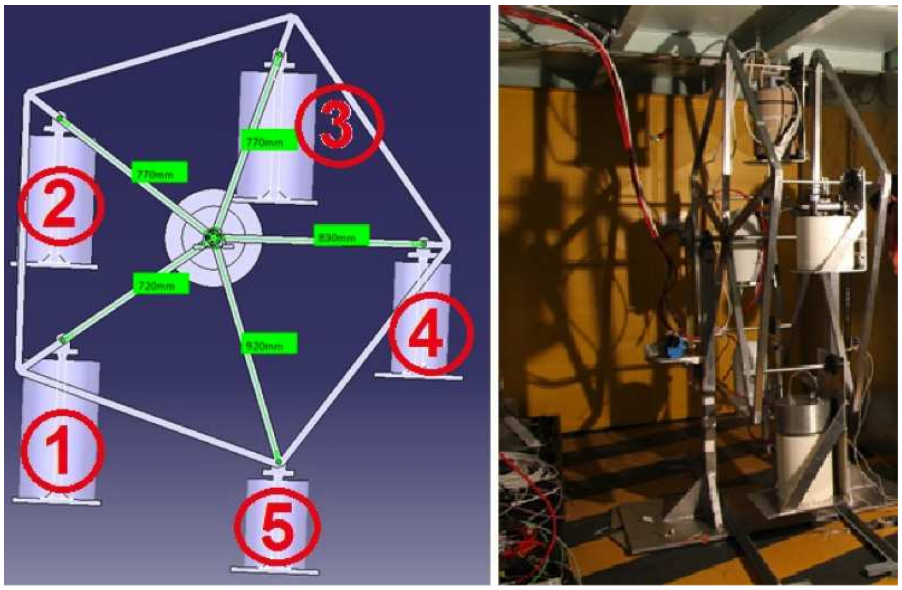
Katarina Anthony

** Developed in 2008 by members of BE-BI, BE-RF, DG-DI, EN-MEF, PH-UIS and TE-VSC.*

Detectors that don't fear neutrons

High-intensity pulsed neutron fields are produced at particle accelerators such as CERN's PS and LHC. The efficient detection of this stray pulsed radiation is technically difficult and standard detectors show strong limitations when measuring such fields. A new test performed at the HiRadMat facility has recently shed light on the performance of various neutron detectors exposed to extreme conditions.

High-intensity pulsed neutron fields are among the toughest conditions a detector can be asked to face. Particle accelerators produce such stray radiation when primary beams are dumped or lost because of, for example, an orbit instability that can occur during ordinary operation. Accurately measuring the radiation levels is the first requirement in order for experts to be able to effectively protect personnel and the environment. "Due to the constraints of the electronics, building detectors that can stand high-intensity pulsed neutron fields is a technical challenge," says Marco Silari, member of CERN's Radiation Protection group and project leader of the HRMT-15 RPINST experiment. "Most detectors suffer from particle pile-up and the read-out becomes meaningless. In some cases, algorithms are used to compensate for losses due to high-intensity pulses but they usually do not give reliable results."



In order to limit the required human intervention to the beginning and the end of the test, detectors were mounted on a dedicated wheel that CERN's HiRadMat team built for the HRMT-15 experiment.

The HRMT-15 experiment recently measured the performance of five neutron detectors exposed to the neutron flux produced when high-energy protons from the SPS are stopped in the HiRadMat dump installation. "HiRadMat is a unique facility that has allowed us to expose the detectors to extremely intense neutron fluxes that hit them in very short pulses," explains Marco Silari. "The intensity of the primary proton beam from the SPS has been varied over four orders of magnitude up to about 10^{13} protons per bunch. These are extremely tough conditions for the detectors. Among the five we tested, only three of them passed the test while the others showed significant signs of failure."

Among the detectors that passed the test with flying colours are two of the RAMSES detectors, which are installed all around the LHC tunnel, in service caverns of the LHC experiments and all along the LHC injector chain, and constantly monitor the radiation levels in the machine. "We also tested LUPIN, a new detector prototype developed by the Energy Department of Politecnico di Milano (Italy) in collaboration with CNAO, the Italian Centre for Hadrontherapy," adds Giacomo Manessi, PhD student in the Radiation Protection group. "LUPIN's performance was excellent, thus also making it a suitable detector for medical accelerators."

