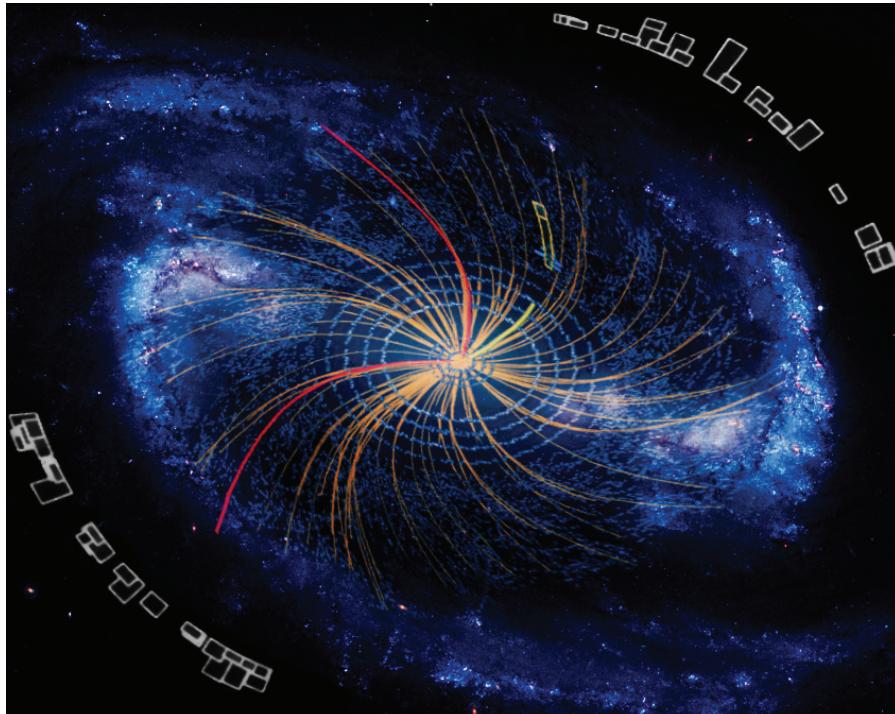




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The Higgs and the inflation of the Universe



"The Higgs universe". Image: ATLAS, NASA, ESA and The Hubble Heritage Team (STScI/AURA) - edited by Katarina Anthony.

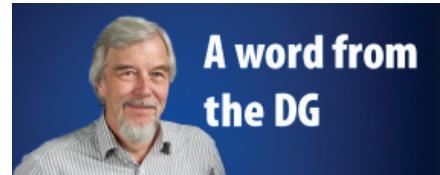
"Inflation" is the theorized very rapid and powerful expansion of the early Universe. This type of evolution could be explained by the presence of a spin-zero elementary particle born with the Big Bang. The Higgs boson is such a particle but this is not sufficient for it to be identified as the "inflaton", the hypothetical particle thought to be responsible for this inflation.

It is thought that almost immediately (around 10^{-35} seconds) after the Big Bang, the Universe increased in volume extremely rapidly by undergoing an exponential expansion phase. Following this "inflationary" period, the Universe continued to expand but at a slower rate. A quantum field corresponding to an elementary spin-zero boson could, in principle, have caused such a violent evolution. According to the Standard

Model, the Higgs boson is indeed a spin-zero elementary particle. However, all that glitters isn't gold, as CERN's theorist Gian Giudice points out: "The idea that the Higgs field plays the role of the inflaton is very intriguing. Unfortunately, this cannot be the case in the framework of the plain Standard Model."

The problem for the theory is that the Higgs boson seems to need a sort of "correction" in order to play the role of the

(Continued on page 3)



LHC physics? I like it!

When asked why I called the new particle "Higgs like", rather than just "Higgs", I used to joke that it's because I like it. And indeed I do. But now we can confidently drop the 'like': this new particle is almost undoubtedly a Higgs.

(Continued on page 2)

In this issue

News

The Higgs and the inflation of the Universe	1
LHC physics? I like it!	1
Just a few metres... but the stakes are high	2
Heatwave warning for the LHC	3
LS1 Report: the electric atmosphere of the LHC	4
More statistics, less surprise	4
The MedAustron project: an example of large-scale technology transfer	5
Printshop open days	6
CERN stationery rejuvenated	6
A marvel of precision: MedAustron	7
Don't put your family at risk	8
Ombuds' corner: "I want it to stop!"	9
Luisella Goldschmidt-Clermont (1925 – 2013)	9

Official news

Take note	11
Safety Training course	12
Seminars	13
Management & communication training	14

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A word from the DG

(Continued from page 1)

LHC physics? I like it!

What leads me to say that with such confidence is the skill and dedication of the Higgs analysis teams from ATLAS and CMS. Over the last few months they have shown that a number of key properties of the new particle all point to it being a Higgs: the way it interacts with other particles agrees with theoretical predictions for a Higgs particle, and its quantum properties of spin and parity are as required for a Higgs.

The question we need to ask now is what kind of Higgs is it? Is it the Higgs of the Standard Model of particle physics? If so, then one of the crowning achievements of 20th century physics will be complete, with a theory that fully explains the behaviour of the particles that make up the visible Universe, along with all of their interactions with the exception of gravity. Or is it a Higgs boson associated with a theory, such as supersymmetry, that goes beyond the Standard Model, perhaps accounting for some of the 96% of the Universe that is not visible?

This question will take much longer to answer. For now, the analyses of ATLAS and CMS are both fully consistent with a Standard Model Higgs particle, but they are not yet precise enough to differentiate between the Standard Model and theories that go further. It is the precise measurement of the way the new particle interacts with other particles that will allow that differentiation to be made, ultimately letting us know whether we have closed a major chapter in humankind's exploration of the Universe, or whether we have opened a new one. Either way, it remains very fair to say that I very much like the way that the LHC physics programme is developing.

Rolf Heuer

Just a few metres... but the stakes are high

A beam of negative hydrogen ions has been injected into the first accelerator module of Linac4, the linear accelerator which will replace Linac2.



The Linac4 team celebrate the acceleration of the first beam by the RFQ module.

