CERN Bulletin

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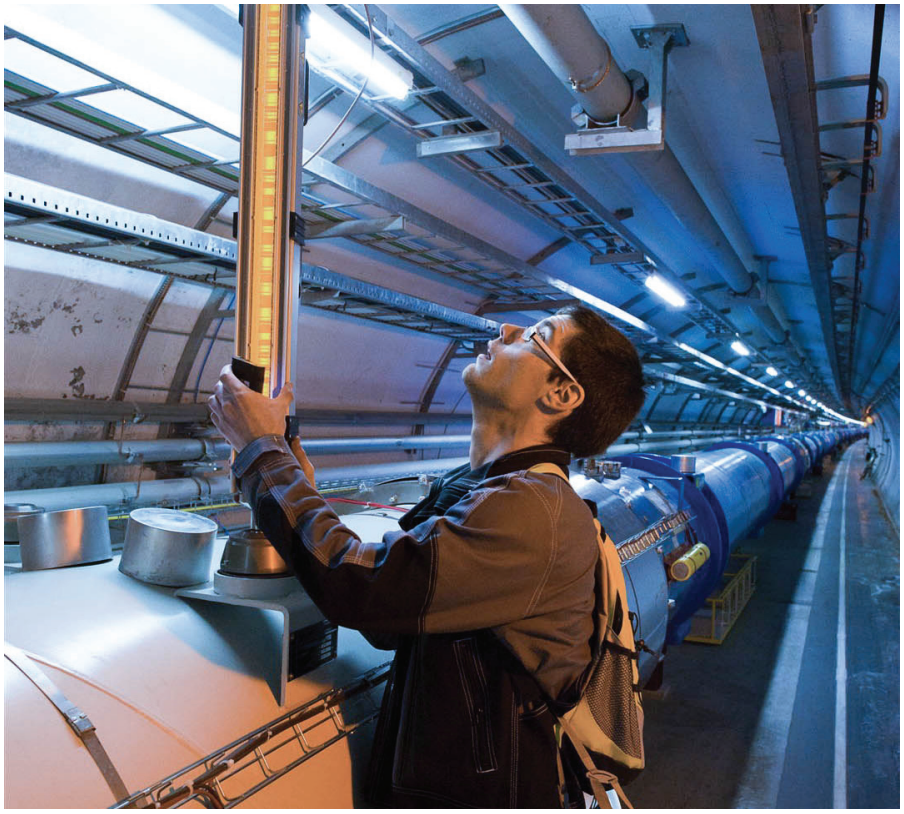
The LHC at level best



CERN surveyors take levelling measurements of the LHC magnets during LS1.

On 10 March, a team of CERN surveyors descended into the LHC tunnel. Their aim: to take measurements of the height of the LHC magnets to see how geological shifts might be affecting the machine and to take reference positions of the machine before the interconnects are opened.

The LHC tunnel is renowned for its geological stability: set between layers of sandstone and molasse, it has allowed the alignment of the world's largest accelerators to be within sub-millimetre precision. But even the most stable of tunnels can be affected by geological events. To ensure the precise alignment of the LHC, the CERN survey team performs regular measurements of the vertical position of the magnets (a process known as "levelling").

Over the past month, the team has been taking measurements of the LHC before the temperature of the magnets reaches 100 K, beyond which there may be some mechanical movements. As no data could be gathered while the machine was in operation, these measurements will provide the clearest picture yet of the machine's position at the end of the run. The team used a so-called "fast levelling" technique, which involves measuring every second magnet in order to complete

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A bountiful spring harvest

Although we recently put the clocks forward and spring has officially begun, the view from my window looks more autumnal – befitting of the season of mists and mellow fruitfulness, rather than that of sowing seeds for the future. Which, in a way is appropriate. With the LHC paused, we are reaping a kind of harvest in the form of recognition for our efforts.

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In this issue

News

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A bountiful spring harvest

Two weeks ago, I was in Edinburgh, on behalf of everyone at CERN, to collect the Edinburgh medal, which we shared with Peter Higgs. I particularly like the citation for this honour: "The Edinburgh Medal is awarded each year to men and women of science and technology whose professional achievements are judged to have made a significant contribution to the understanding and well-being of humanity." I like this, because it underlines a fact that needs to be shouted louder – that fundamental science does more than build the sum of human knowledge, it is also the foundation of human well-being.

A few days before my trip to Scotland, seven scientists from the LHC and its experiments, again representing everyone involved with CERN, were awarded the Special Fundamental Physics Prize in a ceremony presided over quite brilliantly by renowned actor Morgan Freeman, who managed to conjure up an evening that brought a touch of Hollywood glamour to our world. The harvest continues next week with the presentation of the EPS Edison Volta Prize, for which I also much like the citation: "Building on decades of dedicated work by their predecessors, the 2012 EPS Edison Volta Prize has been awarded to [Rolf Dieter Heuer, Sergio Bertolucci, and Stephen Myers], for leading the culminating efforts in the direction, research and operation of the CERN Large Hadron Collider (LHC), which resulted in many significant advances in high energy particle physics, in particular, the first evidence of a Higgs-like boson in July 2012." The award ceremony in Strasbourg will be followed by an event at the Centro Volta in Italy on 13 April.

But while recognition of our collective effort is of course satisfying, I'd like to end where I began, in Scotland, with a quote from Robert Louis Stevenson, who wisely counsels us: "Don't judge each day by the harvest you reap, but by the seeds that you plant." As we reap a bountiful harvest from the LHC's first three years of running, we are sowing the seeds for a bright future at our flagship facility.

