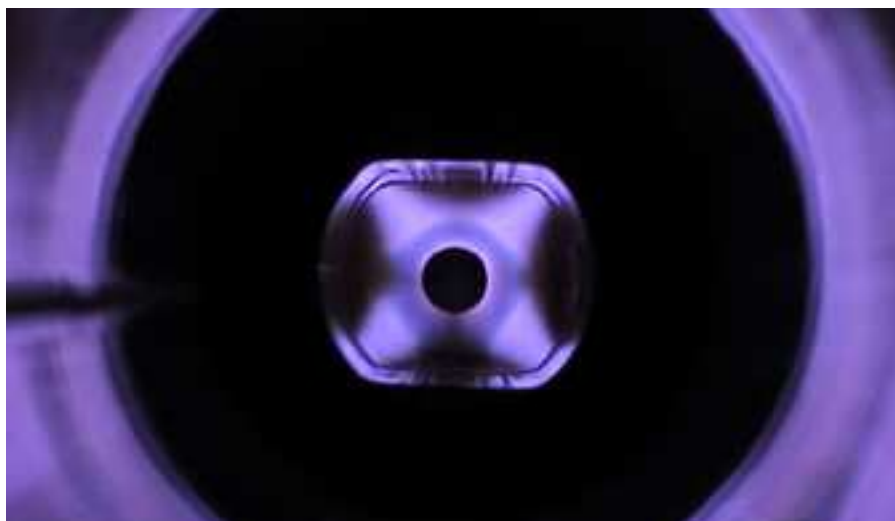


A NEW TYPE OF COATING TO CHASE THE CLOUDS AWAY

The electron cloud problem needs to be addressed with innovative solutions, particularly in view of the rapidly approaching HL-LHC upgrade. CERN's Vacuum, Surfaces and Coatings group has greatly improved its amorphous carbon coating technique, which is an alternative to the scrubbing process used so far. This technique is now fully mature and is being used for the vacuum chambers of the SPS magnets and the delicate beam screens of the LHC's quadrupole triplets.



The violet light is produced by the argon plasma used when sputtering the amorphous carbon. The coating of the beam screen is done in this case using the magnetic field of the quadrupole itself. (Image: Pedro Costa Pinto)

We know that conditioning (or "scrubbing") the beam pipe reduces the avalanche-like creation of secondary electrons from the tube's walls, thus preventing the formation of unwanted electron clouds. But it has also been observed that scrubbing naturally leads to an increase in the concentration of carbon on the pipe's surfaces. "This gave us the idea that applying a thin film of carbon to the walls of the vacuum chamber could provide an alternative solution to beam tube scrubbing," says Paolo Chiggiato, head of the Vacuum Surfaces and Coatings group of the Technology department (TE-VSC).

At the end of 2014, despite the promising results obtained through coating the inner walls of the vacuum chambers of 16 SPS magnets with

a fine layer of amorphous carbon (a-C), there were still some issues to be resolved, including the mysterious origin of some scattering in the secondary electron yield (SEY) rate – i.e. the number of secondary electrons produced on average per incident electron. In the meantime, the management of the HL-LHC project made a request for a study of the feasibility of coating the LHC triplets with carbon to cope with the future HL-LHC beams and the known maximum thermal load of the cryogenic system.

It took the TE-VSC group months of intensive R&D to realise that the presence of even small residual fractions of hydrogen caused an increase in the SEY rate. "The whole operation needs to be carried out in extremely good ultra-

(Continued on page 2)



A WORD FROM THE DIRECTOR-GENERAL

SAFETY FIRST!

Among the many duties I assumed at the beginning of the year was the ultimate responsibility for Safety at CERN: the responsibility for the physical safety of the personnel, the responsibility for the safe operation of the facilities, and the responsibility to ensure that CERN acts in accordance with the highest standards of radiation and environmental protection.

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A WORD FROM THE DIRECTOR-GENERAL

SAFETY FIRST!

The Safety Policy document drawn up in September 2014 is an excellent basis for the implementation of Safety in all areas of CERN's work. I am happy to commit during my mandate to help meet its objectives, not least by ensuring the Organization makes available the necessary means to achieve its Safety objectives.

One of the main objectives of the HSE (Occupational Health and Safety and Environmental Protection) unit in the coming months is to enhance the measures to minimise CERN's impact on the environment. I believe CERN should become a role model for an environmentally-aware scientific research

laboratory. Risk assessment and prevention and emergency preparedness are also key targets. An effective approach to handling radioactive waste is also important for CERN where we must work to limit the production of such waste, sort it effectively, store it safely and ensure safe disposal.

As an illustration of my commitment to Safety, I have appointed the Head of the HSE unit as a member of the Research Board, the body that sets the laboratory's scientific programme, in order to ensure that Safety considerations are taken into account when project proposals are considered for approval.

CERN has an excellent track record in matters of Safety, but there is always room for improvement, and there is never room for complacency. We all have the duty to comply with the safety rules and to encourage our colleagues to do the same. Safety is a shared responsibility of all of us, not someone else's job. I count on you to help us meet CERN's Safety objectives, just as much as I count on you to help achieve our scientific goals.

Fabiola Gianotti

Safety Tips

- Your **Territorial Safety Officer** (whose name should be on the entrance door to your building) can advise on Safety issues with your building and in your office, as can your **Departmental Safety Officer or LEXGLIMOS**, who is holding the equivalent role of the DSO for the Large experiments. Make sure you know who they are, and don't hesitate to consult them.
- Look for the **emergency evacuation notices** in your building and make sure you know what to do in an emergency.
- The HSE unit is available to advise on all aspects of Safety at CERN. Please contact **HSE experts** early if you are planning a major project.

A NEW TYPE OF COATING TO CHASE THE CLOUDS AWAY

high vacuum (UHV) conditions to avoid any impurities," explains Mauro Taborelli, member of the Surfaces, Chemistry and Coatings (SCC) section of the TE-VSC group.

In parallel, Pedro Costa Pinto, together with the TE-VSC-SCC section coating team, was working on improving the hollow cathode used previously to coat the 16 SPS magnets. The new design foresees a train of short cathode modules instead of a single longer coating device. The shorter modules are assembled on site during insertion, allowing the experts to coat two adjacent SPS dipoles *in situ* each time, without having to remove the vacuum chambers from their position in the tunnel.

An even more complex solution was designed to address the coating of the LHC quadrupole triplets ready for the HL-LHC era. The electron

cloud problem will be of particular concern in these magnets as there will be two beams in the same beam screen, with higher intensity and higher brightness than in the present LHC. While the beam screens at CMS and ATLAS won't pose any problems since they will be completely replaced, those at ALICE and LHCb will not be. Therefore almost 35 metres of the triplets' beam screen need to be treated on site on both sides of ALICE and LHCb, where an aperture only 15 cm long is available to insert a coating device.

For these reasons, the TE-VSC group has developed two additional coating techniques, specifically for the LHC triplets. The first one exploits the magnetic field of the quadrupole itself to spray carbon on the beam screens and enhance the deposition efficiency. Should this not be sufficient, another solution foresees

the integration of permanent magnets in the cathode, in order to be able to coat also the interconnection between the magnets, where there is no magnetic field to leverage.

