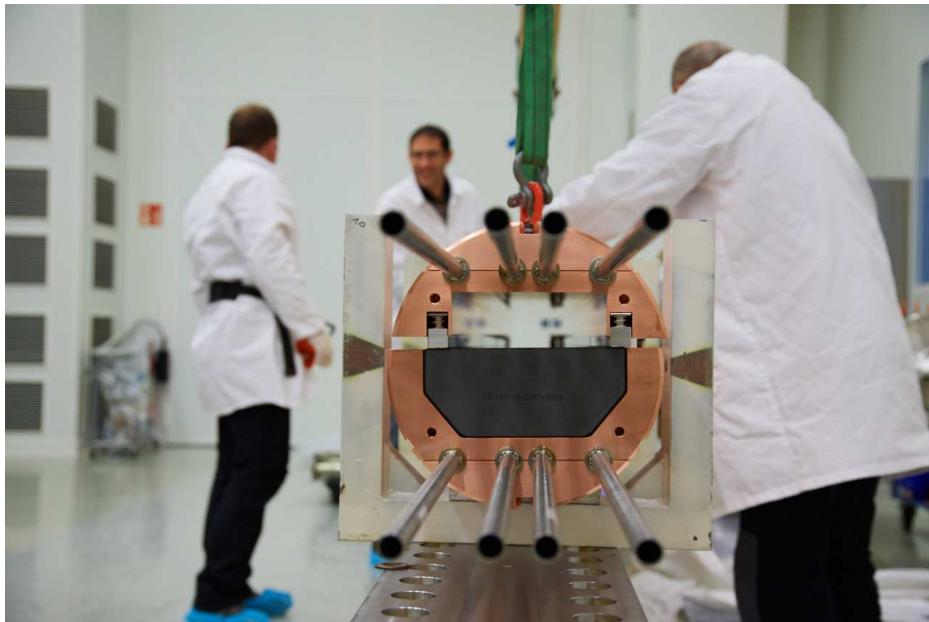


## EYETS REPORT: SO FAR, SO GOOD



*The new internal dump (TIDVG) for the SPS while being assembled. This dump's malfunctioning limited the number of bunches that could be injected from the SPS into the LHC in 2016, so it needed to be replaced. (Image: Maximilien Brice/CERN)*

Since the beginning of December, hundreds of people from CERN's technical teams have been working to repair and upgrade many facilities across the whole accelerator chain and on the experiments. This year's technical stop, referred to as an extended year-end technical stop (EYETS), will be exceptionally long as it will last until the end of April. These additional weeks will allow critical, time-consuming work such as the upgrade of the CMS pixel detector to take place.

Before the EYETS started, ten days were dedicated to powering tests to train the magnets of two LHC sectors. The current was gradually increased in the magnets of both sectors up to 11 535 amperes in sector 4-5, corresponding to an energy of 6.82 TeV.

During the EYETS, three main categories of activities are being carried out: maintenance of many systems (cryogenics, cooling and ventilation, vacuum, electrical systems, etc.); work to prepare the machine and the injectors for the HL-LHC upgrade; and consolidation work and other activities such as the replacement of the 12 lifts along the LHC ring.

The whole LHC has been emptied of liquid helium, to avoid wasting any of the precious gas in the event of unexpected electrical failures during the operations. It also allows the technical teams to perform a lot of maintenance work on the cryogenic system. Since the entire operation of refilling, pumping and boiling off will then take several weeks, the schedule of the EYETS operations – already quite busy – gets really tight. The cryo-filling of the first sector is scheduled to take place between the end of February and the beginning of March.

(Continued on page 2)

## A WORD FROM FRÉDÉRICK BORDRY

### NEWS FROM CHAMONIX

Last week saw the annual LHC performance workshop in Chamonix. These workshops are an essential part of the LHC's annual cycle, an opportunity for the LHC experiments to discuss their priorities with the accelerator community, and for us all to come up with the best plan for the year, optimising the wishes of the experimental community with what can most realistically be achieved with the accelerators over the coming months.

(Continued on page 2)

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# A WORD FROM FRÉDÉRIC BORDRY

## NEWS FROM CHAMONIX

The meeting runs over four days, and is also attended by members of the LHC's Machine Advisory Committee, MAC, a group of accelerator experts from around the world chaired by Norbert Holtkamp of SLAC. This year, some 213 people were registered for the Chamonix workshop, with 44 present for the full four days. Friday was devoted to a closed meeting and a close-out session of the MAC.