Rolf Heuer

The LHC at level best

(Continued from page 1)

the survey as quickly as possible and to reduce the influence of the environmental conditions (temperature gradients, air currents, etc.) that affect the observations made with an optical level. At these points, technicians were able not only to measure the height of the magnets but also to make immediate height comparisons with the previous magnets. No magnet realignments are being carried out at this stage.

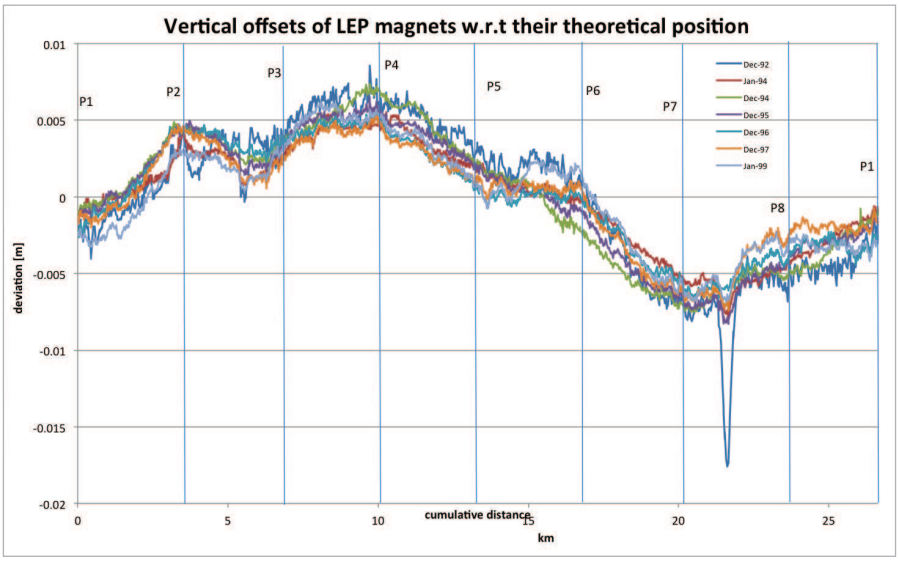
"By comparing these measurements with the base measurements taken during the 2008-2009 shutdown, we will soon have an accurate picture of how ground disturbances may have affected the machine," explains Dominique Missiaen, leader of the BE Department section responsible for large-scale metrology. "This comparison will also help us predict possible future deviations and deterioration of the relative positions between magnets."

The next series of levelling measurements will be taken at the end of the first long shutdown, once the work on the LHC interconnects has been completed. Technicians will then perform complete levelling measurements of the machine, measuring every LHC magnet and adjusting the magnet heights when they see significant variations. "The main aim of this levelling is not to have perfect measurements of the height of the machine, but rather to have an accurate evaluation of each magnet with respect to its neighbours," says Dominique. "We will ensure the magnets are all smoothly aligned for the restart of the machine, as even the smallest of differences can affect the beam orbit."

Katarina Anthony

Levelling LEP

During the LEP era, levelling measurements were taken in the tunnel every year. In 1992, the first measurements revealed significant ground movement in the middle of Sector 7-8 that had shifted the LEP magnets down by some 18 mm. Over the course of 2-3 years, about 100 magnets had to be manually adjusted to compensate for this movement until the "fault" had been corrected and a "smoothed position" for the magnets had been achieved. The phenomena reappeared during the first measurement of the LHC magnets in 2007 and, consequently, this sector is measured and realigned every year during the winter technical stop.



Vertical movement of LEP magnets, which were corrected for during every annual shutdown.

LS1 Report: across the accelerator complex

The warm-up of the first LHC sector (5-6) is now complete; it is at room temperature for the first time in over three years. Next week, the W bellows in this sector will be opened in preparation for the consolidation of the superconducting circuits, splices and interconnections (the SMACC project). Elsewhere in the LHC, the ELQA tests and the warm-up of the remaining seven sectors are proceeding as planned.

The SPS magnet test programme was completed on 26 March and work has already begun in the SPS tunnel. Among the activities being carried out is the installation of 16 specially coated vacuum chambers in the SPS main dipole magnets around BA5. The first of these dipole magnets were removed from the SPS tunnel today, Friday 5 April. By reducing the build-up of electron clouds around the LHC beam during acceleration in the SPS, this activity will play a key role in the increase of LHC beam intensity.

Vacuum leak tests are performed on the magnets before the LHC is brought up to ambient temperature.

Over at the PS, the removal of the old ventilation system is in full swing. This is a very delicate operation, as some of the old ducting contains traces of asbestos. A specialised company is in charge of this task, under the supervision of EN/CV. Work is well under way at the PS Booster to change its multi-pole corrector power supplies. The modification of its cabling and installation racks has also started. Meanwhile, in the AD Hall, preparations have begun on the construction of the new building 393, which is part of the ELENA project. The LEIR machine remains closed for hardware tests, primarily involving new control hardware for the power converters.

Finally, it should be noted that from Monday 8 April access to the PS "centre anneau" area via Route Goward will be limited due to civil engineering work to reinforce the radiation shielding above the PS ring. A temporary access road has been put in place, while the existing road is raised to accommodate the additional shielding. Access for private cars will no longer be possible, and access for material deliveries will be restricted.

Simon Baird

Modernisation of the CERN operational dosimetery system

As part of continual efforts to ensure the highest standards in the field of Radiation Protection, CERN is modernising its operational dosimetry system.

Pierre Carbonez, head of the Dosimetery and Instrument Calibration Service, with one of the new automatic operational dosimetery reader terminals.

