CERN Bulletin

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More articles at *http://home.cern/cern-people*

THE END OF YETS: AWAKENING FROM HIBERNATION

The Year-End Technical Stop drew to a close on 9 March. Read about the LHC plans the last year of Run 2

The slumbering LHC during YETS, seen here in February 2018 (Image: Maximilien Brice/Julien Ordan/CERN)

CERN's annual Year-End Technical Stop (YETS) has now come to a close. The Laboratory's accelerator complex will soon begin to lumber out of its winter hibernation and resume accelerating and colliding particles.

But while the LHC has not been filled with protons since the YETS began on 4 December 2017, its tunnels and experimental caverns have been packed with people performing maintenance and repairs as well as testing components for future accelerators.

On Friday, 9 March, CERN's Engineering (EN) department handed the accelerator complex back to the Beams (BE) department, who began the hardware commissioning phase of 2018. This commissioning will culminate in the restart of the LHC, planned for early April.

The 2018 accelerator schedule was agreed at the conclusion of the LHC Performance Workshop in Chamonix at the end of January. Frédérick Bordry, Director for Accelerators and Technology, presented the conclusions of the workshop at a summary session for the CERN community (*https://indico.cern.ch/event/705545/*) last week.

(Continued on page 2)

A WORD FROM CHARLOTTE LINDBERG WARAKAULLE

A DIVERSE ORGANISATION IS A STRONG ORGANISATION

International Women's Day is always an important reminder of our responsibility to support and promote diversity, in all its aspects. This is not a task confined to one day or one event, but an ongoing process in which we must all be engaged. So, what are we doing to reach out and to embed respect for diversity in our work?

(Continued on page 2)

In this issue

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A WORD FROM CHARLOTTE LINDBERG WARAKAULLE

A DIVERSE ORGANISATION IS A STRONG ORGANISATION

Role models matter. That is why, in February this year, to celebrate the International Day of Women and Girls in Science, close to 50 female scientists and engineers working at CERN, the University of Geneva or EPFL visited no fewer than 108 classes in the local area to talk about their jobs. They met around 2400 pupils aged between 7 and 18, receiving an enthusiastic reception wherever they went. This helps to change perceptions, which influence study and career choices. Last November, some 32 women working at CERN contributed to Geneva's Expanding Your Horizons event, helping to bring science to over 450 girls aged between 11 and 14 in a free one-day event at the University of Geneva. Expanding Your Horizons is a global network promoting science, technology, engineering and mathematics (STEM) with the aim of sparking interest in STEM activities and careers.

CERN, of course, has a particular interest in reaching out to young women. The fraction of female staff at CERN is stable at around 20%, while the fraction of female users has been steadily increasing over the years, and now stands at 18%. About a quarter of CERN fellows are women, reflecting the fraction that apply. This is why we are particularly enthusiastic to engage with schools.

In September 2015, the United Nations and partners launched the International Gender Champions network, and CERN was among the first to sign up. Last week, the network launched its 2017 Annual Report on the website genderchampions.com, where you can see how the network helps to bring about change.

Being part of the network means being committed to supporting its goal of gender equality and, to this end, our gender champion, Fabiola Gianotti, made several commitments. We promised to ensure that women are systematically represented among CERN personnel welcoming high-level visitors to the Laboratory, and to develop actions to encourage girls to take science and technology subjects at school. We have also undertaken to improve gender diversity in CERN's public image by adjusting the gender balance of photos and graphics used in CERN communications, and ensuring more female speakers at events hosted at the Globe. Starting in 2018, we have also undertaken to host at least one annual event at CERN dealing with an important issue for women's empowerment in science, engineering and technology.

Initiatives like these matter, because even though we're making progress towards gender equality in the workplace, there's still a long way to go. The all-female panel of co-chairs of the WEF annual meeting in Davos this year, of which Fabiola Gianotti was a member, serves to illustrate the point. Although that panel might have been 100% female, attendance at the annual meeting overall was closer to 20% female, and in the upper echelons of business, part of the Davos meeting's core audience, women represent less than 10%. This matters not only for reasons of equality, but also because studies consistently show that a diverse organisation is a strong organisation.