Currently, the work programme is to progressively coat one sextant of the type-B dipoles and half of the SPS quadrupoles *in situ* during the next extended Year-End Technical Stop (EYETS) and during LS2, in the framework of the LIU (the LHC Injectors Upgrade) project. For the LHC triplets the feasibility study will be concluded at the end of this year, and it may be possible as soon as during LS2 to start the coating process in the triplet regions around LHCb and ALICE.

Stefania Pandolfi

(Continued from page 1)

LATEST NEWS FROM THE YETS: ALL RESTARTING EXCEPT THE LHC

With the closure of the SPS at 3 p.m. on Friday, 19 February, maintenance work is now ongoing only at the LHC. All activities are on track for a smooth restart in a few weeks' time.

At the LHC, all general maintenance activities are proceeding well and according to schedule. In particular, the electrical tests on the general emergency stops have been completed, while the cooling and ventilation maintenance, including leak repairs at various points, will be completed by the end of this week for the whole machine.

By the end of next week, the teams will also have completed the bakeout and commissioning of all the collimators, while

the installation of coaxial cable for clock distribution for CMS TOTEM has been postponed to the Extended Year-End Technical Stop (EYETS), scheduled to start in December.

Following a recent decision, additional electrical tests of the circuits (ELQA and Energy Extraction insulation tests) for the whole machine have been added to the schedule.

The SPS is currently back in the hands of the Operations team and being prepared for its

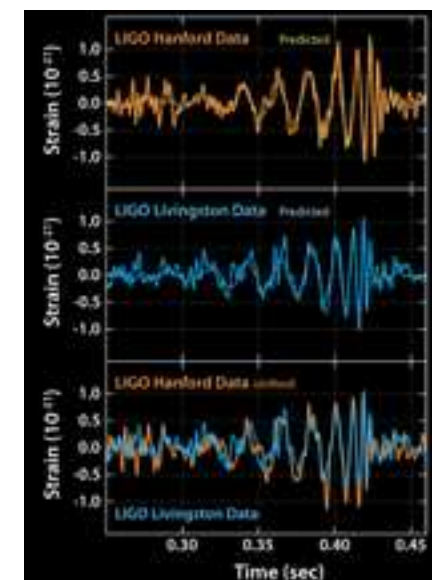
restart. All planned work was completed on schedule, as well as some additional unplanned activities that were still on going this week. The teams have changed 18 magnets (instead of the 16 originally planned) and have carried out an extensive campaign to identify and remove obsolete cables. A total of 633 IMPACT entries were created for this eight-week YETS.

For several weeks now, the PS and the PS Booster have been back in the hands of the Operations teams. Beams are due to return on 8 March.

Antonella Del Rosso

LIGO: THE STRONG BELIEF

Twenty years of designing, building and testing a number of innovative technologies, with the strong belief that the endeavour would lead to a historic breakthrough. The *Bulletin* publishes an abstract of the *Courier's* interview with Barry Barish, one of the founding fathers of LIGO.



The plots show the signals of gravitational waves detected by the twin LIGO observatories at Livingston, Louisiana, and Hanford, Washington. (Image: Caltech/MIT/LIGO Lab)

former Director of the Global Design Effort for the International Linear Collider (ILC) led the LIGO endeavour from 1994 to 2005. On the day of the official announcement to the scientific community and the public, Barish was at CERN to give a historic seminar that captivated the whole audience, which had gathered in a packed Main Auditorium. We had the opportunity to interview him. A longer version of this interview will appear in the April issue of the *CERN Courier*.

Professor Barish, this achievement comes after 20 years of hard work, uncertainties and challenges. This is what research is about, but what was the most challenging thing you had to overcome over this long period?

"It really was to do anything that takes 20 years and still be supported and have the energy to reach completion. LIGO is an incredible technical achievement. The experimental set-up we used to detect the gravitational signal is an enormous extrapolation from anything that was done before. The idea that you can take on high risk in such a scientific endeavour requires a lot of support, diligence and perseverance."

The experimental confirmation of the existence of gravitational waves has a very profound impact on the future of astrophysics and gravitational physics. What do you think are the most important consequences of your discovery?

"The discovery opens two new areas of research for physics. One is on the General Relativity theory itself. Gravitational waves are a powerful way of testing the heart of the theory by investigating the strong-field realm of gravitational physics. Even with just this first event – the merging of two black holes – we have created a true laboratory where you can study all this, and the understanding of general relativity at an absolutely fundamental level is now opening up.

The second huge consequence of the discovery is that we can now look at the Universe with a completely new "telescope". So far, we have used and built all kinds of telescopes: infrared, ultraviolet, radio, optical... And the idea of recent years has been to look at the same things in different bandwidths.

However, no such previous instrument could have seen what we saw with the LIGO interferometers. Nature has been so generous with us that the very first event we have seen is new astrophysics. We have been really lucky. Over the next century, this field will provide a completely new way of doing an incredible amount of new science."

What was your first feeling when you saw the event on your screen?

"We initially thought that it could be some instrumental crazy thing. We had to worry that somebody had done it on purpose. In order to carefully check the origin of the signal, we tracked back the formation of the event data from the two interferometers and we could see that the signal was recorded within 7 msec, exactly the time we expect for

the same event to appear on the second interferometer. The two signals were perfectly consistent and this gave us total trust in our data."

At the seminar at CERN you were welcomed and thanked like a star. It was a great honour for the CERN audience to have you in person giving the talk just after your

colleagues had made the announcement in the US. What are you bringing back from this experience?

"I was very happy to be presenting this important achievement in the temple of science. The thing that made me feel that we made the case well was that people were interested in what we have done and

are doing. In the packed audience, nobody seemed to question our methodology and our analysis. We have one single event but this was good enough to convince me and also my colleagues that it was a true discovery. I enjoyed receiving all the science questions from the audience, it was really a great moment for me."

Antonella Del Rosso

ICTR-PHE 2016: STRENGTH IN NUMBERS

The third biennial ICTR-PHE medical conference (see: <http://cern.ch/go/pW6p>) concluded last Friday, 19 February, once again on a very successful note. More than 400 participants from all over the world met over five days and then returned to their home institutes with new ideas, new collaboration prospects and optimistic visions of the future of cancer therapy.



During the week, the participants had the opportunity to have a look at the 80 posters presented by young researchers. (Image: Salvatore Fiore)

During the five-day conference, a large spectrum of topics was covered – radiobiology, nuclear medicine, detectors and imaging, new technologies... – and a large amount of new research was presented. "I've been impressed by many wonderful lectures, which promise great progress in the future," says Jacques Bernier, Chair of the Department of Radio-Oncology at the Genolier Clinic in Geneva and co-chair of the conference with CERN's Manjit Dosanjh. "It's really important to bring the physics, biology and medicine communities together to work and brainstorm with each other," adds Dosanjh. "This year, I've seen some great examples of this collaboration presented here for the first time."