The HRMT-15 Collaboration, whose work was partially supported by EuCARD HiRadMat transnational access, is about to publish the detailed results of the test in Nuclear Instruments and Methods in *Physics Research Section A*.

Antonella Del Rosso

Increasing the potential

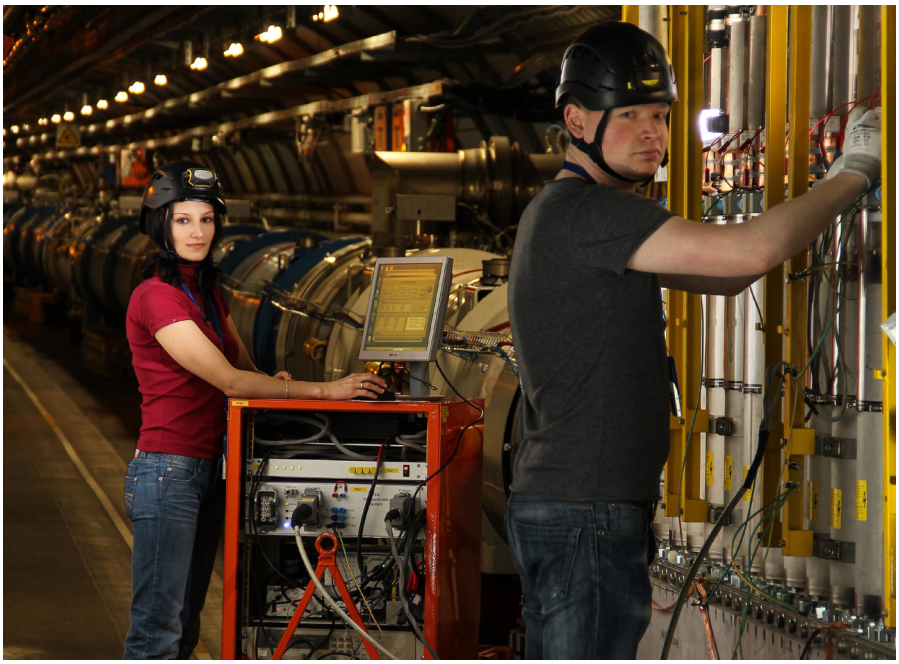
Electrical quality assurance testing (ELQA) of the LHC's superconducting circuits is currently underway in sector 3-4 of the machine. The rigorous examination by the ELQA team covers secondary circuits as well as the main magnets.

The LHC's superconducting magnets are connected in 1,612 electrical circuits, supplied from 52 electrical distribution feedboxes (DFBs) via no fewer than 3,286 current leads. Were you to add up the electrical currents fed into all the magnets through the current leads, in nominal accelerator operation, you would get 3.3 million amps. The LHC is, above all, a giant electrical installation. This is why quality assurance testing of the electrical systems is so important.

The ELQA team have been operating in the tunnel since 22 February. Their job is to test all the electrical circuits of the superconducting magnets and to certify their readiness for operation at high energy - 7 TeV per beam. "We're testing the electric circuits of the magnets and the instrumentation. We do this by measuring their electrical parameters, including electrical continuity checks and tests of the insulation against earth," explains Giorgio D'Angelo, an ELQA project engineer. As part of the testing, the ELQA team applies a high electrical potential to the circuits and checks that the resulting readings are within the specifications. "If we get an unexpected result, we continue troubleshooting until we find out exactly where the problem lies," adds D'Angelo.

A healthy electrical system is absolutely indispensable, as the slightest short-circuit, for example, could lead to a major breakdown and seriously damage the magnets. Of course, each circuit is also fitted with a protection system. In the event of a quench during operations, the protection system takes over, discharging the accumulated energy and bringing the current down to zero.