No more sheets of paper to record radiation doses at the entrance to the accelerators: the operational dosimetry system is being modernised! Since March, 50 automatic operational dosimeter reader terminals are in operation around the accelerator complex.

Operational dosimeters (DMC) complement the "passive" dosimeters (DIS) and must be used every time you enter Controlled Radiation Areas. They measure the dose of radiation received by the exposed worker in real time and give a warning if the acceptable threshold is exceeded.

The new dosimeter reader system allows the dosage recording procedure to be automated. "Every person who has to work in accelerators areas at CERN is required to make an access request via an IMPACT form, which contains the radiological data (along with other information) related to the work. They must then activate their dosimeter by inserting it into the reader terminal at the

entrance of the area," explains Pierre Carbonez, head of the Dosimetry and Instrument Calibration Service. "The terminal will then switch on the dosimeter, which will display the radiation dose throughout the work. At the end of the job, the operator must read the dosimeter by inserting it again into the terminal, which will record the value of the dose received during the operation in the database and switch the dosimeter off."

This new system considerably improves employee safety and follow up, enabling Radiation Protection Officers to check radiation doses in real time. Each request in IMPACT is submitted to the Radiation Protection Service, who, depending on the worker's previous exposure and the work to be carried out, will set a maximum dose. If this dose is reached during the intervention, the dosimeter gives an alarm to warn the operator to stop the work and leave the area. In addition, as the exposure data is directly recorded in a database, it will be possible to analyse the work more thoroughly, with more precise statistics.

"Installation of the 50 terminals began in September 2012," adds Pierre Carbonez. "The objective was to be operational by the start of LS1, so we only had six months to put everything in place. The biggest difficulty in this project was not with the configuration and parameterization of this complex system, which is already well understood, but rather the tight time schedule to connect our terminals to the electricity supply networks and the Intranet. Thanks to the great work of all involved groups problems could be solved in time and the new system is now operational since March. The old system is being used in parallel for two weeks of testing but will be decommissioned and CERN will then have the biggest installation of this type in the world."

We're modernising for your safety!

Caroline Duc

VIP access for Very Important Particles

From 12 to 14 March, 100 data acquisition specialists from ALICE, ATLAS, CMS and LHCb took part in a workshop* to share their experiences and exchange ideas. This gave the Bulletin the opportunity to take another look at some of the principles of data acquisition.

The more debris, the better: at least when it comes to particle collisions. The LHC does marvellously well in this respect, but the four main experiments have another aim: detection. Every second, millions of protons interact with millions of others, creating a chaotic torrent of secondary particles. The picture is extremely complex, much to the joy of the physicists, who hurry around trying to "maybe" register the event…

Event or non-event?

That is the question. Gathering data is good, but gathering the best data is better. Fortunately, thanks to the "trigger system", it is possible to isolate the data we're looking for. Initially, all new data are recorded. The recording is very quick – just a few microseconds – which is just long enough for the trigger system to evaluate the quality of the event. If it is judged to be of poor quality, the data are deleted, otherwise the event moves on to a second finer sorting phase. Then, if it still makes it through the mesh of a final net, it is permanently recorded.

Reconstructing the puzzle

Once the data are sorted, the reconstruction phase can start. But how can we determine which elements come from the same event? To identify the data, researchers use the LHC's clock, which is accurate to 25 ns and allows them to give a time "barcode" to each element in the data. All that remains is to group together the data with the same barcode. The computers then take care of reconstructing the corresponding event. Finally, this information is sent to the CERN Computer Centre, where it is stored on tapes.

Ever more powerful detectors

During LS1, some improvements will be made to the four experiments' data acquisition systems, but the major changes will mostly take place in 2018 (LS2) and 2022 (LS3). During LS2, ALICE will switch to continuous readout from its most important detectors, which will correspond to an increase in the recording rate by a factor of 100 or, to put it another way, the experiment will be able to analyse 100 times as many events as it can at present. In parallel, its data storage capacity will be increased by a factor of 20, to reach 80 GB/s. The LHCb experiment will increase its readout rate by a factor of 40 and will thus eventually rely totally on software trigger algorithms. During LS2 and LS3, ATLAS and CMS will need to prepare for an increase in instantaneous luminosity by a factor of 10-20 and a corresponding increase in the number of simultaneous interactions.

To keep up with these increases, ATLAS and CMS plan, among other things, on the upgrade of their respective tracking detectors, to incorporate track information into their upgraded trigger systems. This would enhance their ability to select the best data. They are also proposing to increase the readout rate by a factor of 5 and increase the rate at which collisions of interest are recorded to mass storage. These changes will in turn require significant upgrades to the DAQ systems to deal with the movement of data to and from the second level of selection and subsequently to mass storage.

Participants in the data acquisition workshop held at Château de Bossey in March. Image: Andrei Kazarov.

Anaïs Schaeffer

*The workshop was organised at the Château de Bossey Ecumenical Institute on the initiative of those responsible for the acquisition of data in the four experiments (David Francis, Beat Jost, Frans Meijers and Pierre Vande Vyvre).

The Passport to the Big Bang: a trail of discovery of CERN and its sites

Sunday 2 June 2013 will see the launch of CERN's Passport to the Big Bang, a scientific tourist trail linking ten of the Laboratory's sites in the Pays de Gex and the Canton of Geneva. CERN is organising a public event to celebrate the launch and needs lots of volunteers – you could be one of them!