Some topics sparked a particular interest in the audience, for example the studies on prompt gamma imaging presented by Thomas Bortfeld (Massachusetts General Hospital and Harvard Medical School), Christian Richter (*Helmholtz Zentrum* of Dresden), Saad Aldawood (Ludwig Maximilians University of Munich and King

Saud University of Riyadh) and Brent Huisman (*Université de Lyon*) (creator of one of the six winning ICTR-PHE posters). In particle beam therapy, the finite range of the beam can be a double-edged sword, as any over- or under-shoot of the beam requires extra margins in order to spare healthy tissue. But this can compromise dose distribution and the effectiveness of the therapy. This is why considerable effort is being made to develop imaging techniques for beam range assessment, and prompt gamma imaging appears to be the most promising possibility. Based on the detection of secondary gamma radiation emitted from the nuclear reactions of protons with tissue, it would allow real-time detection of the position of the beam in the patient's body (during treatment) with an accuracy of about 1 mm. With such precision, the range margins could be reduced, resulting in a significant improvement in treatment quality.

Philippe Lambin of the University Medical Centre of Maastricht (Netherlands) tackled

another promising topic, and one we are very familiar with at CERN: big data. In a recent study, he showed how distributed learning can be a solution for rapid learning healthcare. "Rapid learning" is defined as the use of data routinely generated through patient care and clinical research to feed an ever-growing database. Thanks to this database, researchers hope to be able to develop mathematical models – following the example of weather models – capable of "predicting the future".

The presentation on the use of magnetic resonance imaging (MRI) for external beam radiotherapy guidance, by Jan Lagendijk of the University Medical Centre of Utrecht (Netherlands), also opened the audience's eyes to new perspectives. Lagendijk explained that, although for certain tumours it is possible to visualise cancerous structures effectively using cone beam computed tomography linac (CT-linac) radiotherapy systems, this is not the case for all tumours. Online and real-time MRI guidance may allow better imaging and thus improved targeting of these tumours. This could provide a breakthrough in the application of radiotherapy and redefine the relationship between radiotherapy and surgery.

"We look forward to seeing this research translate into real-life clinical applications," concludes Dosanjh. "From the lab to the patient! That's the motto of the ICTR-PHE conference."

For more information and an overview of presentations at ICTR-PHE 2016, visit the ICTR-PHE blog (<http://cern.ch/go/N8TL>).

Anais Schaeffer

OF DATA AND DUST

The traditional image of an archive is one of dusty old boxes, books and papers. When your archive is digital, dust spells disaster. An innovative environmental sensor designed and built by a CERN IT specialist has become an essential element in the Laboratory's data preservation strategy.



The novel air particle monitoring sensor designed by CERN's Julien Leduc.

CERN's archive holds more than 130 petabytes of data from past and present high-energy physics experiments. Some of it is 40 years old, most of it needs to be kept forever, and all of it is held on tape cartridges (over 20,000 of them).

The cartridges are held inside tape libraries with robotic arms that load them into tape drives where they can be read and written. Tape cartridges have many advantages over other data storage media, notably cost and long-term reliability, but topping the list of drawbacks is their vulnerability to

contamination from airborne dust particles; a tiny piece of grit on the rollers, reels or heads can cause scratches or holes in the tape as it is being mounted or wound on the tape drive. With tape media bit sizes being smaller than bacteria or the particles emitted by a car exhaust, any damage to the tape can destroy significant amounts of data.

After a recent minor incident, where the affected tape media were scratched and punctured, finding an air particle monitoring solution became a priority. Commercially available environmental monitoring systems typically cost around 3000 EUR (plus significant maintenance costs) but they're better suited to pharmaceutical labs or semi-clean room manufacturing units, not data centres with high air flows caused by essential air conditioning and internal cooling fans within the computers. So, Julien Leduc from CERN's IT department designed and built a custom environmental sensor. "It's a very simple solution to a very common problem," explains Julien. "Based on a Raspberry Pi computer and Arduino electronics connected to several raw environmental electronic

sensors, the Data Centre Environmental Sensor (DCES) sits in an empty tape drive tray inside the tape library, sampling the air 100 times every 2.5 seconds. It can measure bursts of tiny particles or the presence of larger particles, along with temperature, humidity and air flow."

The first of these devices was installed at CERN's Computing Centre in August 2015 and is already an essential element in the IT department's data preservation strategy. During the DCES development process, Julien developed a portable version that can be loaned to anyone who needs to work inside the Data Centre.

The Data Centre Environmental Sensor is simple, robust, requires no ongoing maintenance and is fully integrated with the other operational monitoring systems in the data centre – when the sensor detects a problem, the alarm is picked up by the technical team, who can then decide how to respond. Better still, the total cost of the equipment is less than 100 EUR.

The open-source design is freely available (<http://cern.ch/go/F9pH>), which is why other data centres are already installing similar systems.

Stephanie Hills

ORGANISING A CONFERENCE? THINK ABOUT WHAT YOU CAN DO FOR START-UPS!

ICTR-PHE 2016 welcomed 16 exhibitors and sponsors as part of its industrial exhibition. If you have ever (co-)organised a large scientific conference, you almost certainly have your own list of major industrial actors that could be interested in becoming exhibitors or sponsors.



The six start-ups present at ICTR-PHE 2016 – Oncoradiomics, Colnec Health, Dixit Solutions, e-Learning4Health, I-See Computing and SmART Scientific Solutions (not pictured). (Image: Salvatore Fiore)

ICTR-PHE has shown that scientific conferences can have a catalysing role in transforming young start-ups and spin-off companies into the key industrial players of tomorrow.

A special start-up corner was provided in the industrial exhibition, where small stands were offered for a modest fee to start-ups and spin-off companies in fields relevant to the conference theme, together with a 5-minute timeslot for a pitch to the audience. Six start-ups, from the Netherlands, Italy and France, took this opportunity to present their products and services, as varied as Monte Carlo simulation for radiobiology, real-time exchange and collaboration in clinical trials, and e-learning for training in radiotherapy. Beyond the extra visibility for the entrepreneurial researchers behind these start-ups, the initiative also added

considerable value for the conference itself: it raised awareness among the participants about the innovative solutions offered by these young companies and effectively demonstrated that being a scientist and an entrepreneur can go hand in hand very well.

"It's very nice to see the scientific community being so supportive towards entrepreneurs," says Frank Verhaegen, Head of Research

in medical physics at the Maastricht clinic in the Netherlands and co-founder of SmART Scientific Solutions, one of the start-ups present at ICTR-PHE 2016. "It's one of those things that makes you wonder: why doesn't every conference do this?"

If you are organising a conference, why not consider having a start-up corner and make a positive impact on entrepreneurs in your

field of research? Don't hesitate to contact the Knowledge Transfer Group (mail-KT@cern.ch) for advice on how to set this up.

David Mazur

THE NEXT GENERATION OF EXPERTS IN TRIGGER AND DATA ACQUISITION GATHER AT ISOTDAQ2016

Fifty-two MSc and PhD students from 21 countries, selected from almost 80 applications, attended ISOTDAQ 2016, the seventh International School of Trigger and Data Acquisition, which was held at the Weizmann Institute of Science in Rehovot, Israel.