All these tests need to be done first on the machine in a cold state, corresponding to actual operating conditions in the LHC, and then on the machine warmed up to normal ambient temperature. This is because the LHC, when it goes from 1.9 to 300 Kelvin (see the article "Heatwave warning for the LHC" in Bulletin 12-14/2013), experiences thermal expansion, which can damage the electrical system. Also during Long Shutdown 1 (LS1), eighteen magnets (15 dipoles and 3 quadrupoles) will be replaced. Once they have been installed and connected, these will need to be thoroughly tested – another job for the ELQA team.



ELQA tests are performed in sector 4-5 of the LHC tunnel. The mobile platform (in the cart) was developed in collaboration with IFJ-PAN to test the LHC magnet circuits; it has been upgraded at the Institute especially for LS1.

Another ELQA project engineer, Jaromir Ludwin, notes that: "For LS1, 25 experts from the Henryk Niewodniczański Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ-PAN) have come on board to bolster CERN's ELQA team. CERN's collaboration with IFJ-PAN – which trains electrical QA experts – dates back to 2005. Engineers from the institute were on hand during the construction of the LHC, and the expertise they have developed will be indispensable to the ELQA testing programme during LS1."

So far, cold tests have been done in sectors 1-2, 2-3, 4-5, 5-6, 6-7, 7-8 and 8-1. Testing should be completed by the end of April, when it will be time to restart the cycle, but this time at ambient temperature.

Anaïs Schaeffer

High-powered manoeuvres

This week, CERN received the latest new transformers for the SPS. Stored in pairs in 24-tonne steel containers, these transformers will replace the old models, which have been in place since 1981.

During LS1, the TE-EPC Group will be replacing all of the transformers for the main converters of the SPS. This renewal campaign is being carried out as part of the accelerator consolidation programme, which began at the start of April and will come to an end in November. It involves 80 transformers: 64 with a power of 2.6 megavolt-amperes (MVA) for the dipole magnets, and 16 with 1.9 MVA for the quadrupoles.

These new transformers were manufactured by an Italian company and are being installed outside the six access points of the SPS by the EN-HE Group, using CERN's 220-tonne crane. They will contribute to the upgrade of the SPS, which should thus continue to operate as the injector for the LHC until 2040.

Anaïs Schaeffer

The transformers arrive at SPS's access point 4 (BA 4).

Stress and back pain: we're all concerned!

On 18 April, CERN celebrated the World Day for Safety and Health at Work. This event was organised by the Safety Unit of the BE Department, the HSE Unit, the Medical Service and the Fire Brigade for the third year running.

Information stands on the themes of stress and back pain were set up in each of CERN's three restaurants and attracted more than 260 people, including CERN's Director-General.

Stress self-evaluation, anti-stress techniques, tips for avoiding and managing back pain… all aspects of these everyday afflictions were addressed. The participants, most of whom were directly affected by these problems, had their many questions answered at the stands.

The organisers would like to thank all of the volunteers who made this day a success.

Here are the results of the "back pain" competition:

1st prize: Antti Lindqvist (HR), who wins a "Relaxing Massages" SmartBox gift experience.

2nd prize: Benoit Riffaud (EN), who wins a €50 Vitam'Parc voucher.

3rd prize: Emilien Leblond (TE), who wins a €30 Vitam'Parc voucher.

Anaïs Schaeffer

The mannequin demonstrates how different positions require different effort to carry the same load: the first by curving the back (which places more strain on the spine), and the other by bending the knees (a good technique to reduce strain).

Computer Security
Sécurité informatique

Android is the new Windows

Do you recall the early virus attacks in the early 2000s? "Blaster", "I love you" and "Slammer" were attacking the pretty much unprotected Microsoft Windows operating system.

While Microsoft has been hit hard in the past, they have tried to improve and are now on a par with other software vendors. Today, they can even be happy that Android is taking over the baton - at least on mobile platforms.

According to the Sophos 2013 Security Threat Report "Android [is] today's the biggest target" and Android devices in Australia and the U.S. experienced even more malware attacks, whether successful or unsuccessful, than PCs during the past three months. The Kaspersky security company recently added that 99% of all mobile threats target Android. Lucky you if you use an iPhone, or a good old Nokia with no Internet connectivity at all.