Wednesday, 13 March was a big day for the Linac4 teams. At its temporary location in an old PS hall, the first element in the Linac4 accelerator chain, the Radio Frequency Quadrupole (RFQ) module, accelerated its first beam produced by the new source built for Linac4. This crucial step was a complete success!

"Only three metres in length, the RFQ is at the start of the beam's path, immediately after the ion source and the low-energy transport line," explains Maurizio Vretenar, the Linac4 project leader. "Its job is to increase the beam's energy from 45 keV to 3 MeV. The section commissioned on Wednesday, which includes the source, the low-energy transport line and the RFQ, is only five metres long but still manages to pose all sorts of difficulties! At these low energy levels, we have to deal with two types of problem. Firstly, over the five metres, the beam must go from a speed of zero to 24,000 km/s, which is 8% of the speed of light! Moreover, at such energy, it is more complicated to focus the beam because of Coulomb repulsion. This repulsion phenomenon, which decreases as energy increases, has a tendency to break up beams made up of particles of the same type, in this case hydrogen ions."

The success of these first tests is the culmination of an extensive programme of work that began in 2008. As well as building the RFQ, which was done in-house, CERN teams had to construct a new source that will eventually be able to supply the hydrogen

ion beams (one proton linked to two electrons) required to improve injection into the booster and which, coupled with the increased injection energy of 160 MeV, will make it possible to increase the intensity of the beams for the LHC. "The design of the source turned out to be more complex than expected, but the teams in charge of the project and its technical implementation were able to react quickly to allow us to carry out the tests on the RFQ in time," adds Maurizio Vretenar. "The tests on Wednesday 13 March were extremely promising. Right from the first beam, we were receiving 10 mA at the output of the RFQ accelerator, and this was without any adjustment or focusing at the output. It was a great demonstration of our machine's potential!"

The first tests on Linac4 will finish on 31 May. Then the cooling station will be cut off for maintenance and the modules will be dismantled and moved into the Linac4 tunnel. In September 2013, the linear accelerator will be switched back on again to continue the tests. Tests at increasingly higher energy levels will begin in 2014, until 160 MeV is reached in 2015. A year of non-stop operation will follow, in order to test the system's reliability. "Linac4 will operate continuously for many years, so it needs to be stable and reliable," explains Maurizio. "But in addition to overcoming the technical challenges, I have been most impressed with the real teamwork shown. The sheer quantity of skills that have been brought together in these first five metres of acceleration is incredible. Specialists in radiofrequency, mechanics, beam dynamics and diagnostics, ultra-high vacuum, control and power electronics, survey, magnets and other fields have succeeded in working in perfect harmony with each other to complete this all-new accelerator."

Caroline Duc

Heatwave warning for the LHC

Engineers have been able to start warming up the first sectors of the LHC where the tests on the superconductor circuits have been completed. Raising the temperature from 1.9 K to 300 K is a remarkable but delicate process.



Filling the first liquid-helium truck for external storage.

The first update on LS1, published in the previous edition of the Bulletin, announced the start of the Electrical Quality Assurance (EQA) tests on the LHC magnets. These tests began on 22 February and have already been completed in two Sectors: "The integrity of the magnets' electrical insulation has been fully verified in sectors 4-5 and 5-6," reports Mirko Pojer, Engineer in Charge of the LHC. "This is vital in order for the magnets to function properly at the nominal current, which we should reach in 2015. The EQA team has also run other tests, in particular to verify the electrical insulation between the coils. Fortunately, we have not detected any major problems so far."

The EQA tests have been carried out at 1.9 K because that is the usual operating temperature of the LHC, but once the tests have been completed, things turn tropical! The temperature of the accelerator is gradually increased until it reaches ambient temperature. "The machine is heated up in three phases," explains Serge Claudet, leader of the Cryogenics Operation for Accelerators Section. "First, the liquid helium that the magnets are bathed in is emptied; that's around 15 tonnes of helium for each sector. Then we start the first warming-up phase; the temperature increases from just a few kelvin to an average of 150 K. At this stage, the vacuum team begins the first series of leak tests. Then comes the final warming-up phase, which brings the magnets to ambient temperature." In order to do this, a small quantity of the extracted helium is re-injected into the cryogenic circuit in the form of 'hot' gas.

Given that the magnets are so well insulated, it is much more effective to warm them up from the inside. Finally, to speed up the process, the insulation vacuum is steadily reduced. All in all, it takes a total of about four weeks to completely warm a sector up.

During normal operation, the cryogenic circuits of the LHC contain some 135 tonnes of helium (plus another 15 tonnes in reserve). By contractual arrangement, 100 of these 135 tonnes will be temporarily returned to the supplier, who will then give the helium back to CERN in spring 2014. The fact of the matter is that with maintenance on the large refrigeration installations to be carried out during LS1, CERN will not have the capacity to keep such a large amount of helium.

With one sector being emptied each week, the entire machine should finally be at ambient temperature by the end of May, at which point the Cryogenics Group will begin the maintenance phase. For the time being, the warming-up of the magnets in the first sector (5-6) is well under way, and has just started in sector 4-5. When they have reached the desired temperature, the magnets will undergo another series of electrical tests and vacuum insulation tests, as well as the "ball test". Keep an eye on the Bulletin to find out how they "bounce back" from the tests...

Anais Schaeffer

The Higgs and the inflation of the Universe

(Continued from page 1)

inflaton. "A possible solution could be an anomalously large gravitational interaction between the Higgs field and the curvature of the space-time geometry," says Gian Giudice. "Such large coupling implies the existence of new heavy particles. In other words, inflation would not be driven by the Higgs field alone but, at best, by a combination of the Higgs field with other, still unknown, fields."

How will the experiments probe all these theories? "It will be very difficult for the LHC experiments to investigate the properties of the Higgs boson deeply enough to provide an answer," says Sergio Bertolucci, CERN's Director for Research and Computing. However, some information could also come from cosmological experiments such as the ESA satellite, Planck. "There is still much to learn from the structure of the Cosmic Microwave Background (CMB) and we are eagerly awaiting the results from the Planck satellite. Discovery of non-gaussianity in the temperature fluctuations of the CMB would open new avenues in our understanding of inflationary dynamics," says Gian Giudice.