Fifty-two students were selected to attend the ISOTDAQ 2016 school.

As in previous years, a packed programme, with as much time devoted to lectures as to hands-on exercises, aimed at giving the students an introduction to the many

concepts and technologies used in the field. A total of 26 lecturers and tutors from CERN, research institutes worldwide and industry came to the school to share their knowledge, not only during the lectures and laboratory exercises but also in numerous face-to-face discussions during the coffee and lunch breaks.

The lectures covered enabling technologies such as FPGAs, A/D converters, networks and bus systems, as well as the design of software, and overviews of selected TDAQ systems from large and small experiments as well as related fields such as medical imaging.

In the lab exercises, the students had the opportunity to operate the hardware

introduced to them in the lectures and to work, under the supervision of an experienced tutor, on small projects. To make the hands-on experience possible, 500 kg of electronics modules and computers, prepared for the 13 exercises, were shipped from CERN to the Weizmann Institute.

During the school, the students also had an opportunity to visit the production facility for a large fraction of the existing AtlasTGC detectors and the future sTGC detectors for the ATLAS Phase 1 upgrade. This gave them an idea of the research activities and the facilities available at the Weizmann Institute's Physics Department.

Markus Joos

THREE NEW STUDENTS SELECTED FOR THE ATLAS PHD GRANT SCHEME

Initiated in 2013, the ATLAS PhD Grant Scheme aims to enable young, talented and motivated students to work on part of their PhD thesis at CERN. The collaboration has just selected the three students who will start their theses in 2016.



The three students who received the ATLAS grant, which will cover part of their PhD studies. From left to right: Ruth Jacobs (Germany), Artem Basalaev (Russia), Nedaa B1 Asbah (Palestine).

The ATLAS PhD Grant Scheme was made possible thanks to a large donation by former ATLAS spokespersons Fabiola Gianotti and Peter Jenni, who started the fund with money from the Fundamental Physics Prize they received in 2013. Applications are handled by CERN HR, via this link: <http://cern.ch/go/f7FN>.

The aim of the initiative is to offer a unique educational opportunity to students within the ATLAS collaboration and to give them the possibility to continue their career in particle physics.

Selected candidates receive a stipend to spend one year at CERN, followed by one year at their home institute. The first three students, selected from 51 applicants from around the world, started their grant periods at the beginning of 2014. In total, nine students have already been selected and have benefitted from the grant.

If you wish to contribute to the initiative, which is one of the CERN&Society Foundation's projects, please visit this page (<http://cern.ch/go/pW6p>). Or read more about this year's ATLAS PhD Grant winners on the ATLAS website: <http://cern.ch/go/c6gp>.

Antonella Del Rosso

Computer Security

ONE CLICK AND BOOM...

Browsing the World Wide Web is not as easy as it seems... One wrong click and all your passwords could be stolen (CERN, Facebook, PayPal, Amazon, etc.); all your activities could be clandestinely monitored (mouse movements and clicks, words typed, screenshots, microphone and webcam recordings, etc.); confidential documents could be stolen; and an attack path (a so-called back-door) into CERN could be opened...

As a result, you would have to reinstall your computer from scratch and change all your passwords! One of our colleagues learned this the hard way. One wrong click in summer 2015 permitted malicious attackers to infiltrate CERN but, fortunately, no real damage was done. Still, the cost of investigating the incident ran to several tens of thousands of Swiss Francs and a lot of time was wasted trying to understand the attacker's intent and the extent of their infiltration...

With the goal of raising more awareness of the risk of clicking on links in unsolicited e-mails, the Computer Security Team ran a "Clicking Campaign" earlier this year, sending fake e-mails to you and your (our) colleagues, intended to lure you into clicking on the embedded link. Once an unfortunate, imprudent victim clicks, they are led to an informative webpage explaining "how to identify malicious e-mails" ([https://cern.ch/](https://cern.ch/security/malicious_email.shtml)

[security/malicious_email.shtml](https://cern.ch/security/malicious_email.shtml); see the picture on the next page). Of course, this click rate is proportional to how sophisticated and well-targeted the e-mail is: the more convincing the look and content of the e-mail, the higher the probability of a click (up to a point where a distinction is only possible by experts). Therefore, in order not to be biased (we can easily design e-mails which you will definitely click), we asked students at the University of Rotterdam to design a series of fake e-mails for us. The boundary condition for them was only to use information that is publicly available from CERN's webpages or from their own imaginations. Still, the results were frightening. Some suggestions were so well-designed that more or less everyone at CERN receiving them would have clicked. Experts would call this a sophisticated and targeted attack, a so-called Advanced Persistent Threat (APT). In the end, we selected five fake e-mail suggestions that we deemed

to be basic, simple and «easily» identifiable as malicious by the recipients...

The click rates, however, told a different story. We got an average click rate of 25%! One in four recipients clicked the link... If those e-mails had been real malicious messages, clicking would have meant: computer infected, all local activities monitored, password stolen, data lost and an attack platform into CERN opened. That one click could have had severe operational and financial consequences for CERN... Thus if you fell for this scam, and my sincerest apologies if you did, let us explain to you how you can better identify such e-mails and what consequences clicking on such a malicious link might have for you and your digital assets in the picture on the next page.

On the positive side, many people identified those fake e-mails for what they were: malicious. We got hundreds of ServiceNow tickets notifying us of "some malicious mails going around". Well done, folks!!! In any case, stay vigilant and take care. Only click once you are sure. If you are in doubt, contact us at Computer.Security@cern.ch.

And keep in mind; we might plan to run a similar campaign during this year with some more sophisticated e-mail messages...

For further information, questions or help, check: <https://security.web.cern.ch> or contact us at Computer.Security@cern.ch.

Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report: <https://security.web.cern.ch/security/reports/en/>

Stefan Lueders, Computer Security Team



LICE-ANNE MARTIN (1926 - 2016)

Alice-Anne Martin, known as "Schu" from her maiden name Schubert, passed away on 8 January 2016.



Hired the year CERN was founded, 1954, when the construction of the Laboratory had not even begun, Schu first worked at the *Villa de Cointrin* (a historic building now within the grounds of Geneva airport) as a secretary. In this role, she typed the convention between

CERN and the Swiss Confederation, prepared by Stéphanie Tixier, as well as some of the "Yellow Reports" that have marked key points in the Laboratory's history. For example, using a special typewriter with 2 keyboards – Latin and Greek – she typed the Yellow Report on the KAM theorem by Rolf Hagedorn.

Schu also worked with Felix Bloch, the first Director-General of CERN, and later became the secretary of Herbert Coblenz, the first CERN librarian. She was head of the team that edited the proceedings of the 1956, 1958 and 1959 international conferences in Geneva.

In addition to a very rich professional life, Schu enjoyed representing CERN in skiing competitions organised by various international organisations, including the UN, ILO, ITU and WHO. Schu won three such competitions and was personally congratulated by CERN's Director-General Cornelis Bakker.