But why is that? It is partly down to the same factor that affected Microsoft in the past: market share. More than 50% of all mobile devices run the Android operating system. In addition, the Android app market is heterogeneous and uncontrolled – the complete opposite of Apple's central iTunes app store. This heterogeneity makes it easy for attackers to publish and distribute their malicious apps. However, one of the main reasons, according to Katja Locker of SWITCHcert, is that only 10% of all devices are running the newest version of Android called "Jelly Bean". "Gingerbread", which is two years old, still powers over 47% of all devices. She quotes IT expert Michael Kroker saying that this isn't the users' fault though – over the past 24 months, Google has "failed to hold manufacturers and providers accountable and get them to convince their customers to update." In comparison, Apple's iOS6 had a 60% conversion rate just one month after release.

So how can you improve? Obviously, running or updating to the latest version of Android ("Jelly Bean", version 4.2) helps. If you can't do that, be careful when installing apps. Only download apps from a location or store that you trust. Beware of malicious URLs and QR codes (see our Bulletin article "One photo to rule you phone") – STOP, THINK, CLICK can also help you here. Finally, you might want to consider installing dedicated anti-malware detection apps like those offered by Avast or ESET.

For further information, questions or help, please check our website or contact us at **Computer.Security@cern.ch**.

Computer Security Team

Ombuds' Corner
Le coin de l'Ombuds

Employee silence

Although around a hundred cases a year are reported to the Ombuds, several issues may still not be disclosed due to employee silence*. The deliberate withholding of concerns, escalating misunderstandings or genuine conflicts can impede the global process of learning and development of a better respectful organizational workplace environment, and prevent the detection and correction of acts violating the CERN Code of Conduct.

For the employee him/herself, such silence can lead to feelings of anger, resentment, helplessness and humiliation. These feelings will inevitably contaminate personal and interpersonal relations, and poison creativity and effectiveness.

Employee silence can be explained by many factors; sometimes it is connected to organizational forces. In their published paper*, authors Michael Knoll and Rolf van Dick found four forms of employee silence.

People may stay silent if they feel that their opinion is neither welcomed nor valued by their management. They have given up hope and no longer consider making the effort of speaking up to change the situation. They may fear the consequences for themselves and so do not speak to anyone, prefering to suffer in silence. Let us not disengage, let's continue to improve the interpersonal relations inside our Institution! Remember that the Ombuds will listen to you in a complete confidentiality and will only act with your strict authorisation! You will stay completely in charge of the process you may choose.

Silence can be pro-social. In this case, employees are afraid to harm the image of the Institution, so they tolerate inconveniences at work without grievances. Remember that conflicts are inevitable. They will always arise as they are part of the dynamics and energy of an Organization. It is much more important to face them and resolve them as early, before they escalate and involve many complicated aspects!

There is also the unfortunate possibility where people withhold information to achieve an advantage for themselves. Such an opportunistic attitude is highly counterproductive and in contradiction with the core values of our Organisation. In particular, it contradicts with demonstrating a high level of motivation and dedication to the Organization.

Remember that your job satisfaction and well-being is negatively related to such silent behaviours. Working in complete transparency is what is most beneficial to you, your colleagues and the Organization, by increasing collaborative efforts and agreeable partnership. Efficiency will then be guaranteed, as well as mutual respect and understanding.

Conclusion:

Do not stay silent in your own corner: come and talk to the Ombuds, even just for a little chat. That may prevent you from feeling isolated or misunderstood. In his office, you can certainly speak up freely!

** "Do I Hear the Whistle…? A First Attempt to Measure Four Forms of Employee Silence and Their Correlates." By Michael Knoll and Rolf van Dick, Journal of Business Ethics (2013) 113:349-362.*

Vincent Vuillemin

News from the Library: PressDisplay on mobile devices!

You are probably already using PressDisplay to read newspapers online, but for those of you who are not yet aware of this service, PressDisplay is an online portal where you can browse and read online articles from more than 1,900 newspapers from 95 countries, as soon as they are published.

Whether you are an experienced user or a beginner, we have good news concerning PressDisplay: our license now permits you to download complete newspaper issues to your mobile devices and read them offline wherever you like. To do that, you have to use the mobile app PressReader.

Instructions on how to install the PressReader app are available at **http://library.web.cern.ch**.