Does your grocer insist that the Pays de Gex is going to be swallowed up by a black hole made by the LHC? Do your neighbours ask you questions about the CERN site visible from your houses, leaving you stumped when you don't have the answers? Well then, take them on an accelerator tour – but above ground and with no need for access cards! How? By taking advantage of the Passport to the Big Bang, a cross-border scientific tourist trail that will be inaugurated on 2 June.

The goal of the Passport to the Big Bang is provide the local population with more information about the activities taking place on the various CERN sites scattered across the countryside of the Pays de Gex and the Canton of Geneva. Local residents pass by these sites on a daily basis and yet rarely know what's going on inside. This new trail comprises exhibition platforms at ten CERN sites. Situated just outside the fenced sites and therefore accessible to the public, the platforms explain the research being conducted every day at CERN and its impact on everyday life. The sites span eight French and Swiss communes and are connected by 54 kilometres of signposted paths, so now you can set out on foot or by mountain bike, along with your neighbours and your grocer, to (re)discover the region, while at the same time learning what goes on behind the scenes at CERN.

Each platform is equipped with a telescope just like the ones found at tourist spots and features a video animation, playable in a choice of French or English, that introduces one of the scientific topics studied at CERN. Younger (or not-so-young) visitors can also take part in an online game called the "LHC Mission" using the interactive terminals located on each platform. All the information you need about the trail as well as puzzles and maps of the route can be found in the "Passport to the Big Bang" leaflets, which will be available from the CERN Reception, town halls and tourist offices and will be downloadable from the project's dedicated website.

The trail will be inaugurated with a large public event encompassing the route's ten sites on Sunday 2 June 2013 to coincide with the Fête des Voisins. Everyone who lives in the region is invited to come along and join in the fun, learn more about CERN and test their skills. In the morning, you and your kids will all have the opportunity to take part in a family bike ride, or the more athletic among you will have the chance to try out the 54-km route in a timed mountain bike rally. In the afternoon, CERN scientists, educational establishments and local clubs and associations will offer a variety of activities across the ten sites: why not have a go at building the CMS detector out of Kapla blocks, join a Zumba class, try your hand at Arabic calligraphy or take a ride on an electric bike?

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The exhibition platform in Sergy, in front of the ALICE experiment.

All the information about the cycle route and the inauguration can be found on **www.passeportbigbang.org**. News about the event is also published on the CERN Facebook page, under Events.

Call for volunteers

The Passport to the Big Bang team is looking for volunteers to organise activities, supervise or help in any way at the launch. Come and spend a few hours acting as a steward for the cycle rally or welcoming the public. For more information and to sign up, please go to: **www.passeportbigbang.org**.

We're counting on you!

September 2013: the doors open

Three special days and one public open day: at the end of September our Laboratory will open its doors to visitors from CERN, the local region and all over the world. With over 150,000 visitors expected in total, the organisation of the OpenDays is a challenge that a core team of eleven people have taken up with enthusiasm.

They come from several departments but share one goal: making the last four days of September an unforgettable experience for all the visitors who will come to discover the Laboratory and its scientists. The core team in charge of the organisation of the events is co-ordinated by Hermann Schmickler. "The events are an opportunity for us to celebrate the discoveries, the excellent performance of the technical installations and the vital contribution of all the CERN personnel, the thousands of users and those working under support contracts," says Hermann Schmickler.

The four-day programme will start on Friday 27 September with an "Industry day" dedicated to CERN's industrial partners and a few other guests. It will continue on the Saturday with an entire day reserved for CERN people and their families. Sunday 29 September will be the public open day during which over 100,000 visitors are expected on the various CERN sites. "For the CERN and public days, we are planning a rich programme of activities above ground in addition to visits to seven underground points, of which six will be around the LHC," explains Sascha Schmeling, deputy co-ordinator of the events. "Given the limited capacity of the installations, the underground visits will only be possible with tickets that will be reservable online free of charge."

Bosons&More is the name that has been given to the event organised on Monday 30 September to celebrate in music the recent discoveries with the people who made them possible. "The official speeches by the Management will be followed by a big party on the Prévessin site at which a variety of 'multicultural food' partly provided by the Member States will be on offer," explains Hermann.

Going back to figures, with over 150,000 visitors expected over the four days, more than 20 activity points on site and seven underground visit itineraries, you don't need to be a Nobel laureate in physics to imagine the number of volunteers who will be needed. "The volunteers and their dedication will be vital to the success of the events," says Virginie Blondeau, who is in charge of the volunteer programme. "In recognition of their contribution we will organise food and some small gifts, and about two weeks after the event we will hold a small reception for them." The call for volunteers will open on 3 May, when a dedicated Bulletin article will give you the starting signal: ready, steady…

Antonella Del Rosso

Visit the CERN OpenDays website: **http://cern.ch/opendays**

Spring report of the Pension Fund

In this column, the Chairman of the Pension Fund Governing Board (PFGB) presents the Board's latest main decisions, initiatives and accomplishments to the Fund's members and beneficiaries.

Since my last report in December, significant progress has been made on a number of issues concerning both the governance and the asset management of the Pension Fund.

At its meeting in February 2013, the PFGB received a report by the Fund's actuary showing that the estimated funding ratio of the Pension Fund had increased by 2.2 points during 2012 to reach 65.7% at the end of the year. Definitive results will be available in the Financial Statements of the Fund, which will be published in June.

The increase in the funding ratio was principally due to asset returns exceeding the objective in 2012 and to the non-indexation of pensions. The 6.89% return on assets exceeded the Fund's return target of 3% above Geneva inflation by 3.89 percentage points, as inflation was zero in Geneva in 2012. It is worth noting that the Fund exceeded its investment mandate while maintaining a prudent risk level throughout the year, in compliance with the set risk tolerance level.