In 1959, she was introduced by Julius Wess, one of the inventors of the theory of supersymmetry, to André Martin, a Parisian physicist, and very soon they were married.

She then became the secretary of Pierre Lapostolle, who was head of the Synchro-Cyclotron division. However, in 1963, when her husband was invited by Robert Oppenheimer to join the Institute for Advanced Study, she had to quit the Organization as, at that time, non-scientific staff were not allowed to take leaves of absence.

Upon returning to Geneva, she decided to devote herself to her children and family life. However, she kept in contact with CERN, in particular through the CERN Women's Club, founded by Jenny Van Hove. Everyone who knew her says she was a wonderful person.

His colleagues and friends

111TH ACCU MEETING

Agenda for the meeting to be held on Tuesday, 8 March 2016 at 9:15 a.m. in room Georges Charpak (Room F, 60-6-015).

1. Chairperson's remarks
2. Adoption of the agenda
3. Minutes of the previous meeting
4. News from the CERN Management
5. Report on services from SMB Department
6. Report on services from IT department
7. The new Microcosm
8. Users' Office News
9. Matters arising
10. Any Other Business
11. Election of ACCU Chairperson
12. Agenda for the next meeting

Anyone wishing to raise any points under "Any Other Business" is invited to send them to the Chairperson (Dragoslav.Lazic@cern.ch) or to the Secretary (ACCU.Secretary@cern.ch).

Michael Hauschild (Secretary)

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

- **Austria** M. Jeitler (manfred.jeitler@cern.ch)
- **Belgium** M. Tytgat (michael.tytgat@cern.ch)
- **Bulgaria** N.N.
- **Czech Republic** S. Nemecek (Stanislav.Nemecek@cern.ch)
- **Denmark** J.B. Hansen (Jorgen.Beck.Hansen@cern.ch)
- **Finland** K. Lassila-Perini (Katri.Lassila-Perini@cern.ch)
- **France** F. Ferri (Federico.Ferri@cern.ch) and A. Rozanov (Alexandre.Rozanov@cern.ch)
- **Germany** K. Rabbertz (Klaus.Rabbertz@cern.ch) and I. Fleck (fleck@hep.physik.uni-siegen.de)
- **Greece** D. Sampsonidis (Dimitrios.Sampsonidis@cern.ch)
- **Hungary** V. Veszprémi (Viktor.Veszpremi@cern.ch)
- **Israel** E. Etzion (Erez.Etzion@cern.ch)
- **Italy** C. Biino (Cristina.Biino@cern.ch) and C. Troncon (Clara.Troncon@cern.ch)
- **Netherlands** G. Bobbink (Gerjan.Bobbink@cern.ch)
- **Norway** K. Røed (Ketil.Roed@cern.ch)
- **Poland** K. Bunkowski (Karol.Bunkowski@cern.ch)
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- **Portugal** F. Barão (Fernando.Barao@cern.ch)
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Official news

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CERN Management is represented by Fabiola Gianotti (Director General), Martin Steinacher (Director for Finance and Human Resources) and Eckhard Elsen (Director for Research and Computing). The Experimental Physics Department is represented by Catherine Decosse and by Doris Chromek-Burckhart (Head of the Users' Office), the Finance and Administration Processes Department by Gregory Cavallo, the Human Resources Department by Ingrid Haug, the Information Technology Department by Mats Möller, the Site Management and Buildings Department by Reinoud Martens, the Occupational Health Safety and Environmental protection Unit by Simon Baird, and the CERN Staff Association by Juan García Pérez.

Secretary: Michael Hauschild (ACCU.Secretary@cern.ch).

<http://cern.ch/ph-dep-ACCU/>

TAXATION IN FRANCE

Information regarding income tax in France. Request for additional information: social security number and personal details.

Some members of the personnel living in France have received a letter from the French tax authorities accompanied by a form, to be returned by 31 March 2016 at the latest, asking them to indicate their social security number and to confirm their personal details.

As employed members of the CERN personnel are members of the Organization's own health insurance scheme and do not participate in the French social security system, we recommend that you tick the box indicating that you do not have a social security number.

We also advise you to specify in writing that, as an employed member of the CERN personnel, you do not participate in the French social security system especially by virtue of the 1970 agreement on social security between France and CERN: "Je ne suis pas soumis(e), en tant que fonctionnaire du CERN, à la sécurité

sociale française en vertu de l'accord de sécurité sociale de 1970 entre la France et le CERN (cf. JO du 04-08-1971)."

N.B.: If your spouse participates in the French social security system, he or she should communicate his or her social security number as requested.

If you have any specific questions, please contact HR at 73903 or your local tax office (*Service des impôts des particuliers - SIP*) directly.

HR Department

CERN HEALTH INSURANCE SCHEME (CHIS) – REIMBURSEMENT OF CONTRACEPTION AND STERILISATION

In line with the practice in many Member States and in other international organisations based in Geneva, the CHIS will, as of 1 March 2016, reimburse upon presentation of a medical prescription:

1. contraceptive medicine (e.g. oral medicine or implant);
2. intrauterine contraceptive devices; and
3. medical sterilisation operations (vasectomy, tubal ligations).

These methods of contraception will be considered as pharmaceutical costs or medical treatments, to which the reimbursement rate according to the general rule and the reimbursement bonus applies. Treatment undertaken, or paid, before March 2016 will not be reimbursed.

For more information, do not hesitate to contact the third-party administrator of the CHIS: UNIQA (Tel.: 72730 / uniqa-assurance@cern.ch).

HR Department

TAXATION IN SWITZERLAND

Memorandum concerning the 2015 internal taxation certificate and the 2015 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 2015

The annual certificate of internal taxation for 2015, issued by the Finance and

Administrative processes Department, will be available on 19 February 2016. 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 this link (<http://cern.ch/go/pW6p>).

In case of difficulty in obtaining your annual certificate, send an e-mail explaining the

problem to service-desk@cern.ch.
II - 2015 income tax declaration forms issued by the Swiss cantonal tax administrations

The 2015 income tax declaration form must be completed in accordance with the general indications available at the following address: <http://admin-eguide.web.cern.ch/en/procedure/income-tax-declaration-switzerland>.

If you have any specific questions, please contact HR at 73903 or 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

Take note

WARNING: SAFETY RISK WITH SOME APPLE AC WALL PLUG ADAPTERS

Dear Mac and iOS Users, Apple has determined that some of its two prong Apple AC wall plug adapters may break and create a risk of electrical shock.

CERN users can now exchange their affected Apple wall plug adapters at the Service Desk. To know if your adapter is affected and for any further information concerning the process to follow to exchange it, please check the following URL: <https://cern.service-now.com/service-portal/view-outage.do?n=OTG0028639>.

CERN IT Department

THE CERN ACCELERATOR SCHOOL

Introduction to accelerator physics

This course will take place in Istanbul, Turkey, from 18 to 30 September 2016. It is now open for registration and further information can be found here: <http://cas.web.cern.ch/cas/Turkey-2016/Turkey-advert.html>.