Your feedback is welcome! Please contact us by e-mail at: **library.desk@cern.ch**

CERN Library

Official news

Taxation in France | Memorandum concerning the annual internal taxation certificate and the declaration of income for 2012

You are reminded that the Organization levies an internal tax on the financial and family benefits it pays to the members of the personnel (see Chapter V, Section 2 of the Staff Rules and Regulations) and that the members of the personnel are exempt from external taxation on salaries and emoluments paid by CERN.

I - Annual internal taxation certificate for 2012

The annual certificate of internal taxation for 2012, issued by the Finance, Procurement and Knowledge Transfer Department, is available since 15 February 2013. **It is intended exclusively for the tax authorities.**

1. If you are currently a member of the CERN personnel you received an e-mail containing a link to your annual certificate, which you can print out if necessary.

2. If you are no longer a member of the CERN personnel or are unable to access your annual certificate as indicated above, you will find information explaining how to obtain one at the following address: **https://cern.ch/admin-eguide/Impots/proc_impot_attestation_interne.asp**.

In case of difficulty in obtaining your annual certificate, send an e-mail explaining the problem to **helpdesk@cern.ch**.

II - 2012 income tax declaration form in France

The 2012 income tax declaration form must be completed in accordance with the indications available at the following address: **https://cern.ch/admin-eguide/Impots/proc_impot_decl-fr.asp**.

IF YOU HAVE ANY SPECIFIC QUESTIONS, PLEASE CONTACT YOUR TAX OFFICE DIRECTLY

This information does not concern CERN pensioners, as they are no longer members of the CERN personnel and are therefore subject to the standard national legal provisions relating to taxation.

Tax declaration: for the attention of members of the personnel and pensioners living in France

Exchange rate for 2012
For 2012, the average annual exchange rate is EUR 0.83 for CHF 1.

HR Department
Contact: 73903

Take note

The OHS-0-0-3 form on "Identification of occupational hazards" is now available on EDH

The EDH version of the OHS-0-0-3 "Identification of occupational hazards" form is now available at the following link: https://edh.cern.ch/apps/OHS.

Please remember that this form is an essential support tool for the identification of occupational hazards that employed members of the CERN personnel are exposed to during their professional activities.

It serves to identify a possible need for safety training and individual protective equipment and as a guide for the CERN Medical Service for the medical follow-up of the employed members of the CERN personnel.

Whenever there is a change in working conditions and at least once a year during the MARS exercise, the supervisor and supervisee must perform a joint analysis of the supervisee's working conditions.

Following this joint analysis, a short and clear summary of the supervisees' main activities has to be written and the hazards that the supervisee is exposed to during her/his professional activities have to be identified in the form.

Below are two examples of a short summary:

- "Administrative work, main workplace is the office. Occasional access to industrial areas during visits or verifications."
- "Preventive and corrective maintenance on electrical installation in electrical substation or on accelerator equipment at surface or in underground areas."

The OHS-0-0-3 form must be filled in accordingly and approved by the supervisor in EDH. For information, the data will be registered, by the CERN Medical Service, in the supervisee's medical file.

Take note

As of 2014, a link in the MARS document will direct to the EDH version of the OHS-0-0-3 form.

For more information, please consult the admin e-guide or contact the HSE Unit at the following address **safetyform.OHS003@cern.ch**.

HSE Unit

IMPORTANT NOTICE: Cancellation of shuttle Circuit 3

Circuit 3 of the CERN Shuttle Service (Point 5), which has served CMS since the start of LS1, will be cancelled with effect from Tuesday 16 April. This decision has been taken in consultation with CMS, as the circuit was seldom used.

In response to increasing demand for Circuit 1 - Meyrin and feedback from passengers, the two Circuit 3 journeys will be switched to Circuit 1 – Meyrin (see new timetable below):

- **Mornings:** Four journeys instead of three. Circuit 1 now starts at 8:10 (instead of 8:19 a.m.) and runs until 9:27 a.m. (instead of 9:16 a.m.).
- **Lunchtimes:** Five journeys in place between 12:10 p.m. and 1:47 p.m.
- **Evenings:** Circuit starts at 5:23 p.m. (instead of 5:03 p.m.) and ends at 6:20 p.m. at Building 33. Please note that the circuit will depart from Building 13 instead of Building 33.