"We need to understand the Higgs boson and its field much more deeply before we can say the last word on its role in the evolution of the Universe," concludes Sergio Bertolucci. In other words, it may very well be that not all the questions about the Higgs boson will be answered by the LHC.

Antonella Del Rosso

LS1 Report: the electric atmosphere of the LHC

In the LHC, testing of the main magnet (dipole and quadrupole) circuits has been completed. At the same time, the extensive tests of all the other circuits up to current levels corresponding to 7 TeV beam operation have been performed, and now the final EIQA (Electrical Quality Assurance) tests of the electrical circuits are proceeding.

In Sectors 4-5 and 5-6, where the EIQA checks have been finished, the process of removing and storing the helium has started (see the article Heatwave warning for the LHC, in this issue). This is the first step in warming up the whole machine to room temperature so that the main LS1 activities, SMACC (Super Conducting Magnet and Circuit Consolidation) and the R2E (Radiation Two Electronics) programmes, which are scheduled to start on 19 April and 22 March respectively, can get under way.

As far as the LHC injectors are concerned, LINAC2 and the PS Booster are in shutdown mode, having completed their preparatory hardware test programmes, and shutdown work has already started. At the PS, access for LS1 activities also started this week, whilst at the SPS an extensive magnet test programme will continue until 26 March. This programme is aimed at identifying magnets that will need to be repaired or changed during LS1, and preparing the work and maintenance programmes for the magnet group during the coming 18 months.

Simon Baird

EIQA tests

Electrical Quality Assurance tests aim at detecting magnet non-conformities by measuring the electrical insulation of each magnet with respect to earth. For these tests, engineers apply a high voltage between the magnet coil and earth to ensure it is perfectly electrically insulated.

More statistics, less surprise

The LHCb collaboration has recently announced new results for a parameter that measures the CP violation effect in particles containing charm quarks. The new values obtained with a larger data set and with a new independent method are showing that the effect is smaller than previous measurements had suggested. The parameter is back into the Standard Model picture.

CP violation signals – in particles containing charm quarks, such as the D^0 particle, is a powerful probe of new physics. Indeed, such effects could result in unexpected values of parameters whose expectation values in the Standard Model are known. Although less precise than similar approaches used in particles made of b quarks, the investigation of the charm system has proven to be intriguing.

The LHCb collaboration has reported new measurements of ΔA_{CP} , the difference in CP violation between the $D^0 \rightarrow K^+K^-$ and $D^0 \rightarrow \pi^+\pi^-$ decays. The results are obtained with two independent analyses performed on the full 2011 data set. The two methods allow useful cross-checks, for example

because background has different origins in the two analyses and can therefore be understood better.

Compared to LHCb previous value, the new averaged result, $\Delta A_{CP} = (-0.15 \pm 0.16)\%$, is closer to zero and therefore does not confirm the previous evidence of CP violation in the charm system. Detailed investigations on the samples reveal that the change from the previous result is consistent with statistical fluctuations.

Theoretical work triggered by the initial surprising measurement had shown that although the non-zero value found by LHCb could be accommodated within the Standard Model picture, the room for new physics remained open. These new results constrain significantly the window still open to new physics. Further update of this and related measurements will be needed to discover if – and at what level – nature distinguishes between charm and anticharm.

Antonella Del Rosso & the LHCb collaboration

The MedAustron project: an example of large-scale technology transfer

In January this year, CERN's Director-General Rolf Heuer handed over the first ion source to the MedAustron therapy centre in the town of Wiener Neustadt in the presence of the Austrian authorities. This milestone marks the beginning of the transition from the development and design phase to the commissioning of the new facility.

The goal of the **MedAustron project** is the construction of an ion-therapy and research centre, based on a synchrotron accelerator complex, in Austria. "MedAustron will be the first large-scale accelerator facility in Austria and for its realisation agreements have been set-up between the province of Lower Austria, the construction company EBG MedAustron and CERN," says Michael Benedikt, the MedAustron project leader. Erwin Pröll, Governor of Lower Austria, continues: "MedAustron is a key project for establishing Lower Austria on an international level as a research and high-tech-medicine region. More than 1,000 patients per year will receive treatment at MedAustron in the future. The impressive progress of the project would not have been possible without the substantial support of CERN."

The design of the MedAustron accelerator complex is based on the CERN Proton Ion Medical Machine Study (PIMMS) and its further development and technical implementation by the Italian **CNAO** foundation. Since such a facility is anything but a standard solution, Lower Austria and EBG MedAustron requested CERN's involvement in the realisation of the Austrian project. For a period of four years now, CERN staff have helped to build up a team of engineers and technicians employed by EBG MedAustron, and have trained them at CERN. Together, they designed the particle accelerator and built and procured its components, in some cases also relying on the expertise and technical design of CNAO. Substantial help was also provided by PSI, in particular for the gantry and beam delivery design. "The CERN-MedAustron collaboration is a perfect example of technology transfer from fundamental research to a practical application in a Member State," said Rolf Heuer.

One of the main goals for 2012 was the operation of a test stand at CERN, designed to qualify the pre-injector. The test stand was operated in the ISR hall 184 and achieved the nominal performance in December 2012. "Today, the main common goals, i.e. the development and construction of the accelerator components and the training of MedAustron personnel, have been successfully achieved, allowing the timely start of accelerator installation in Austria," says Michael Benedikt. "This set-up has given EBG



Handover of the ion source to MedAustron on 11 January, 2013. From left to right: Michael Benedikt (Project Leader MedAustron at CERN), Karlheinz Töchterle (Austrian Federal Minister of Science and Research), Erwin Pröll (Governor of Lower Austria), Rolf Heuer (Director-General CERN), Klaus Schneeberger (Lower Austrian State Parliament, Head of EBG MedAustron Council).

MedAustron trainees the unique opportunity to acquire CERN's know-how in the diverse fields of accelerator design, construction and operation."