2016 ASIA-EUROPE-PACIFIC SCHOOL OF HIGH-ENERGY PHYSICS

Dear colleagues,

I would like to draw your attention to the **2016 Asia-Europe-Pacific School of High-Energy Physics**. Details can be found here: <http://2016.aepshep.org/>.

The third Asia-Europe-Pacific School of High-Energy Physics, AEPSHEP2016, to be held near Beijing, China, 12-25 October 2016, is open

for applications (deadline 25 March 2016). AEPSHEP is held every second year, hosted in countries in the Asia-Pacific region. The first two schools in the series were held in Fukuoka, Japan, in 2012 and Puri, India, in 2014.

Applications to attend the school are invited particularly from students from countries in the Asia-Pacific region and from Europe, although applications from other regions will also be considered. The programme of the school will be at a level appropriate for PhD students in experimental particle physics. It is anticipated that students working on phenomenology (if not too far from particle-physics experiment) will also be accepted. The school is open to junior post-docs (typically less than two years after completing their PhD), and also advanced MSc students provided their prior knowledge is comparable with that of the principal target audience so that they can benefit from the courses offered at the School.

Wherever possible participants are expected to obtain funding for the fee as well as their travel from their home countries. However, some sponsorship will be available for a limited number of students from countries with developing programmes in particle physics. Eligible students are therefore encouraged to apply even if they do not expect to obtain funding from their home institute to attend the School.

Nick Ellis
(On behalf of the International
Organising Committee)

HAVE YOU HEARD?... AGAIN IN 2016!

10 March 2016 will be the 19th national day of hearing in France, an information and prevention campaign with "A noisy world..."

what about our ears?" as this year's theme. CERN will be participating in the day's events in order to raise awareness of the effects of noise and its impact on our health.

All types of people... all ages... all the time...

Today we live in increasingly noisy environments: thanks to television, headphones, transport, machines at work, leisure activities, etc. Health specialists confirm that all this regular noise exposure is linked to a rise in the early onset of noise-related conditions (tinnitus, deafness, etc.). This hazard affects people young and old, at work as well as at home. Noise is part of our daily life and yet we hardly notice it anymore!

Our ears... a fragile mechanism...

Our ability to hear rests on a fragile mechanism that is easily damaged, often irreparably. At the centre of the ear are cells (hair cells) that transfer information to our brain. These cells normally deteriorate over time, but do so more quickly under the effect of intense and/or repeated noise... until they no longer work. The cells do not regenerate; the effects are irreversible. There is currently no medical treatment for this ailment. As with any other sense, hearing loss negatively impacts on your social and professional life.

CERN's population, representative of society...

The WHO (World Health Organisation) estimates that 16% of the world's population suffers from hearing problems. In July 2015, CERN's Medical Service carried out a screening programme for hearing difficulties. Out of 68 people tested, 13 had an abnormal audiogram: 19%! Hearing loss affected all age groups: 18-30 year olds as well as the over 40s.

23% of people tested were exposed to high noise levels as part of their work. 43% of people tested confirmed being exposed to noise in their private lives, in particular when

playing or listening to music (some of these also suffered noise exposure at work).

However, about a third of participants thought they were not particularly exposed to noise!

Prevention... simple actions

On a daily basis, in your private life and at work, limiting your exposure to intense and/or repeated noise from a young age would seem to be the best approach... but it's not always easy.

This 'hearing' day, CERN is offering you the opportunity:

- to test your knowledge with a quiz (in the form of place mats in the restaurants and flyers in the cafeterias);
- to test your hearing (audiogram) by going to the CERN infirmary*;
- to test the noise levels in your workplace or at your workstation; for these or more specific activities contact the HSE specialists (HSE-bruit@cern.ch)*;
- to take a training course on noise risk, available in the CERN training catalogue (<http://cta.cern.ch>)*.

Finally, from this day onwards, (even if you "haven't heard") try to take regular daily breaks away from noise.



*Service available all year round.

CERN LIBRARY | HERWIG SCHOPPER AND LUIGI DI LELLA PRESENT "60 YEARS OF CERN EXPERIMENTS AND DISCOVERIES" | 10 MARCH

"60 Years of CERN Experiments and Discoveries" edited by Herwig Schopper and Luigi Di Lella.

Presentation on Thursday, 10 March at 4 p.m. in Room C

The book is a compilation of the most important experimental results achieved during the past 60 years. Not only presented is the impressive scientific progress achieved during the past six decades, but also demonstrated is the special way in which successful international collaboration exists at CERN.

The book has been reviewed in the January-February issue of the CERN Courier: see here.

Thanks to an agreement between CERN and the publisher, the e-book is available online Open Access.

60 Years of CERN Experiments and Discoveries
Edited by Herwig Schopper and Luigi Di Lella
World Scientific, 2015
ISBN: 978981466318

CERN Library

SWISS PREMIÈRE OF THE FILM "DEEP WEB" | 11 MARCH 7 P.M. | CERN MAIN AUDITORIUM

On Friday 11 March, the CineGlobe Film Festival at CERN welcomes the FIFDH (International Film Festival and Forum on Human Rights) to the CERN Main Auditorium to screen the Swiss Première of the film Deep Web.

Starting from the online black market Silk Road, this investigation immerses us in the universe of the Tor network and the Dark Web, the cryptic and anonymous side of the Internet. In this modern version of the Far West, inhabited by bounty hunters, libertarians and political dissidents, everything is paid in bitcoins.

After the screening, filmmaker Miruna Coca-Cozma will moderate a discussion on security and the evolution of the web, with the participation of the director of the DiploFoundation, Jovan Kubalija, and CERN Computer Security Officer Stefan Lueders.

Doors open at 7:00 p.m., film begins at 7:30 p.m.. Entry is free with reservation by email to deepweb.cern@fifdh.org. Anyone interested in volunteering for the screening can contact CineGlobe at info@cineglobe.ch.

<http://www.fifdh.org/site/en/program&film=Deep-Web-224543>

ACADEMIC TRAINING LECTURES | REPRESENTING SCIENTIFIC COMMUNITIES BY DATA VISUALIZATION | 14-15 MARCH

Please note that the next series of Academic Training Lectures will take place from 14 to 15 March 2016 and will be given by Dario Rodighiero (EPFL, Lausanne, Switzerland).

Representing Scientific Communities by Data Visualization (1/2)
Monday 14 March 2016

from 11 a.m. to 12 p.m.
<https://indico.cern.ch/event/465533/>

Representing Scientific Communities by Data Visualization (2/2)

Tuesday 15 March 2016
from 11 a.m. to 12 p.m.
<https://indico.cern.ch/event/465534/>

at CERN, IT Amphitheatre (31-3-004)

Description: These lectures present a research that investigates the representation of communities, and the way to foster their understanding by different audiences. Communities are complex multidimensional entities intrinsically difficult to represent synthetically. The way to represent them is likely to differ depending on the audience considered: governing entities trying to make decision for the future of the community, general public trying to understand the nature of the community and the members of the community themselves. This work considers two types of communities as example: a scientific organization and an arising domain: the EPFL institutional community composed of faculty members and researchers and, at a world wide level, the emerging community of Digital Humanities researchers. For both cases, the research is organised as a process going from graphical research to actual materialization as physical artefacts (posters, maps, etc.), possibly extended using digital devices (augmented reality applications). Through iterative cycles of design and experimentation, the research explores theoretically (representation theory, studies about networks, cartography, etc.) and experimentally (development of methods to assess the relevance of each representation depending on the target audiences) how to create effective community mapping. Its global ambition is to inform a theory of design helping to understand how certain community representations can lead to actual cognitive shifts in the way a community is understood.