Also in February, the Fund completed a major overhaul of the structure of its investment governance. For the first time in the Fund's history, a full set of investment guidelines has been approved. The Fund now has a set of appropriate investment principles, which incorporate risk control and risk management processes. These processes are aligned with the objectives and risk tolerance that are set by the Governing Board, and are documented in the Internal Control System.

The PFGB successfully concluded the tendering process for the new provider of internal audit services to the Pension Fund by approving the bid by Mazars Switzerland, the Swiss office of the French firm specialising in audit, accountancy and advisory services. Services to be provided will include the annual audit of the Financial Statements of the Fund, and the annual audit of the Fund's Internal Control System. The contract will initially be signed for a period of three years, including options for up to two one-year extensions.

The PFGB also approved the work plan and timeline for the preparation of the 2013 actuarial study. The first presentation to the PFGB is scheduled for September 2013, and the first presentation of results to Council by the Actuary has been tentatively scheduled for December 2013.

Dan-Olof Riska
Chairman, Pension Fund Governing Board

Computer Security
Sécurité informatique

Creativity@CERN

Aren't we innovative and creative people? Building complex accelerators and doing sophisticated physics analysis is not easy and requires a lot of excellent brains. Some items of hardware are pure works of art, worthy of a place in an art museum. Some software takes advantage of all the finesse of computer science to optimize every last bit of computing power. So, yes. We are. Innovation and creativity are our middle names.

But I wonder why these splendid characteristics are lost when dealing with passwords? Recent computer security scans have found a series of unprotected passwords and, I hope you agree, "Operator1", "SamFox" or "Admin123" do not reflect our innovative nature (and might even be taken as an insult). I believe we can do much better than that and encourage you to be Creative@CERN!

So take up this small challenge. I am sure you can do better than your colleagues! Your good password, however, must be private (used and known by only one person); secret (it must not appear in clear text in any file or program, or on a piece of paper pinned to the monitor); easily remembered (so there is no need to write it down); at least 8 characters long with a mixture of at least three of the following: upper case letters, lower case letters, digits and symbols. It must not be listed in a dictionary of any major language; and not guessable by any program in a reasonable time, for instance less than one week.

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

- Choose a line or two from a song or poem, and use the first letter of each word. For example, "In Xanadu did Kubla Kahn a stately pleasure dome decree!" becomes "IXdKKaspdd!".
- Use a long passphrase like the sentence "InXanaduDidKublaKahnAStately-PleasureDomeDecree!" itself.
- Alternate between one consonant and one or two vowels with mixed upper/lower case. This provides nonsense words that are usually pronounceable, and thus easily remembered. For example: "Weze-Xupe" or "DediNida3".
- Choose two short words (or a big one that you split) and join them together with one or more punctuation marks. For example: "dogs+F18" or "comP!!UTer".

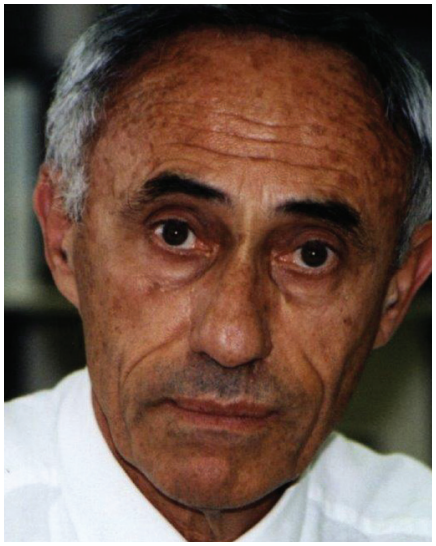
Finally, remember that your "password is your toothbrush": you do not share it and change it regularly. Neither your colleagues, your supervisor, the ServiceDesk or the Computer Security Team have any valid reason to ask for it. They should not and will never do. The same is valid for external companies: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

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

Computer Security Team

Massimiliano Ferro-Luzzi (1932 - 2013)

Massimiliano (Max) Ferro-Luzzi, a well-known CERN physicist, passed away on 18 March. He grew up in Asmara (Eritrea) and studied at Rome University, where he joined the nuclear emulsion group of Edoardo Amaldi and graduated in 1955. His research work was an investigation of antiproton reactions in emulsions exposed at Berkeley's Bevatron. Right from the start, as would be typical throughout his career, he combined careful analysis of data with special attention to technical improvements (the automation of track measurement in this case) and better instruments.



Starting in 1960 Max spent three years at Berkeley in Alvarez's legendary group, where he focussed on the role of kaons in strong interactions. In 1963 he moved to CERN, where he spent the rest of his working life, with the exception of a sabbatical year at SLAC in 1976. As one of the leaders in the Track Chamber division, his most important contribution, using data from bubble chambers, was the discovery and study of baryonic resonances, especially the elucidation of hyperon resonances. These impressive results gave valuable experimental input to the quark models.

In the late 1960s he was among the first to realise the need to move to electronic detectors. From 1970 to 1980, putting together a small group of counter and bubble chamber physicists, he continued to measure low-energy hadron elastic scattering by purely electronic means. In those experiments he pioneered new techniques in multiwire proportional chambers and ultraviolet Cherenkov light detection.

Max then turned for a while to weak interactions and neutrinos, first in 1984 with an experiment at the CERN PS, then in 1986 at the AGS (Brookhaven) using Conversi flash tubes. Later, he conducted tests of the first ICARUS prototype. He then became active in the JETSET experiment at LEAR, which started at the beginning of 1989. He joined the DIRAC collaboration in 1995, heading the CERN group that played an important role in setting up and carrying out the experiment. He also acted as project leader

in the design and implementation of an ionization hodoscope and trigger. Overall, his active participation in the organisation and his guidance of the first steps of this experiment were extremely fruitful.