The work carried out in the framework of the MedAustron project also created synergies with other CERN projects: the MedAustron vacuum control system, entirely built from off-the-shelf components, has been successfully used in the Linac4 test set-up; a novel synchrotron radiofrequency system jointly developed for the MedAustron project and the CERN PS Booster will find its first application in the MedAustron synchrotron; the power converter control uses the top-notch technology of CERN's accelerators. There is a little bit of the LHC experiments in the accelerator, too: the accelerator control system and several of its core components are derived from technologies used in the CMS experiment.

The MedAustron building in Wiener Neustadt was completed in autumn 2012 and, with the completion of the accelerator component production, the focus of activities will shift to installation and commissioning in Wiener Neustadt in the course of 2013. This will mark the successful completion of large-scale



MedAustron injector test stand at CERN in building 184.

knowledge transfer from CERN to MedAustron and Austria and from fundamental research to medical application.

"The future operation of MedAustron as a research facility will further strengthen the links that have been created with this project between Austria and CERN," underlined Karlheinz Töchterle, Austrian Federal Minister of Science and Research.

Antonella Del Rosso & Michael Benedikt

Printshop open days

With new machines, new services and new opening hours, the CERN Printshop has turned over many new leaves at the start of 2013. Come and find out more from 25 to 27 March at the Printshop open days!

The CERN Printshop's new 8-metre long black-and-white printer is a technical marvel. It can produce 160 pages per minute (it prints on both sides in one pass) and can also staple, punch holes, do thermal binding and make A4 or A5 brochures.

The new colour printer is more discreet but no less efficient: it churns out 70 A4 or A3 pages per minute. Once they are printed, colour documents can be inserted into the black and white machine to be hole-punched, made into brochures or bound. They can even be mixed in with black-and-white pages and, as if by magic, come out in the right order!

Having recently acquired a state-of-the-art large-format printer, the CERN Printshop can now print posters in A2, A1 or A0 format. Please note that these jobs are only carried out on final versions, and that no "test" is included in the price (we advise you to do your test jobs on an A3 printer). In addition, the Printshop still offers the same services as before: spiral binding, and lamination of



The CERN Printshop's new 8-metre long black and white printer.

documents, as well as the sale of postertubes and conference badge-holders.

Please be aware that print orders must now be placed by completing a form at <https://cern.ch/printservice/>. Documents must be submitted in PDF format. Every order will result in a ticket being created with the Service Desk so that requests can be followed up more easily.

Anaïs Schaeffer

The Printshop open days will take place on 25, 26 and 27 March, from 9.00 a.m. until 12 noon and from 1.00 p.m. until 4.00 p.m. Don't miss out! You may get a special "printshop present" (hurry while stocks last!).

New opening hours for the CERN Printshop (Building 510-R-007):
9.00 a.m. to 12 noon and 1.00 p.m. to 4.00 p.m., Monday to Friday.

CERN stationery rejuvenated

With the introduction of CERN's new graphic charter, our complete range of official communications stationery has been redesigned. Discover the newly harmonised and standardised range of CERN stationery.



As the Director-General announced in Bulletin 41-42/2012, a new graphic charter is now in force at CERN. The graphics team has taken this opportunity to redesign all the official

CERN stationery, such as business cards, correspondence cards, letterheads, envelopes and file holders, all of which will now boast the same, unified format.

In keeping with CERN's new graphic charter, even the business cards have had a makeover: of a better quality than their predecessors, they now elegantly display the CERN colours (namely the familiar Pantone 286 blue). These new cards, which all follow a standardised format, help to project a standardised corporate image of the Organization. Order them [online](#) now!

As the Director-General highlighted, "it's increasingly important for [our] message to be that CERN is a modern and innovative organisation with a clear sense of its own identity."

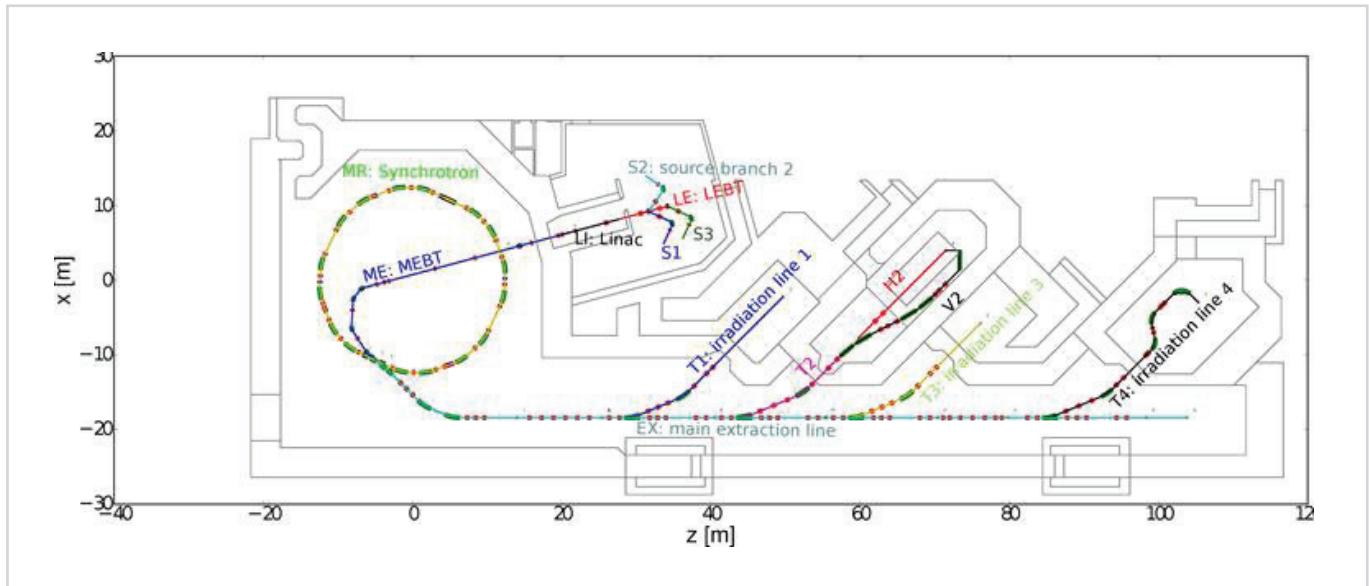
Anaïs Schaeffer

To order business cards, please follow the link on this page to the online form.