Seminars

MONDAY, 7 MARCH 2016

14:00 Workshop Experimental Particle and Astroparticle Seminar Zurich 42-R-407

TUESDAY, 8 MARCH 2016

11:00 LHC Seminar ALICE seminar Main Auditorium

WEDNESDAY, 9 MARCH 2016

14:00 Workshop Experimental Particle and Astroparticle Seminar Zurich 42-R-407

14:30 ISOLDE Seminar Nucleosynthesis of heavy elements in supernovae and neutron star mergers

16:00 CERN Computing Seminar Computational challenges of finding the largest prime IT Amphitheatre

MONDAY, 14 MARCH 2016

10:00 Academic Training Lecture Regular Programme Representing Scientific Communities by Data Visualization (1/2) IT Amphitheatre

14:00 Workshop Experimental Particle and Astroparticle Seminar Zurich 42-R-407

TUESDAY, 15 MARCH 2016

11:00 Academic Training Lecture Regular Programme Representing Scientific Communities by Data Visualization (2/2) IT Amphitheatre

11:00 LHC Seminar ATLAS seminar Main Auditorium

Supplemental

NEWS

FROM THE CERN WEB: THE ART OF SCIENCE, THEORY CORRIDOR, DAMPE AND MORE

This section highlights articles, blog posts and press releases published in the CERN web environment over the past weeks. This way, you won't miss a thing...

«Move over Mr Einstein!» A scientific experiment ignites creativity and dialogue
26 February – CMS Collaboration



The inspiration for the latest art exhibition at the *Cité du Temps* came from a scientific experiment the height of a six-floor building, built to the precision of the thickness of a human hair. “CMS – The Art of Science”, by Michael Hoch, running from 27 February to 10 April 2016, delivers a dynamic dialogue between art and science. A combination of photography, collage and installations, it pays tribute to the thousands of people who constructed the Compact Muon Solenoid (CMS) Experiment at CERN's Large Hadron Collider (LHC) near Geneva.

Continue to read on:
<http://cern.ch/go/6cSd>

In theory: Welcome to the Theory corridor
18 February – by Harriet Jarlett and Sophia Bennett



One of CERN's Theory corridors – along here are the offices of most of CERN's Theory department, including those who were interviewed for this series of articles. (Image: Sophia Bennett/CERN)

There are corridors at CERN lined with wooden doors and rusted metal cabinets, where aged, peeling leaflets for long-ago conferences paper the walls next to comic strips and photos. Known at CERN as ‘the Theory corridor’, this is the home at CERN for some of the world's most brilliant minds.

Behind these heavy wooden doors, theoreticians are using equations, computer modelling and logic to try and understand the underlying laws of our universe. Here, ideas such as supersymmetry are born, often decades before technology and experiments can provide the evidence to back those ideas up.

Continue to read on:
<http://cern.ch/go/jL8P>

DAMPE joins the search for dark matter in space
12 February – CERN Courier



The DAMPE detector (far left) installed in the CERN PS T9 beamline. (Image: DAMPE Collaboration)

On 17 December, the Chinese Academy of Sciences (CAS) successfully launched the DArk Matter Particle Explorer (DAMPE) satellite from the Jiuquan Satellite Launch Center in northwest China, marking the entrance of a new player in the global hunt for dark matter.

Continue to read on:
<http://cern.ch/go/x9B6>

A slice of Cosmic Pi
February - UK News from CERN



Cosmic rays concept. (Image: Rik57Dreamstime)

The best way to learn how a particle physics detector works is to design and build your own. That's exactly what a small group of researchers have been doing in their spare time, and prototypes of their Cosmic Pi detector will be prizes for the runners-up in the CERN Beamline 4 Schools competition.

Continue to read on:
<http://cern.ch/go/qLk6>

OFFICIAL NEWS

SUMMER WORK FOR CHILDREN OF MEMBERS OF THE PERSONNEL

During the period from 13 June to 9 September 2016 inclusive, there will be a limited number of opportunities for summer work at CERN (normally unskilled work of routine nature), which will be made available to children of members of the personnel (i.e. anyone holding an employment or association contract with the Organization).

Candidates must be aged between 18 and 24 inclusive on the first day of the contract, and must have insurance coverage for both illness and accident. The duration of all contracts will be four weeks and the subsistence allowance will be CHF 1500.- for this period.

Candidates should apply via the HR department's electronic recruitment system: <https://jobs.web.cern.ch/job/11758>.

Completed application forms must be returned by 4 April 2016 at the latest. The results of the selection will be available by the end of May 2016.

For further information, please contact:
Virginie.Galvin@cern.ch - Tel.: 72855
Geraldine.Ballet@cern.ch - Tel.: 74151

HR Department

TAKE NOTE

RECLAIMING UNUSED IPV4 ADDRESSES

As many people might know, the number of IPv4 addresses is limited and almost all have been allocated.

Although CERN has been allocated some 340,000 addresses, the way these are allocated across the site is not as efficient as we would like. As we face an increasing demand for IPv4 addresses with the growth in virtual machines, the IT Department's Communication Systems Group will be reorganising address allocation during 2016 to make more efficient use of the IPv4 address ranges that have been allocated to CERN. We aim, wherever possible, to avoid giving out fixed IP addresses, and have all devices connected to the campus network obtain an address dynamically each time they connect.

As a first stage, starting in February, IP addresses that have not been used for more than 9 months will be reclaimed. No information about the devices concerned will be deleted from LANDB, but a new IP address will have to be requested if they are ever reconnected to the network. Among other things, reclaiming these unused IP addresses will enable us to remove unused cable connections in the network starpoints, thus making space for the new cabling and switches we need to introduce campus-wide Wi-Fi services.

The second stage to reclaim IPv4 addresses will take place in the middle of the year when we move to a single range of dynamically allocated addresses for systems connected to the campus network. By replacing the two separate ranges allocated today (one for fixed addresses and one for portable devices), we can significantly reduce the total number of addresses that have to be reserved for campus devices, thus freeing up addresses that can be used for servers in the Computer Centre. More news about this second stage will be provided nearer the time, including information about how people can request a fixed IP address if necessary.

If you have any questions about these changes please contact the Service Desk who will follow up as necessary. Please note that systems connected to the Technical Network are not concerned by either of these changes.

IT Department

UPCOMING OPENING OF CERN'S NEW MOBILITY CENTRE

On 29 February, CERN's brand new Mobility Centre will open in the Globe car park. The Centre has been created to cater to the transport needs of everyone at CERN, to simplify procedures and to centralise all the transport services on offer: the rental of CERN bikes and cars, the CERN car-sharing scheme and SIXT car rental.