He was chairman of the Library Committee for a decade starting in 1979, a member of the PS and SC Committee in 1981, and the scientific secretary of the Research Board from 1984 to 1997. He retired from CERN in 1997.

Intellectually rigorous, yet tempered by a degree of pragmatism in interpreting experiments, Max was a keen advocate of linguistic precision, had a highly individual view of the world and cultivated a scathing sense of humour. Max was remarkable for his friends: his death is a hard loss for them.

His colleagues and friends

Talk | Physical preparation before a sports competition | 16 April

In the run-up to the annual CERN Relay Race and as part of the Move! Eat better campaign, the Medical Service is organising a talk on physical preparation before a sports competition or before the start of a sporting season.

Come along to the Council Chamber on 16 April at 5:00 p.m. to discover the secrets of good physical preparation. You'll get plenty of tips, techniques and exercises, and find out how your whole sporting experience can be enhanced by good physical preparation. This advice will be especially useful to help you prepare for the CERN Relay Race, whether you're a casual jogger or a hardened road-racer.

The talk will be moderated (in French) by:

- Rachel Bray, President of the CERN Fitness Club;
- Olivier Baldacchino, professional running coach and trainer of the CERN Running Club, who will give tips on how to prepare for races, in particular the CERN Relay Race;
- and Jean-Yves Le Meur, a member of the French national disabled ski team, who will give a presentation entitled "Preparing for international competitions - sitting skiing as an example".

Thursday 23 May – Take part in the CERN Relay Race!

The race starts at 12:15. Programme: the road race, Nordic walking and a demonstration of handbike. Registration is now open (deadline for entries: 20 May). Click here to enter. The race fee is 10 CHF, of which 1 CHF will go to charity.

Please note that this year individual entries are accepted. The organisers will take care of finding a team for everyone (or find runners for incomplete teams).

The top three in each category will receive prizes, and all participants and helpers will receive a souvenir. New in 2013 – a prize will be awarded for the best team fancy-dress!

Many CERN clubs and associations will be present on the day of the race, showcasing the wide variety of social and sporting activities on offer at CERN.

Call for volunteers

Every year, more than 50 volunteers give the official organisers of the CERN Relay Race a helping hand. If you wish to help, please contact David.Nisbet@cern.ch or Pascal.Fernier@cern.ch. Many thanks!

Catalysed fusion: a very different book about CERN

Not many books get reviews resulting in headlines like "Steamy novel challenges CERN's serious image", "Love and death at CERN" and so on. But Francis Farley's book "Catalysed Fusion" does not leave its readers untouched.

Catalysed fusion: a very different book about CERN

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Those of you who have been around some time will know Farley from when he worked at CERN. For "newcomers", Farley is a well-known physicist who put together the first experiment on the anomalous magnetic moment of the muon and has since taken part in all the experiments relating to this phenomenon.

The back cover of his book reads:

"A sizzling romance and a romp with subatomic particles at CERN. Love, discovery and adventure in the city where nations meet and beams collide. Life in a large laboratory. As always, the challenges are the same. Who leads? Who follows? Who succeeds? Who gets the credit? Who gets the women or the men?

Young Jeremy arrives in CERN and joins the quest for green energy. Coping with baffling jargon and manifold dangers, he is distracted by radioactive rats, lovely ladies and an unscrupulous rival. Full of doubts and hesitations, he falls for a dazzling Danish girl, who leads him astray. His brilliant idea leads to a discovery and a new route to cold fusion. But his personal life is scrambled. Does it bring fame or failure? Tragedy or triumph?"

If you want to meet the author and learn about how this book came to be, come to the Library and join the discussion.

Literature in Focus
Francis Farley presents his book "Catlysed **Fusion"CERN Library (building 52-1-52)**
Tuesday 16 April at 3:30 p.m.
Tea and coffee will be served at 3:15 p.m.

CERN Library

Stress and back pain: who can escape?

On 28 April each year, the International Labour Organization and the World Health Organization organise a World Day for Safety and Health at Work.

For the third consecutive year, CERN will be celebrating the World Day through events and initiatives coordinated by the BE Safety Unit, the HSE Unit, the CERN Medical Service and finally the Fire Brigade.

Two main themes that will be highlighted this year are: work stress and musculoskeletal disorders. These two frightening items actually refer to situations that we may all be experiencing.

On the day of the event, you will be given information and tips on how to reduce daily stress. You will also be invited to follow a "back pain" course that will bring to light all the activities you can try out in order to fight this affliction and reduce its consequences.

The Fire Brigade will also be present to show you how to use the "portoire" chair. Don't know what a "portoire" chair is? Just come along and try it out!

As usual, presents will be distributed and you might have a chance to win an Obox and some Vitam Parc gift cards if you take part in our quiz.

So what about stopping by on **Thursday 18 April between 11.30 a.m. and 2.30 p.m.** and visiting our stands located **in the 3 CERN restaurants.**

CERN Library

CERN Library and Art@CMS present Artist and Painter Xavier Cortada and CMS Physicist Pete Markowitz

Xavier Cortada is an American artist and painter, and an artist in residence at Florida International University (FIU) College of Architecture and the Arts who also specializes in participatory art projects. His work includes art installations at the Earth's poles to generate awareness about climate change, child welfare murals in Bolivia and peace murals in Cyprus.