Official CERN holidays | Restaurant opening hours

Please note that the CERN Restaurants will have the following opening hours during the upcoming holidays:

- Restaurant 1 will be open from 7 a.m. to 11 p.m. on Wednesday 1 May, Thursday 9 May (Ascension Thursday) and Monday 20 May (Pentecost) - on Friday 10 May the restaurant will be open at the usual times.
- Restaurant 2 will be closed over the 3 official CERN holidays, but will be open on Friday 10 May at the usual times (brasserie will be closed).
- Restaurant 3 will be closed over the 3 official CERN holidays, as well as Friday 10 May.

Closure of Restaurant 2

Please note that Restaurant 2 will close at 2:30 p.m. on Friday 3 May.

Get all the official CERN holidays automatically added to your CERN mailbox calendar

A new tool has been created that makes it easy to check the official CERN holidays. These holidays will appear automatically in your calendar.

Currently, to check the official CERN holidays, you had to consult either the CERN website or EDH. Now you can see these holidays in your CERN calendar together with absences, meetings and other events.

To take advantage of this feature: add yourself as member of the e-group "holidays-to-calendar". Your calendar will be updated the very next day.

CERN-Fermilab Hadron Collider Physics Summer School 2013 open for applications

Mark your calendar for 28 August - 6 September 2013, when CERN will welcome students to the eighth CERN-Fermilab Hadron Collider Physics Summer School.

Experiments at hadron colliders will continue to provide our best tools for exploring physics at the TeV scale for some time. With the completion of the 7-8 TeV runs of the LHC, and the final results from the full Tevatron data sample becoming available, a new era in particle physics is beginning, heralded by the Higgs-like particle recently discovered at 125 GeV.

To realize the full potential of these developments, CERN and Fermilab are jointly offering a series of "Hadron Collider Physics Summer Schools", to prepare young researchers for these exciting times. The school has alternated between CERN and Fermilab, and will return to CERN for the eighth edition, from 28 August to 6 September 2013.

The CERN-Fermilab Hadron Collider Physics Summer School is an advanced school which particularly targets young postdocs in experimental high energy physics (HEP), as well as senior PhD students in HEP phenomenology, working towards the completion of their thesis. Other schools, such as the CERN European School of High Energy Physics, may provide more appropriate training for students in experimental HEP who are still working towards their PhDs.

The school will include nine days of lectures and discussions, and one free day in the middle of the period. Limited scholarship funds will be available to support some participants. Updated information and online applications are available at the school's web site: http://cern.ch/hcpss/2013.

Apply now!
The deadline for applications and reference letters is 30 April, 2013.

Location: CERN
Dates: 28 August to 6 September, 2013
Deadline for applications: 30 April, 2013
Web site: **http://cern.ch/hcpss/2013**

Julien Lesgourgues presents his book "Neutrino Cosmology"

In this self-contained book, the authors bring together all aspects of the role of neutrinos in cosmology, spanning from leptogenesis to primordial nucleosynthesis and from their role in CMB and structure formation, to the problem of their direct detection. The book starts by guiding the reader through aspects of fundamental neutrino physics, such as the standard cosmological model and statistical mechanics in the expanding Universe, before discussing the history of neutrinos chronologically from the very early stages until today.

"Neutrino Cosmology" by Julien Lesgourgues, Gianpiero Mangano, Gennaro Miele, Sergio Pastor, Cambridge University Press, 2013, ISBN 9781107013957.

Monday 22 April 2013 at 4 p.m. in the Library, 52-1-052.
Tea and coffee will be served from 3:30 p.m.