This year, we spent the first two days preparing for the 2017 run and planning for Run 2 and Run 3, with attention on Wednesday and Thursday turning to the LHC Injectors Upgrade (LIU) and High Luminosity LHC (HL-LHC) projects. The final session was dedicated to preparing for the LHC's second long shut-

down, LS2, which will entail two years of general maintenance of the injectors and the LHC, the herculean task of LIU installation, HL-LHC underground civil engineering, which cannot be done during LHC operation, and substantial detector upgrades.

The other big question as we go forwards is, of course, the beam energy. At the end of the 2016 run, we had a dedicated campaign to re-train the dipoles in sectors 3-4 and 4-5. Progress was encouraging: over a period of ten days, we reached a magnetic field equivalent to a beam energy of 6.75 TeV. A considerable amount of data was collected over those ten days, and we are now in the process of analysing those data in order to define our strategy how and when to

reach the full design energy of 7 TeV per beam.

As we move towards LS2, which will begin at the end of 2018, attention is turning towards interleaving ordinary machine development with machine development for the LIU and HL-LHC projects, and much progress was made on this front also in Chamonix. For anyone wishing to know more, the presentations are available on Indico, and I'll be giving a brief summary of the workshop in the Main Auditorium at 14:00 on 1 March. I hope to see many of you there.

*Frédéric Bordry*

*Director for Accelerators and Technology*

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## EYETS REPORT: SO FAR, SO GOOD

Another major activity is the replacement of a magnet in sector 1-2. During the Christmas break, the sector was warmed up and several electric quality tests and helium-insulation-tightness tests at ambient temperature were successfully performed, revealing no major issues. One of the major risks of warming up a sector is the deformation of the bellows that hold together the different parts of the cryogenic distribution line. X-rays have been performed on all 250 bellows, revealing no deformation. The ball test has also been carried out and no faults were found on the plug-in modules of the sector.

As regards the injectors, the main activities are on the Proton Synchrotron Booster and Super Proton Synchrotron (SPS). The critical activities for the Booster are re-

lated to the de-cabling and cabling campaign – the identification and removal of all unnecessary cables to make room for the new cables needed for the LHC Injector Upgrade (LIU) project. Moreover, all the infrastructure needed for the HL-LHC in the Booster's surface areas are being installed also as part of the LIU project.

For the SPS, aside from the de-cabling and cabling campaign, the main activities concern the installation of the cryogenics module and related infrastructure for the HL-LHC superconducting crab cavities, and work to replace an internal dump (TIDVG). This dump's malfunctioning limited the number of bunches that could be injected from the SPS into the LHC last year, so it needed to be replaced.

The EYETS schedule is quite tight but everything is proceeding well for now, without any major disruptions. So far, so good!



*The new dipole magnet ready to be installed in sector 1-2. The magnet was finally replaced on Monday, 16 January. (Image: CERN)*

*Stefania Pandolfi*

# CERN & SOCIETY FOUNDATION IN GHANA



Librarians, IT specialists, CERN staff members and staff of the Prempeh II Library gather for the CERN digital library workshop. (Image: CERN)

In December 2016, CERN staff members went to Kumasi, Ghana, to introduce the Invenio digital library software developed at CERN to librarians and IT specialists. Thirty participants from eight different African countries gathered for the week-long training course.

A follow-up week offering about six participants of the Kumasi school advanced training on digital libraries will also take place at CERN during spring 2017. The purpose of the school is to deepen participants' understanding of digital libraries, expose new trends in scientific publishing and emphasise a set of principles related to open access to both data and publications, which is crucial to promoting open science.

This is not the first time the CERN & Society Foundation has partnered on projects in Ghana. In 2012, CERN donated 220 decommissioned servers and 30 routers to the Kwame Nkrumah University of Science and Technology (KNUST). These servers are now being used at the National Institute of Mathematical Sciences, NIMS, hosted at KNUST, a facility partly financed by the Norwegian Academy of Science and Letters.