Xavier will be in conversation with CMS physicist Pete Markowitz, also from FIU, to discuss the participatory art piece which they developed together. The piece will be showcased in the CMS detector hall on Thursday 11 April during the experiment's conference week.

The piece promises to "engage 300 scientists from around the world in a performance art piece that transforms them into the very subatomic particles they research". It is the first piece by Art@CMS, a new project inspired by the Arts@CERN programme.

Discover more about how this new piece was developed and more about Xavier's work by joining him and Pete Markowitz in conversation in the CERN Library on Tuesday 9 April at 4:00 p.m.

For further information about Xavier Cortada, visit his website: **http://www.xaviercortada.com**

CERN Library

Move! Eat better: Do you walk more than 10,000 steps a day?

All of you who borrowed a pedometer from the Infirmary will confirm that it was a useful experience and that, in order to reach your recommended daily tally of 10,000 paces, you need to add about 30 minutes of exercise to your daily routine, which equates to about 4,000 extra paces. Why 10,000 steps?

The slogan "10,000 steps a day" comes from Japan.

But the number wasn't just pulled from a hat - it's based on a study by Dr Yoshiro Hatano. Walking is sacrosanct in Japanese society, where they use pedometers to determine the number of steps they walk every day. Dr Yoshiro Hatano has demonstrated that people who get enough walking in every day have improved health. In other words, you have to burn at least 200 extra calories per day, through exercise, in order to start reaping the benefits in terms of improved health. A 30-minute walk roughly corresponds to the 4,000 extra steps which are recommended but rarely taken.

- Is 10,000 steps an achievable goal?
- You already do about 6,000 steps a day in the course of your daily routine (housework, children, work, etc.) without necessarily going for a walk as an exercise.
- The study by Dr Hatano shows that people who do no other sport or exercise on top of this daily routine need to burn off another 200 calories in order to improve their health. In walking terms, that means an extra 4,000 steps, give or take...
- Put differently, these 4,000 steps equate to a brisk 30-minute walk.
- Every step counts! And it's probably easier than a 30-minute work-out at the gym. Recording the number of steps you take can become an incentive to move more and it gives you a good idea of whether you're doing enough exercise to stay fit, or not...

HR Department
Contact: 73903

Prévessin site – Pedestrian and cycle entrances

A second entrance for pedestrians and cyclists on Route du Maroc will be opened and the existing entrance on Chemin du Moulin des Ponts will be re-opened:

- for the period 2 April to 31 October 2013,
- from 7.00 a.m. to 9.00 a.m. and from 5.00 p.m. to 7.00 p.m. on working days (Monday to Friday).

IMPORTANT: all users must show their access cards to the security guard as a matter of course when passing through the gates, both on entering and leaving the site.

GS-IS

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**

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.

Conduite de plates-formes élévatrices mobiles de personnel (PEMP) (cherry-picker driving)
15-APR-13 to 16-APR-13, 8.30 – 17.30, in French, with handouts in English

Être TSO au CERN
11-APR-13, 9.00 – 17.30, in French

First-Aiders – Basic Course
18-APR-13, 8.15 – 17.30, in French

Habilitation ATEX niveau 2 (ATEX habilitation level 2)
11-APR-13 to 12-APR-13, 9.00 – 17.30, in French

Habilitation électrique personnel électricien basse tension (electricial habilitation for electricians in low voltage)
10-APR-13, 9.00 – 17.30, in French

Habilitation électrique personnel électricien basse et haute tensions (electricial habilitation for electricians in low and high voltage)
15-APR-13 to 18-APR-13, 9.00 – 17.30, in French

Habilitation électrique personnel non électricien (electricial habilitation for non electricians)
15-APR-13 to 16-APR-13, 9.00 – 17.30 (1.5 days), in English
16-APR-13 to 17-APR-13, 9.00 – 17.30 (1.5 days), in English

Laser Users
19-APR-13, 14.00 – 18.00, in French

Radiological Protection - Controlled Radiation Area - Course A for CERN employees and CERN associates
12-APR-13, 08.30 – 17.00, in French
18-APR-13, 08.30 – 17.00, in English
19-APR-13, 08.30 – 17.00, in English

Recyclage – Conduite de plates-formes élévatrices mobiles de personnel (PEMP) (refresher course for cherry-picker driving)
12-APR-13, 8.30 – 17.30, in French

Recyclage - Habilitation électrique personnel non électricien (refresher course for electricial habilitation for non electricians)
19-APR-13, 9h00 – 17h30, en français

Recyclage - Habilitation électrique personnel électricien basse tension (refresher course for electricial habilitation for electricians in low voltage)
18-APR-13 to 19-APR-13, 9.00 – 17.30, in English

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

Risks associated with operations in confined spaces
15-APR-13, 9.00 – 17.30, in French

Safety in Cryogenics – level 2
16-APR-13, 9.00 – 17.30, in English

Self-Rescue Mask Training
11-APR-13, 10.30 – 12.00, in French
16-APR-13, 8.30 – 10.00, in French
16-APR-13, 10.30 – 12.00, in French
18-APR-13, 8.30 – 10.00, in English
18-APR-13, 10.30 – 12.00, in English
23-APR-13, 8.30 – 10.00, in French
23-APR-13, 10.30 – 12.00, in French
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
10-APR-13, 14.00 – 16.00, in French
17-APR-13, 10.30 – 12.30, in English
19-APR-13, 10.30 – 12.30, in French
19-APR-13, 14.30 – 16.30, in English
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