CERN Library

Training & Development

Oracle support provides a range of new tutorials

CERN IT-DB Group is pleased to announce a new series of Oracle tutorials, with the proposed schedule:

Tuesday 30 April
Database Design & Security (30-7-018 - Kjell Johnsen Auditorium)

Wednesday 8 May
SQL (40-S2-C01 - Salle Curie)

Tuesday 21 May
PL/SQL (30-7-018 - Kjell Johnsen Auditorium)

Monday 27 May
Troubleshooting Performance (40-S2-C01 - Salle Curie)

Wednesday 5 June
Troubleshooting Performance - Case Studies (40-S2-C01 - Salle Curie)

Launch of new e-learning course "Safety during LS1"

After 3 years of activity, the LHC and the rest of the accelerator chain have been shut down for about 2 years (from February 2013 to December 2014) due to maintenance and upgrade work, on the surface as well as underground.

CERN has developed a new e-learning course related to this Long Shutdown period (LS1) so as to provide all the collaborators working in the LS1 area with accurate security-oriented information.

The objectives of this new course are to:

- Present LS1 and its context,
- Identify CERN facilities' major risks,
- Identify the main risks associated with our co-activities,
- Explain how safety issues are being handled at CERN,
- Present all the basic safety measures to be respected,
- Present all emergency and rescue instructions.

The course is available via the e-learning SIR application. It is compulsory for all newcomers at CERN, along with the "CERN Safety Introduction" training. It is also highly recommended that people who were already working at CERN before the course was launched follow this new course.

To date, over 1,100 persons have taken the "Safety during LS1" course.

New course: "Lync – click to call and collaborate with others"

The presentation will cover main features of Lync: initiating and receiving phone calls from Lync, chatting (Instant Message), how to stay connected as if you were in your office, creating and participating in online meetings, sharing presentations/desktops with other people, using voice mailbox on Exchange, integration with Outlook, CERN Phone book, phone system etc.

General information about Lync can be found on **http://cern.ch/lync**. Softphone features of Lync are detailed on **http://cern.ch/softphone**.

Next session: **16 May 2013** from 2 p.m. to 3 p.m. in English. Please register through the training catalogue.

Safety Training: places available in April 2013

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

Refresher course Self-Rescue Mask Training
29-APR-13, 8.30 – 10.00, in French
29-APR-13, 10.30 – 12.00, in English

Self-Rescue Mask Training
25-APR-13, 8.30 – 10.00, in English
25-APR-13, 10.30 – 12.00, in English
30-APR-13, 8.30 – 10.00, in French
30-APR-13, 10.30 – 12.00, in French

Use of fire extinguisher – live exercises

24-APR-13, 8.30 – 10.30, in French
24-APR-13, 10.30 – 12.30, in French
26-APR-13, 8.30 – 10.30, in English
26-APR-13, 10.30 – 12.30, in English

Self-Rescue Mask Training

Nine new self-rescue mask instructors have been trained since early 2013, which provides CERN with a total of 26 self-rescue mask instructors to date. This will allow us to meet the increasing training needs caused by the Long Shut Down LS1.

The self-rescue mask instructors have trained 1650 persons in 2012 and about 500 persons since the beginning of the year on how to wear the masks properly. We thank all the instructors and all the persons that made this training possible.

Please remember that the self-rescue masks training sessions are scheduled as follows:

- **Basic course**: Tuesday and Thursday mornings (2 sessions – 8.30 AM and 10.30 AM), duration: 1.30 hour, in French and English – registration via CERN online training catalogue – Course code 077Y00.
- **Refresher training**: Monday mornings (2 sessions – 8.30 AM and 10.30 AM), duration: 1.30 hour , in French and English – registration via CERN online training catalogue – Course code 077Y00R.

For any information regarding specific trainings, please contact: **safety.training@cern.ch**.

French courses

General and Professional French Courses
The next session will take place from **29 April to 5 July 2013**.
These courses are open to all persons working on the CERN site, and to their spouses.
For registration and further information on the courses, please consult our Web pages or contact Kerstin Fuhrmeister (**kerstin.fuhrmeister@cern.ch**).

Oral Expression
This course is aimed for students **with a good knowledge of French** who want to enhance their speaking skills.
Speaking activities will include discussions, meeting simulations, role-plays etc.
Suitable candidates should contact Kerstin Fuhrmeister (70896) in order to arrange an appointment for a test.
The next session will take place from **29 April to 5 July 2013**.