CERN's Data Centre contains around 10 000 computers that need to be upgraded every four to five years. Once decommissioned, these computers, although obsolete for CERN's cutting-edge research purposes, are still suitable for less demanding applications and can be donated to other institutes.

The CERN-UNESCO School for Digital Libraries is a CERN & Society project and the 2016 school in Ghana was made possible thanks to a generous donation made by Ms Margarita Louis-Dreyfus.

To learn more about the CERN & Society Foundation's activities and how you can be involved, visit the dedicated page (<https://giving.web.cern.ch/content/cern-society-foundation>).

*CERN Society*

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## COMPUTER SECURITY: IOTS: THE TREASURE TROVE OF CERN

IoT at CERN? That's the Internet-of-Things (IoT) here at CERN, e.g. any random device, not necessarily PCs, laptops, tablets or smartphones, connected to CERN's General Purpose Network (GPN) – the GPN-of-Things! And why a treasure trove? The Internet-of-Things is known to be unsecure, unprotected and full of vulnerabilities (see for example "Our life in symbiosis", "Your car, my control", or "Hacking Control Systems, Switching Lights Off!"). The same goes for the devices connected to the GPN: unsecure and unprotected, a playground for hackers and attackers!

At the end of 2016, we performed an in-depth security scan of the CERN GPN\*. Unlike before, when the targets had been laptops, PCs, tablets and smartphones, this time we aimed our scan at the "unusual" devices: embedded controllers, web cameras, control systems and any other box with an Ethernet connection. We found an abundance: voltmeters, television screens, oscilloscopes, programmable logic con-

trollers (PLCs), Ethernet-to-whatever converters and power supplies. In addition to this were many private printers, network switches, wireless access points and VoIP phones, despite the fact that the CERN IT department provides central services for networking, telephony and printing (<http://information-technology.web.cern.ch/services>). So far, so interesting. But it got worse: many of these devices were using default passwords ("admin:admin" anyone?). Others were running outdated firmware versions allowing attackers to crack the password easily or even bypass the authentication step completely. . .

So, if you own an embedded device and if you care that this device is functioning properly, make sure that its security posture is up-to-date: replace any default passwords with your own dedicated passwords. Follow the CERN password rules for this (<https://cern.ch/security/recommendations/en/passwords.shtml>). Also, make sure that the firmware is the most recent version. Some of the devices found

by us flagged that their current firmware was outdated and that a more recent version was ready for download! If a device is essential for your experiment or one of CERN's accelerators, refrain from connecting it to the GPN. Instead, check with your experiment or the [technet-admin@cern.ch](mailto:technet-admin@cern.ch) whether your device is a good candidate to be connected there (or to find out about other alternatives) . . .

*\*No, the CERN Computing Rules do not allow you to run such scans yourself. Thus, please refrain from doing so.*

*Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report ([https://cern.ch/security/reports/en/monthly\\_reports.shtml](https://cern.ch/security/reports/en/monthly_reports.shtml)). For further information, questions or help, check our website (<https://cern.ch/Computer.Security>) or contact us at [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch).*

*Stefan Lueders and Computer Security Team*

# Announcements

## FIFTH THEMATIC CERN SCHOOL OF COMPUTING

The Fifth Thematic School of Computing (**tCSC 2017**) takes place this year in **Split, Croatia, from 4-10 June 2017**. The theme is "Efficient Parallel Processing of Future Scientific Data", looking at:

- Future scientific data processing: challenges in HEP and other sciences, commonalities and differences.
- The prime role of software in modern big science.
- Parallelism and asynchronism: computation and I/O.
- Evolution of hardware and platforms, consequences on data analysis procedures and tools.

The School is open to postgraduate students and research workers with a few

years' experience in elementary particle physics, computing, engineering or related fields. All applicants are welcome, including former and future CSC participants in the main summer school.

**Registration will close on 5 March**, and participation is limited to 24 students. To register, please go to: <https://indico.cern.ch/e/tCSC-2017>.

### About:

The Thematic Schools are part of the annual series of CERN Schools of Computing, to promote advanced learning and knowledge exchange in scientific computing among young scientists and engineers involved in particle physics or other sciences.

They are shorter and more focused than the main Summer CERN School of Computing, but still maintain the same guiding principles: Academic dimension on advanced topics; theory and practice; networking and socialization.