Working at heights - Using a harness to prevent falling from a height
17-APR-13, 9.00 – 17.30, 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 10 APRIL

TH COSMO COFFEE

11:30 TBA

JAN HAMANN (UNKNOWN)

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

THURSDAY 11 APRIL

COLLIDER CROSS TALK

11:00 Chiral-symmetric strongly coupled sectors at the LHC

ROMAN PASECHNIK (LUND UNIVERSITY)

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

TH BSM FORUM

14:00 Custodial Leptons and Higgs Decays

FLORIAN GOERTZ (ETH ZURICH)

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

A&T SEMINAR

14:15 A Roadmap to the Realisation of Fusion Energy

DR. KARSTEN RIISAGER (AARHUS UNIVERSITY (DK))

CERN (26-1-022)

ISOLDE SEMINAR

14:30 Hyperfine techniques studies of surfaces and interfaces using isolated ad-atom probes

ABEL FENTA

CERN (26-1-022)

MONDAY 15 APRIL

A&T SEMINAR

14:15 Summary of the 2013 workshop on beam-beam effects in hadron colliders

R. TATIANA PIELONI (CERN)

CERN (6-2-024 - BE AUDITORIUM MEYRIN)

TUESDAY 16 APRIL

HUPP GROUP - TURKISH STUDENTS MEETINGS

21:00 Next Hupp Meeting

TR

WEDNESDAY 17 APRIL

TH COSMO COFFEE

11:30 TBA

ROMAN PASECHNIK (LUND UNIVERSITY)DR. KWAN CHUEN CHAN (UNIVERSITY OF GENEVA)

CERN (4-2-011 - TH COMMON 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 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

Technical training

Electronics design

	Next Session	Duration	Language	Availability
Altium Designer: Essentials	04-Jun-13 to 07-Jun-13	4 days	English	10 places available
Altium Designer: Front End Specialist (Advanced)	23-Sep-13 to 24-Sep-13	2 days	English	10 places available
Altium Designer: PCB Specialist (Advanced)	25-Sep-13 to 27-Sep-13	3 days	English	6 places available
CAO = Allegro Design Entry HDL Front-to-Back Flow v16.6	04-Jun-13 to 06-Jun-13	3 days	English	5 places available
Effets des Radiations sur les composants et systèmes électroniques	20-Mar-13 to 21-Mar-13	1 day 4 hours	French	8 places available
LabVIEW: High-Throughput FPGA and FlexRIO	22-Apr-13 to 24-Apr-13	3 days	French	9 places available
Siemens - STEP7 : level 1	15-Apr-13 to 18-Apr-13	4 days	English	One more place available
Siemens - STEP7 : level 2	10-Jun-13 to 14-Jun-13	5 days	French	4 places available

Mechanical design

	Next Session	Duration	Language	Availability
ANSYS Workbench advanced	16-Apr-13 to 19-Apr-13	4 days	English	7 places available
AutoCAD - level 1	02-May-13 to 08-May-13	4 days	French	2 places available
AutoCAD Electrical	14-Oct-13 to 18-Oct-13	5 days	French	5 places available
CATIA V5 Kinematics and DMU Fitting	06-May-13 to 07-May-13	2 days	French	6 places available
CATIA-Smarteam Basics	22-Apr-13 to 17-May-13	10 days	French	4 places available
SmarTeam - CATIA data manager at CERN	22-May-13 to 24-May-13	3 days	French	6 places available
SmarTeam - Refresher	21- Mai-13	8 hours	French	2 places available

Office software

	Next Session	Duration	Language	Availability
CERN EDMS for Local Administrators	18-Apr-13 to 19-Apr-13	2 days	English	6 places available
Dreamweaver CS3 - Level 2	25-Apr-13 to 26-Apr-13	2 days	French	5 places available
MS Project - level 1	12-Apr-13 to 19-Apr-13	12 hours	English	One more place available
Sharepoint Collaboration Workspace - Level 1	21-Mar-13 to 22-Mar-13	2 days	French	2 places available
Sharepoint Collaboration Workspace - Level 2	15-Apr-13 to 16-Apr-13	2 days	French	4 places available
Vidyo - Hands on Overview	25-Avr-13	3 hours	French	6 places available
Word: Perfectionnement et charte graphique CERN	18-Avr-13	1 day	French	3 places available

Software and system technologies

	Next Session	Duration	Language	Availability
C++ Part 1 - Hands-On Introduction	13-May-13 to 16-May-13	4 days	English	One more place available
Core Spring	23-Sep-13 to 26-Sep-13	4 days	English	6 places available
Developing secure software	11- Avr-13	3.5 hours	French	22 places available
Drupal Site Editing	22-Apr-13 to 23-Apr-13	2 days	English	6 places available
ITIL Foundations (version 3) EXAMINATION	12-Juin -13	1 hour	English	12 places available
Introduction to Linux	12-Jun-13 to 14-Jun-13	3 days	English	7 places available
JAVA - Level 2	03-Jun-13 to 06-Jun-13	32 hours	English	4 places available
JavaScript for web development	27-May-13 to 29-May-13	3 days	English	5 places available
Joint PVSS-JCOP Framework	01-Jul-13 to 05-Jul-13	4 days 3 hours	English	7 places available
Oracle Certified Professional	17-Jun-13 to 21-Jun-13	5 days	English	4 places available
Oracle Database SQL Tuning	22-May-13 to 24-May-13	3 days	English	7 places available

Special

	Next Session	Duration	Language	Availability
AXEL: Introduction to Particle Accelerators	22-Apr-13 to 26-Apr-13	1 day 7 hours	English	36 places available