Correspondence cards, letterheads, envelopes, file holders and other official stationery products must be ordered directly from the CERN Stores.

A marvel of precision: MedAustron

MedAustron, which is currently being built in Austria, will be one of the most advanced centres for ion beam therapy and research in Europe. It is based on the same design as the Italian National Centre for Oncological Hadrontherapy (CNAO), which in turn is based on the CERN-led Proton Ion Medical Machine Study (PIMMS). MedAustron should welcome its first patient at the end of 2015.



Layout of the MedAustron accelerator complex.

With three ion-sources, a linac, a synchrotron and four irradiation rooms (see picture), **MedAustron** is a huge accelerator complex. Among other equipment, it comprises 300 magnets of 30 different types, all designed at CERN but produced at different sites: "We are working with five main suppliers from Europe and Russia," explains Thomas Zickler, leader of the MedAustron magnet group. "All the magnets come to CERN to undergo a series of strict acceptance tests." From the interfaces, to the electrical insulation, the cooling and interlock performance... everything is carefully checked to ensure that each magnet complies perfectly with the design.

"A lot of CERN experts are currently working on the project in close collaboration with Austrian physicists and engineers," explains Marco Buzio, a senior magnet engineer at CERN. "Our MedAustron colleagues can also use our test station, which is a unique facility in Europe, and learn how these magnets behave." The MedAustron project has also been a golden opportunity for CERN to develop new high-performance test and measurement equipment, which is turning out to be extremely relevant to other projects.

Another phase of tests includes magnetic measurements. "Some of the magnets are tested in industry, but the most critical and complicated measurements are performed at CERN, which include all pre-series magnets as well as the bending dipoles - all in all, about 150 magnets," adds Giancarlo Golluccio, a PhD engineer for MedAustron. "Once the magnets meet all our expectations, they are sent to Austria where they are installed."

"We pay particular attention to the dynamics of the magnetic field, as it is modulated to match the ever-changing beam energy," emphasises Marco Buzio. "Such a machine has to be cycled as fast as possible to minimise the impact on patient treatment plans. The beam control accuracy also has to be extremely high as it needs to target the tumour very precisely." To ensure very high availability, everything has to be perfect right from the start: "All the steel used for the magnets – which represents 700 tonnes of electrical low-carbon steel – comes from the same Austrian supplier," adds Thomas Zickler. "We then distribute it to all the manufacturers. This way, we ensure that all the magnets are made of the same high-quality material."

The first magnets were installed at MedAustron a few weeks ago (see "[The MedAustron project: an example of large-scale technology transfer](#)"). If all goes well, the injector and the synchrotron should be completed and commissioned by the end of the year. By 2014, the first proton beam will reach one of the irradiation rooms, which will allow the first patient to be treated there by the end of 2015..

Anaïs Schaeffer

Don't put your family at risk

How easy is it to fall into the trap of cyber-criminals? Get one's online banking password stolen? Lose photos to third parties? It's easier than you think. One single click to open a malicious attachment or a malicious web page is sufficient to put your family at risk.

Sometimes adversaries even **call you in order to get their malicious job done**. Once their malware is installed on your home computer, it records all your activity, monitors your online banking activities, steals your passwords, activates your computer's microphone and camera, and sends all that data back to the adversary. This person can now do whatever they want: take money from your bank account, order books with your Amazon password, deface your Facebook profiles, send strange messages to your peers, or post the captured images of your daughter in front of the computer on dodgy web sites. Not only can you lose (lots of!) money, but having strange messages sent on your behalf and your private images made public can also be very embarrassing.

So don't put your family at risk! Think of the security of your computers at home! Our advice for protecting networks and computers at CERN also holds for usage at home: restrict access, patch and run anti-virus software, keep your password to yourself, and stop–think–click before accessing untrustworthy websites. Here are a few helpful hints to make your family's life more secure.

If you run your own wireless access point (a hardware box connected to your telephone line), ensure that communication is encrypted using at least the WPA2 protocol and a strong password. This will protect you and your family from someone piggy-backing on your network connection. Wireless security protocols like "WPA" or "WEP" can easily be broken. Also make sure that the hardware's firmware is always up-to-date. Usually you can do both from the configuration menu of your wireless access point.

For patching:

- If you have a personal computer with your own Windows operating system, check for "Windows Update" in the programme listing of the Start button. Switch to the recommended "automatic" updating method!
- On Linux distributions, make sure that you regularly run "yum update", or even better, enable automatic updates. Don't forget to reboot your computer when a new kernel is installed, in order to properly apply kernel patches!
- For Apple Macs, use the software update mechanism which is accessible under the Apple menu.

The CERN anti-virus software for **Windows** and **Mac** can also be used at home - for free! Also, ensure that you also regularly update your Acrobat Reader, Adobe Flash, Java and all the others. If you are in doubt (and are running a Windows system), you can install and run this fine programme from **Secunia** which checks your computer for outdated software.

Concerning your password, choose it with care and do not use the same password for different sites including CERN. Have a look at **CERN's password rules**, which also apply to your home usage. Take particular care of your online banking password! For better protection, banks usually employ an additional hardware token for online banking (which is why you have a small USB pocket

calculator). Eventually, you might want to use similar techniques for your Google+ (called "GAuth") or Facebook account.

Did we mention it before? Stop–think–click when browsing the web. Visit only the sites you deem trustworthy!

Finally, share this information with your spouse and kids. Tell them all! Make them aware of the risks of using a computer connected to the Internet, and remember that "computer security" is like **roadsafety education**, looking left-right-left when crossing a road. If you would like to learn more, **click here for some easy online courses** that delve deeper into this subject.

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

Computer Security Team



"I want it to stop!"

Most people that seek help from the Ombuds just want that their dispute ended, so they can get back to work in normal, respectful conditions. They clearly express it when I ask them what they want: "I want it to stop!" How should it stop? And who should stop it?

Ideally the interpersonal issues between the people working at or on behalf of CERN should be resolved between the colleagues concerned. This should really be expected in cases where the colleagues are part of the senior staff, for two main reasons: first, their high accountability to the institution should prevent them from falling into ineffective disputes; second, they are in charge of fostering dialogue among their supervisees and should not present such a detrimental image of fighting against each other.