**Applications will be accepted until Sunday 5 March 2017.**

*For more information on the CSC, see: <http://cern.ch/csc>.*

*For registration and more information on the tCSC2017, see: <https://indico.cern.ch/e/tCSC-2017>.*

*Sebastian Lopienski, CSC Director*

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## 4 - 5 FEBRUARY: ELECTRICAL POWER CUTS | MEYRIN SITE

The annual tests of the 18 kV commutation system (autotransfert) require electrical power cuts on the normal and machine network of the Meyrin site on Saturday 4 and Sunday 5 February 2017 from 6:00 a.m. to 10:00 p.m.

Frequent power cuts will occur on the Meyrin site. The EN-EL group recom-

mends that you turn off all your critical equipment and computer equipment.

For any further information, please refer to the "note de coupure ([https://edms.cern.ch/ui/file/1749895/1/ENNC\\_EL\\_2017\\_025\\_AUTOTRANSFERT\\_MEYRIN.pdf](https://edms.cern.ch/ui/file/1749895/1/ENNC_EL_2017_025_AUTOTRANSFERT_MEYRIN.pdf))" and this map of the Meyrin site (<https://edms.cern.ch/ui/file/>

[1749895/1/ENNC\\_EL\\_2017\\_025\\_AUTOTRANSFERT\\_MEYRIN\\_PLAN.pdf](https://edms.cern.ch/ui/file/1749895/1/ENNC_EL_2017_025_AUTOTRANSFERT_MEYRIN_PLAN.pdf)) showing buildings affected by these power cuts.

Thank you for your understanding.

*EN-EL group*

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## MEET HIGH SCHOOL STUDENTS IN A VIDEOCONFERENCE

International Masterclasses give high school students the unique chance to be "physicists for one day" and work with original data from LHC experiments.

Students are invited from nearby research institutes and universities. They get an introduction to particle physics and analyse data from ATLAS, CMS, ALICE, and LHCb.

Afterwards they participate in a videoconference with student groups from other countries and with moderators at CERN.

**The organisers are looking for physicists at CERN** who have a passion for outreach and would like to moderate videoconferences with high school students.

- The videoconferences will be held **at CERN from 4-5 p.m.** each day, with up to 5 groups in one video linkup.
- International Masterclasses cover the period **01.03.2017-11.04.2017**.
- Moderators usually pick 3 dates.
- Moderators work in pairs; a **training is provided**.

- More than 200 institutes from 50 countries participate.

Read more about the programme at: <http://www.physicsmasterclasses.org>.

**Please contact [uta.bilow@cern.ch](mailto:uta.bilow@cern.ch) in case you are interested.**

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## NEW IT TOOL FOR MANAGING THE REGISTRATION OF YOUR VEHICLES

As part of improvements being made to security at CERN, vehicle registration plate readers have been installed at the entrances to the Meyrin and Prévessin sites. This has allowed us to implement a new IT tool that will make life easier, particularly for those of us who have several vehicles. The tool is available at this address: [cern.ch/vehicles](http://cern.ch/vehicles).

With this new tool, from a computer or a smartphone, you can:

- select the vehicle or vehicles you wish to use to access the CERN site,
- raise a ticket if you encounter difficulties in registering your vehicles,
- consult a list of frequently asked questions.

If you wish to add or remove vehicles from your list, you must go to the Registration Service in Building 55.

Please note that from February 2017, the car stickers currently required to access the CERN site will no longer be used.

N.B.: The rules of Operational Circular No. 2 concerning the number of vehicles authorised to enter the site simultaneously and parking conditions (maximum five-day limit) continue to apply.

We hope that this new tool will meet your expectations, in particular by allowing you more freedom in the choice of which vehicle you use to enter the CERN site.

*SMB, BE and FAP departments*

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## CERN ACCELERATOR SCHOOL-VACUUM FOR PARTICLE ACCELERATORS

Registration is now open for the CERN Accelerator School's specialised course on "Vacuum for Particle Accelerators", physics course to be held in **Glumslöv, Sweden, 6-16 June 2017**.

This course will mainly be of interest to staff in accelerator laboratories, university departments and companies manufacturing vacuum equipment.

Further information can be found at <https://indico.cern.ch/event/565314/> and <https://cas.web.cern.ch/cas/Lund2017/Lund-advert>.