From 29 February onwards, the Mobility Centre in the Globe car park will be the place to go for all your duty travel needs:

- rental of CERN cars (with or without the CERN logo),
- SIXT car rental,
- CERN bike rental,
- distribution of cards allowing the use of CERN's self-service bike- and car-sharing schemes.

That same day, the premises currently housing the Car Pool in Building 130 will become the CERN garage, responsible for:

- upkeep and repairs on CERN bikes,
- minor maintenance work on CERN vehicles (e.g. replacing windscreen wipers, bulbs and fuses, refilling windscreen washer fluid, pumping up tyres, etc.),
- arranging and following up the repair and maintenance of CERN vehicles outsourced to external garages.

IMPORTANT: please note that the car and bike rental service located in Building 124 specifically aimed at users in the PH department will permanently close at **12 noon on 26 February**. All personnel from all departments are henceforth invited to go to the Mobility Centre for rental requests of any kind and to the garage in Building 130 for any repairs.

Mobility Centre – from 29 February
Open Monday to Friday from 8 a.m. to 12 noon and from 1 p.m. to 5 p.m.
Tel.: 72228

Garage, Building 130 – from 29 February
Open Monday to Friday from 8 a.m. to 12 noon and from 1 p.m. to 5 p.m.
Tel.: 72042.

For more information on CERN's transport services following the changes on 29 February, see: <http://cern.ch/go/kIC8>. The website outlining the transport options available at CERN will be updated on 29 February.

WHERE STUDENTS TURN INTO TEACHERS: THE 9TH INVERTED CERN SCHOOL OF COMPUTING

Now in its ninth year, CERN's "Inverted School of Computing – iCSC2016" will take place at CERN on 29 February – 2 March 2016 in the IT Auditorium (Room 31/3-004).

Attendance is free and open to everyone, and will be webcast for those who cannot attend in person. The programme consists mainly of individual lectures on single topics, while some lectures are complementary to each other and can be followed as a series.

Registration is not compulsory, but will allow you to obtain a hard copy of the booklet, which includes the lecture slides and notes (while stocks last).

Programme & registration: <https://indico.cern.ch/e/iCSC2016>

iCSC2016

This year's programme, selected from a range of CSC2015 student proposals, focuses on challenging and innovative topics, including:

- Template Metaprogramming for Parallel Computing
- Detector Simulation for the LHC and beyond
- Event reconstruction in Modern Particle Physics
- Continuous Delivery and Quality Monitoring
- Multivariate Classification
- Formal Verification
- Shared memory and message passing
- Virtualisation Technologies
- Continuous Integration
- Accelerating C++ applications in Medical Physics

This year's lecturers are:

- Kim Albertsson, University of Technology, Lulea
- Anastasios Andronidis, Imperial College

- London
- Valentina Cairo, University of Calabria, Arcavacata
- Thomas Keck, KIT Karlsruhe
- Kamil Krol, CERN, Geneva
- Pedro Mendes Correia, University Of Aveiro
- Aram Santogidis, CERN, Geneva
- Daniel Saunders, University of Bristol
- Joshua Smith, Georg-August Universität Göttingen
- Jiří Vyskocil, Czech Technical University

About the iCSC

The Inverted Schools of Computing (iCSC) are part of an annual series of schools organised by the CERN School of Computing (CSC). The iCSC consists of lectures presented over several days by former CSC students, providing advanced training in specialist topics.

The iCSC lectures are specially chosen to create a unique educational programme. They are written and delivered by selected students from the previous year's CSC, who demonstrated a very high level of expertise in a given area during their participation at the annual Main School. So why not find a way to promote and share this knowledge, and turn the students into teachers?

The CERN Schools of Computing

The two other Schools that make up the annual CSC series are:

- The Thematic School (tCSC2016) in May in Split, Croatia
- The Main School (CSC2016) in August in Mol, Belgium

For further information on the CERN School of Computing, see: <http://cern.ch/csc> or email: computing.school@cern.ch.

Alberto Pace, Director of the CERN School of Computing

LEARNING

TECHNICAL TRAINING: RF SUPERCONDUCTIVITY AND ACCELERATOR CAVITY APPLICATIONS

We are happy to announce a new training course organised by the TE-VSC group in the field of the physics and applications of superconductors. The course provides an overview and update of the theory of radiofrequency and superconductors:

RF Superconductivity and Accelerator Cavity Applications
<https://cern.ch/course/?164VAC19>

One timetable only:

Tuesday, 8 March 2016: from 2 p.m. to 4 p.m.
Wednesday, 9 March 2016: from 9.30 a.m. to 11.30 a.m.
Thursday, 10 March 2016: from 9.30 a.m. to 11.30 a.m.
Monday, 14 March 2016: from 9.30 a.m. to 11.30 a.m.
Tuesday, 15 March 2016: from 9.30 a.m. to 11.30 a.m.
Wednesday, 16 March 2016: from 9.30 a.m. to 11.30 a.m.
Thursday, 17 March 2016: from 9.30 a.m. to 11.30 a.m.

Target audience: Experts in radiofrequency or solid state physics (PhD level).

Pre-requisites: Basic knowledge of quantum physics and superconductivity.

Duration: 14 hours

Price: 0 CHF

The trainer Professor Ruggero Vaglio (University of Napoli Federico II, Naples, Italy), has 25 years of teaching experience in different universities in Italy, both at undergraduate and graduate level. He has a track record of research experience in the field of the physics and applications of superconductors and oxide electronics.

There are still some places available, but due to the limited number of places it is first come first served. We would be grateful if you could please circulate this information to interested groups/participants in your department. We would like to thank Paolo Chiaggiato for having made this training available to other groups/departments.

Technical Training

MAD-X TRAINING COURSE – 2016

MAD-X 2016 is a annual course series at CERN, within the framework of the 2016 Technical Training Programme on the MAD-X tool used around the world for designing, studying and simulating beam physics for particle accelerators. The lecturer is Laurent Deniau from BE-APB, who has led the MAD team since 2011

Two courses are available:

1. Methodical Accelerator Design MAD-X:
(<http://cern.ch/go/6ptj>) Beginners
Session: 1-2 March (half day: mornings)
2. Methodical Accelerator Design MAD-X:
(<http://cern.ch/go/nCS7>) Intermediate
Session: 10-11 March (half day: mornings)

Target audience: Designed for those needing to become familiar with and acquire some practical experience of particle accelerator design with MAD-X.

Pre-requirements: The course requires some prior knowledge of accelerators and beam physics (e.g. optics) as the theory is not detailed.

The series will be composed of 4 half-day lectures, given in English with questions and answers also possible in French. Participation in all lectures is encouraged to allow people to gain maximum benefit from the course.

If you are interested in MAD-X 2016, please discuss with your supervisor. Registration is required, participants must sign up via the links to the training catalogue given above, and limited number of places are available! Attendance will be recorded in personal training records.

*Organisers:
Laurent Deniau/BE-APB
Technical Training/HR-LD*