Where conflict arises between a manager and a supervisee, and mutual understanding cannot be reached, their management should act and stop the fight right away to prevent further escalation of the dispute. Establishing a "cease-fire" should be the first order of business. Next, a suitable discussion can take place with management or with the various conflict resolution services available at CERN.

The real difficulty arises when management does nothing - when they do not immediately stop the incorrect behaviour, perhaps because they do not realize that there is

bad blood, they do not know what to do, they do not want to interfere, or they do not have the courage to interfere with the conflict under the illusion that things might get better by themselves. Any conflict, if left unattended, will get worse. Miracles do not exist in this domain. The consequences of such indecision are harmful: some people may believe that they are protected by some kind of impunity, and others may feel entirely abandoned. Generally, it is when they reach this level of confusion that people come to the Ombuds. Fortunately, it is not too late, but it would have been much more effective if the parties had come sooner.

The Ombuds offers a neutral and impartial help to help colleagues reach an informal resolution to conflicts. In that sense, neutrality and impartiality means that he will not favour any party, whether it is a manager or a supervisee. The Ombuds helps managers and supervisees, in order to re-establish good communication in their mutual interest and in the interest of CERN. It is appropriate that during their disputes, parties do not forget about the fundamental interest of CERN, which is their environment.

Conclusion:

The first thing to do during a dispute is to stop the fight immediately. Either the parties realize that by themselves, their management acts courageously, or they seek help from the various services which provide it. It is also suggested that the Ombuds, due to his neutral, impartial and independent position, be consulted as soon as possible. Do not let conflicts inflate to the point where people will be wounded, stressed, sick, discouraged or strongly defensive. Act quickly and clearly!

Vincent Vuillemin

Luisella Goldschmidt-Clermont (1925 – 2013)

Many people make a great impact through their work, but in most cases this effect fades over time. For Luisella Goldschmidt-Clermont, this is certainly not the case.



Photo of Luisella taken in 1971 by her young daughter, Martine.

She played an essential role in two areas which remain very important for many of us at CERN: easy access to information about particle physics and the education of our children. But beyond her professional qualities, she was a warm, well-rounded and intelligent person who was blessed with a sense of humour that helped her in many negotiations.

After completing a degree in social sciences at the Université Libre de Bruxelles (ULB), she started work in the Scientific Information Service at CERN in 1954. She was behind the initiative to organise the exchange of article preprints between research centres and to set up a document information infrastructure, which was subsequently adopted on both sides of the Atlantic. In the 1960s,

she played a pivotal role in developing the management of CERN's preprints and those of the SLAC library in the United States. Later this became the Stanford Physics Information Retrieval System (SPIRES), and subsequently what we now call **INSPIRE**.

Many of the people who work at CERN stay only for a few years and then return to their home country. The question of how best to educate their children is therefore one which arises in many families. In the mid-1960s, Luisella set herself the task of finding a solution to this problem, with the support of the Staff Association. Setting up a school to serve the needs of the children of CERN personnel was a challenge. Initially, the response from the CERN Management was lukewarm. CERN's Member State delegates were

extremely cautious about such a project, as they were more aware than the CERN personnel of the administrative complexities.

So it was Luisella, practically single-handedly, who succeeded in creating a public establishment model for the Lycée International in Ferney-Voltaire that would meet the needs of the local French population and include sections for the teaching of other national curricula. This allowed the children of CERN personnel of other nationalities to reintegrate relatively smoothly into their national education systems.

Anybody who has had to deal with a national bureaucracy can appreciate the challenges that Luisella managed to overcome thanks to her creativity. Thousands of children have benefitted from her efforts and continue to do so, and even though Luisella is no longer with us, her work lives on... And in addition to her campaigning work, she completed a doctorate in sociology at ULB on a subject related to this project.

Luisella subsequently left CERN to pursue a career in social sciences at the ILO and other institutions – an activity which was in keep-

ing with her generous nature and humanist ideals, and where she continued to make a real difference. With Luisella's passing, we have lost a person who always made a difference.

Her friends and colleagues at CERN

To read Luisella Goldschmidt-Clermont's 1971 doctoral thesis ("Contribution à l'étude des problèmes posés par l'intégration européenne - La scolarisation des enfants de fonctionnaires du CERN"), click [here](#).



Official news

Adjustment of the Internal Tax Scale

In application of Article R V 2.03 of the Staff Regulations, the internal tax scale has been adjusted with effect on 1 January 2012.

The new scale may be [consulted](#) via the CERN Admin e-guide.

The notification of internal annual tax certificate for the financial year 2012 takes into account this adjustment.

HR Department (Tel. 73907)

Taxation in Switzerland

Memorandum concerning the 2012 internal taxation certificate and the 2012 income tax declaration forms issued by the Swiss cantonal tax administrations.

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 federal, cantonal and communal 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, will be available on 25 February 2013. It is intended exclusively for the tax authorities.

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

- 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 link: 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 service-desk@cern.ch.

II - 2012 income tax declaration forms issued by the Swiss cantonal tax administrations

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-ch.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.

*HR Department
Contact: 73903*

Annual adjustments to 2013 financial benefits

In accordance with recommendations made by the Finance Committee and decisions taken by Council in December 2012, no adjustments have been made to basic salaries and stipends, subsistence allowances or family benefits as at 1 January 2013.

HR Department

Change of offices for HR Department - disrupted service during the last week of February 2013

HR Department would like to inform that, due to office renovation work, a number of HR Services currently located on the ground, first and second floors of Building 5 will move to temporary offices as from late February.

The removals will take place from Friday 22 until Tuesday 26 February 2013 inclusive and during this period, telephone and e-mail contact may be disrupted.

The following services will be relocated to:

Building 510 – ground floor (until mid-June)

- Head of Department and Deputy
- Office of the Head of HR Department
- Group Leaders and Partners
- Diversity Office
- HR Legal Section

Building 652 – Prefab/Algeco (until September)

- HR Advisors and assistants
- Staff Recruitment Service
- Fellows & Apprentices Service
- Students & Associates Service

Temporary office numbers will be available in the CERN phonebook. Any emergencies during the removals may be addressed to Lynda.Leroux@cern.ch

Thank you in advance for your understanding.