Writing professional documents in French
These courses are designed for non-French speakers with a **very good standard of spoken French**.
Suitable candidates should contact Kerstin Fuhrmeister (70896) in order to arrange an appointment for a test.
The next session will take place from **29 April to 5 July 2013**.

Seminars

WEDNESDAY 24 APRIL

TH THEORETICAL SEMINAR

14:00 The total top quark pair production cross-section at hadron colliders to NNLO

ALEXANDER DIMITROV MITOV (CERN)

CERN (4-2-011 - TH COMMON ROOM)

THURSDAY 25 APRIL

ACADEMIC TRAINING LECTURE REGULAR PROGRAMME

11:00 Beyond Feynman Diagrams (2/3)

LANCE DIXON (SLAC)

CERN (222-R-001 - FILTRATION PLANT)

COLLIDER CROSS TALK

11:00 LHCb measurement of the CKM angle gamma

TILL MORITZ KARBACH (CERN)

CERN (4-2-011 - TH COMMON ROOM)

TH BSM FORUM

14:00 Top-Quark Charge Asymmetry: New Observables for Hadron Colliders

SUSANNE WESTHOFF (UNIVERSITY OF PITTSBURGH)

CERN (4-2-011 - TH COMMON ROOM)

FRIDAY 26 APRIL

ACADEMIC TRAINING LECTURE REGULAR PROGRAMME

11:00 Beyond Feynman Diagrams (3/3)

LANCE DIXON (SLAC)

CERN (222-R-001 - FILTRATION PLANT)

PARTICLE AND ASTRO-PARTICLE PHYSICS SEMINARS

14:00 Rare B decays at the NNLO in QCD

MIKOLAJ KRZYSZTOF MISIAK (UNIVERSITY OF WARSAW)

CERN (4-3-006 - TH CONFERENCE ROOM)

SATURDAY 26 APRIL

RASPBERRY PI

13:00 Le Raspberry Pi au Fêtons LINUX

CHAIR: WILLIAM HAMISH BELL (UNIVERSITE DE GENEVE)

HEPIA (CAFETERIA)

MONDAY 29 APRIL

ACADEMIC TRAINING LECTURE REGULAR PROGRAMME

11:00 The Upgrade Programme of the LHC Detectors (1/3)

DANIEL PITZL (DESY)

CERN (40-S2-C01 - SALLE CURIE)

TUESDAY 30 APRIL

ACADEMIC TRAINING LECTURE REGULAR PROGRAMME

11:00 The Upgrade Programme of the LHC Detectors (2/3)

DANIEL PITZL (DESY)

CERN (40-S2-C01 - SALLE CURIE)

HUPP GROUP - TURKISH STUDENTS MEETINGS

21:00 Next Hupp Meeting

TR

Management & Communication training

Management and communication courses – Places available

There are places available in some management and communication courses taking place in the period April to June 2013.
For advice, you can contact Erwin Mosselmans (tel. 74125, **erwin.mosselmans@cern.ch**)
or Nathalie Dumeaux (tel. 78144, **nathalie.dumeaux@cern.ch**)

Course in English (or bilingual)	**Dates**	**Duration**	**Language**	**Availability**
Managing stress	29 and 30 May	2 days	English	3 places
Making Presentations	30, 31 May & 25 June	3 days	English	2 places
Communicating Effectively - Residential course	4 to 6 June	3 days	Bilingual	9 places
Handling difficult conversations (Adapted from Dealing with Conflict)	7 and 14 June and 13 September	3 days	English	6 places
Voice and Nonverbal Behaviour in Speech Communication	17 and 18 June	1 day 4 hours	English	7 places
Managing Teams	18 to 20 June	3 days	English	3 places
Quality Management	08 to 9 July	2 days	English	8 places
Cours en français				
Techniques d'exposé et de présentation	29 et 30 avril & 12 juin	3 jours	Français	1 place
Savoir gérer les discussions difficiles	15 et 22 mai et 26 juin	3 jours	Français	9 places
Les enjeux de la voix et du comportement non verbal dans la communication orale	21 au 22 mai	1 jour 4 heures	Français	5 places
Communiquer pour convaincre	28, 29 mai	2 jours	Français	7 places
Gestion du stress	5 et 6 juin	2 jours	Français	2 places