HR Head Office



Take note

The 36th CERN School of Computing visits Cyprus: Apply now!

CERN is organising its Summer Computing School for the 36th time since 1970. CSC2013 will take place from 19 to 30 August in Nicosia, Republic of Cyprus, which was admitted last autumn as an Associate Member in the pre-stage to Membership of CERN.

The CSCs aim at creating a common technical culture in scientific computing among scientists and engineers involved in particle physics or in sister disciplines.

The two-week programme consists of 50 hours of lectures and hands-on exercises. It covers three main themes: **data technologies**, **base technologies** and **physics computing**, and it particularly addresses:

- Many-core performance optimization
- Concurrent programming
- Key aspects of multi-threading
- Writing code for tomorrow's hardware, today
- Storage technologies, reliability and performance
- Cryptography, authentication, authorization and accounting
- Data Replication, caching, monitoring, alarms and quota
- Writing secure software
- Observing software with attacker's eyes
- Software engineering for physics computing
- Statistical methods and probability concepts in physics-data analysis
- Monte Carlo method
- Multivariate analysis and visualisation
- Hypothesis testing as exemplified by recent HEP discoveries

The CSC is not a conference but a true summer university. The focus is on delivering academic knowledge rather than know-how, which can be better achieved through training at home institutes. To maximize coherence and consistency, only a few lecturers participate, and all the non-CERN lecturers are university professors. Like any university, CSC delivers a diploma. Since 2002, 612 students have successfully passed the final examination and received the highly recognized CSC Diploma.

In addition, since 2008, the quality of the CSC programme and lecturers, and the examination process have been audited by the hosting university. In 2013, for the sixth

consecutive year, the audit was successfully passed and successful participants will be awarded European Certificates of Credits (ECTS) by Cyprus University.

Networking and socialization is the other goal of CSCs. One vehicle for social networking is the **CSC Sports** Programme, which proposes two to three hours of **sport every afternoon** to those who are interested. Sports at CSC is supported by the CERN Medical Service and is part of CERN's **Move! & Eat better** programme. Apply now! The deadline is 1 May.

François Fluckiger, CSC Director

CERN openlab Summer Student Programme

CERN openlab is currently taking applications for its summer student programme. The closing date for applications is 31 March 2013.

The openlab summer student programme is open for applications from bachelor, master and PhD students in computer science and physics. Successful applicants will spend 9 weeks at CERN, during the period from June to September 2013, working with some of the latest hardware and software technologies.

The programme is more than just a summer at CERN: it can lead to follow-on projects at the home institute and may even inspire students to become entrepreneurs in cutting-edge computing technologies. A series of lectures will be given by experts in various domains of CERN-related high-throughput computing. Study tours of external companies and universities as well as of CERN facilities are also part of the programme.

CERN restaurant opening times during the Easter weekend

- Restaurants No. 1 and No. 3 will be closed from Friday 29 March to Monday 1 April 2013 inclusive.
- Restaurant No. 2 will be open from 7.00 a.m. to 5.30 p.m. on Friday 29 March. It will be closed from Saturday 30 March to Monday 1 April 2013 inclusive.
- Building 40 will be open from 8.30 a.m. to 8.00 p.m. on Friday 29, Saturday 30, Sunday 31 March and Monday 1 April 2013.

Move! Eat better: news

Are you curious to know whether you're doing enough daily exercise...? Test yourself with a pedometer!

Through the **Move! Eat better** campaign, launched in May 2012, the CERN medical service is aiming to improve the health of members of the personnel by encouraging them to prioritise physical activity in conjunction with a balanced diet. Various successful activities have already taken place: relay race/Nordic walk, Bike2work, Zumba and fitness workshops, two conferences ("Physical activity for health" and "Good nutrition every day"), events in the restaurants, as well as posters and a website.

Although everyone has got the message from our various communications that physical activity is good for your health, there is still a relevant question being asked: "What is the minimum amount of exercise recommended?" 10,000 steps per day is the ideal figure, which has been demonstrated as beneficial by scientific studies on this subject. So that you can see how many steps you are doing yourself, the medical service invites you to rent a pedometer, available from the infirmary.

The Medical Service can provide you with a pedometer. Call us on 73802 or send us an e-mail to reserve a pedometer: **infirmary.service@cern.ch**

Civil engineering work to raise the level of Route Goward

Civil engineering work to raise the level of Route Goward will take place during Long Shutdown 1. The work will begin on 18 March 2013 and is expected to last around 5 months.

Route Goward runs over the top of the PS tunnel and is the only access route to the inside of the ring. The layer of shielding backfill beneath this road is the thinnest anywhere on the PS ring. As the purpose of this shielding is to protect against the ionising radiation emitted by the accelerator when in operation, this road has been classified as a "supervised radiation area" according to radiation protection regulations. This classification was merely a temporary solution and, on the recommendation of the PS Radiation Working Group (PSRWG), the decision has been taken to raise the surface level permanently by around 2 m in order

to increase the thickness of the shielding and thus lower the dose rate to that of a non-designated area.

As the PS tunnel itself is unable to withstand the weight of the additional depth of backfill, a bridge of reinforced concrete will be built to bear the extra load. Raising the ground level above the PS tunnel will also require a stretch of road of approximately 100 m to be raised and supporting walls to be constructed along the side of the road. However, the layout of the future road will be the same as it is now, with two lanes of traffic, each 2.9 m wide. At around 9.5% in gradient, it will be steeper than the current gradient of 6.3%.

The first phase of work, lasting around three weeks, will consist of constructing a 3 m-wide non-asphalted temporary access route with a 10% gradient. This phase of work will not affect users, except that only one lane of the road will be open while the work is in progress.

Route Goward will be completely closed from mid-April while the work takes place. The temporary access route will then be available to CERN users, but for safety reasons, use of this road will only be authorised for the transportation of equipment and deliveries and for emergency services. Pedestrians will be required to use the alternative routes provided and will have to park their vehicles outside the PS ring. In addition, the temporary access route will also be closed for an estimated period of around two weeks and will be open for use only during certain specified time slots, which will be communicated to users.

We thank you in advance for your patience and co-operation while the work is underway.

GS-SE Group

Safe use of nanomaterials

The use of nanomaterials is on the increase worldwide, including at CERN. The HSE Unit has established a safety guideline to inform you of the main requirements for the safe handling and disposal of nanomaterials at CERN.

A risk assessment tool has also been developed which guides the user through the process of evaluating the risk for his or her activity. Based on the calculated risk level, the tool provides a list of recommended control measures.

We would therefore like to draw your attention to:

- Safety Guideline C-0-0-5-Safe handling and disposal of nanomaterials; and
- Safety Form C-0-0-2 - Nanomaterial Risk Assessment

Please contact the HSE Unit for any questions you may have.

The HSE Unit

Physics Colloquium | 25 March

The Standard Model of Nature: Lessons from Two Success Stories, Prof. Gabriele Veneziano, Collège de France (Paris) and CERN.

Monday 25 March 2013, 5 p.m.

École de Physique, Auditorium Stueckelberg
24, quai Ernest-Ansermet, 1211 Genève 4

Abstract: Our present standard model of Nature is based on general relativity for gravity and on a gauge theory for all other fundamental interactions. Its amazing successes - and its puzzles - may carry some important lessons for our quest of a truly unified theory of space, time, and matter.



Safety Training - places available in March 2013

First-Aiders – Basic course

21-MAR-13, 8.15 – 17.30, in English
28-MAR-13, 8.15 – 17.30, in French

Habilitation électrique personnel électricien basse et haute tension

(habilitation électrique for electricians in low and high voltage)
11-MAR-13 to 22-MAR-13 (total hours : 32),
9.00 – 17.30, in English

Habilitation électrique personnel non électricien (electrical habilitation for non electricians)

27-MAR-13 to 28-MAR-13, 9.00 – 17.30, in French

Pontier-élingueur (Crane driving)

25-MAR-13 to 26-MAR-13, 8.30 – 17.30, in French with handouts in English

Radiological Protection - Controlled Radiation Area - Course A for CERN employees and CERN associates

25-MAR-13, 8h30 – 17h00, in English
26-MAR-13, 8h30 – 17h00, in French

Refresher course Self-Rescue Mask training

25-MAR-13, 8.30 – 10.00, in French
25-MAR-13, 10.30 – 12.00, in English

Recyclage - Habilitation électrique personnel électricien basse tension

(refresher course electrical habilitation for electricians in low voltage)
25-MAR-13 au 26-MAR-13, 9h00 – 17h30, in French

Safety in cryogenics – level 1

26-MAR-13, 9.00 – 12.00, in English

Self-Rescue Mask training

21-MAR-13, 8.30 – 10.00, in English
21-MAR-13, 10.30 – 12.00, in English
26-MAR-13, 8.30 – 10.00, in French
28-MAR-13, 8.30 – 10.00, in English
28-MAR-13, 10.30 – 12.00, in English

Working at heights - Using a harness to prevent falling from a height

21-MAR-13, 9.00 – 17.30, in English



Seminars

WEDNESDAY MARCH 20

ISOLDE SEMINAR

10:30 Statistical tools for nuclear experiments (3/4)

DR. KARSTEN RIISAGER (AARHUS UNIVERSITY (DK))

CERN (26-1-022)

TH COSMO COFFEE

11:30 TBA

JAN HAMANN (UNKNOWN)

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

TH STRING THEORY SEMINAR

11:30 Sensitive, unstable and turbulent vacua

ALEXANDER POLYAKOV (PRINCETON UNIVERSITY)

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

TH THEORETICAL SEMINAR

14:00 Reserved

(4-3-006 - TH CONFERENCE ROOM)

THURSDAY 21 MARCH

BLACK HOLE HORIZONS AND QUANTUM INFORMATION

08:00

CECILE GRANIER (CERN)

TH CONFERENCE ROOM

ISOLDE SEMINAR

10:30 Statistical tools for nuclear experiments (4/4)

CERN (26-1-022)

FRIDAY 22 MARCH

GENEVA UNIVERSITY SEMINARS

11:30 TBA

TUESDAY 26 MARCH

LHC Seminar

11:00 Searches for natural supersymmetry with the ATLAS detector

IACOPO VIVARELLI (ALBERT-LUDWIGS-UNIVERSITAET FREIBURG (DE))

CERN (503-1-001 - COUNCIL CHAMBER)

WEDNESDAY 27 MARCH

TH COSMO COFFEE

11:30 TBA

DR. THOMAS KONSTANDIN (DESY)

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

TH THEORETICAL SEMINAR

14:00 First Planck results and cosmological implications

JULIEN LESGOURGUES (CERN AND ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE)

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



Management & Communication training

Management and communication courses – places available

There are places available in some management and communication courses taking place in the period March 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 time	22 March, 26 April, 28 May	3 days	English	8 places
Managing stress	29 and 30 May	2 days	English	4 places
Communicating to Convince	28 and 29 May	2 days	French	8 places
Handling difficult conversations (Adapted from Dealing with Conflict)	7, 14 June and 13 September	3 days	English	3 places
Personal Awareness & Impact	4 to 6 June	3 days	English	8 places
Voice and Nonverbal Behaviour in Speech Communication	17 and 18 June	1 day 4 hours	English	9 places
Communicating Effectively - Residential course	4 to 6 June	3 days	Bilingual	8 places
Introduction to Leadership	10 to 12 April	3 days	English	4 places
Managing Teams	18 to 20 June	3 days	English	5 places
Quality Management	08 to 9 July	2 days	English	8 places

Cours en français	Session	Durée	Langue	Disponibilité
Les enjeux de la voix et du comportement non verbal dans la communication orale	21 au 22 mai	1 jour 4 h.	français	7 places
Savoir gérer les discussions difficiles	15 et 22 mai et 26 juin	3 jours	français	9 places
Techniques d'exposé et de présentation	29 et 30 avril et 12 juin	3 jours	français	6 places
Gestion du stress	5 et 6 juin	2 jours	français	4 places