Charlotte Lindberg Warakaulle
Director for International Relations

THE END OF YETS: AWAKENING FROM HIBERNATION

"The goal for 2018 is to provide ATLAS and CMS with an integrated luminosity of 60 $fb^{1}$and LHCb with 2 fb^{1}over the course of 131 days of physics," he explained. In 2017, the LHC delivered 50 $fb^{-1}$of data to the two main experiments over 119 days of physics, despite a vacuum problem encountered during the intensity ramp-up (*http:///cern-people/updates/2017/09/lhc-report-operation-holes*).

In 2018, the operators will push the Achromatic Telescopic Squeezing (ATS) (*http:///cern-people/updates/2017/11/lhc-report-record-luminosity-well-done-lhc*) scheme further. ATS was used successfully during last year's run, making it possible to reduce the size of the beam (beta* parameter) at the collision point. The operators will adjust this parameter over the course of a run, starting with a 30-cm beta* and reducing it to 27 or even 25 cm by the end. In 2017, the beta* was reduced from 40 to 30 cm. The idea is to carry out luminosity levelling in order to prevent excessive luminosity at the beginning of a physics fill, thereby limiting the number of collisions each time two bunches of protons cross. As in 2017, the operators will adjust the overlap and crossing angle of the beams during the run in order to limit the luminosity. The teams have proposed to the experiments to have a maximum of 55 to 60 collisions per bunch crossing.

One week of the proton run will be devoted to de-squeezed beams, particularly for the benefit of the TOTEM experiment. A four-week lead-ion run is scheduled for the end of the year.

Twenty days of machine development are also planned. "Many studies need to be carried out, not only for the sake of short-term operation, but also for the run following Long Shutdown 2 [LS2] and for the High-Luminosity LHC," explained Bordry.

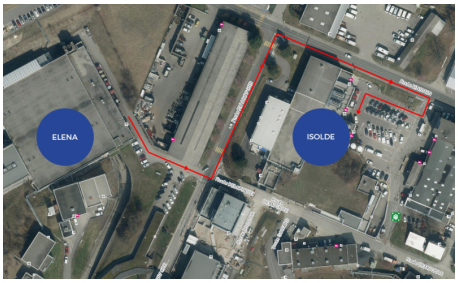
When the lead-ion run is over, tests will be performed on a sector of the LHC for operation at 7 TeV per beam (as opposed to the present energy of 6.5 TeV). “The aim is to prepare the LHC to run with a collision energy of 14 TeV during Run 3,” said Bordry.

This will be the last year of LHC Run 2. “The goal is to exceed 150 fb^{1} during Run 2 alone,” explained Bordry. It is also an important year for all the physics facilities supplied by the accelerator complex, which will not receive beam in 2019 and 2020 during LS2. “We intend to match the record availability of 2017, in order to supply them with as many protons and ions as possible,” he continued. “As well as the physics run itself, 2018 will be crucial for the LIU (LHC Injector Upgrade) project, which will be implemented primarily during LS2, and for the HL-LHC project, construction for which will really start to get going.”

Find out more about what has been happening during the winter shutdown for the LHC (*http:///cern-people/updates/2018/01/works-accelerate-when-lhc-sleeps*), the injectors (*http:///cern-people/updates/2018/01/annual-check-and-upgrades-injectors*) and the experiments (*http:///cern-people/updates/2018/02/whats-yets-experiments*).

THE PUMA PROJECT: ANTIMATTER GOES NOMAD

A new European project linking ELENA and ISOLDE plans to trap antimatter in order to explore quantum phenomena in radioactive nuclei



Antimatter's journey between the ELENA and ISOLDE facilities (Image: CERN)

Antimatter is extremely vulnerable, as it vanishes instantly on contact with matter. However, it has successfully been stored at CERN in the framework of various experiments. Recently, the BASE experiment succeeded in storing a few antiprotons for an exceptionally long period of over a year, with no loss. Now, a new European project aims to achieve a storage time of several weeks for one billion antiprotons, which would allow them to be transported. This would be the first time that antimatter had embarked on an inter-facility journey, which is possible only between two experiments at CERN. But why transport it if it's so fragile?

This original idea is the brainchild of Alexandre Obertelli, a physicist from the Darmstadt technical university (*TU Darmstadt*), who started working on it two years ago. His project, called PUMA (antiProton Unstable Matter Annihilation), aims to explore new quantum phenomena that might emerge from low-energy interactions between antiprotons and slow exotic nuclei. For this to be done, scientists need to trap antimatter and transport it to a facility that delivers radioactive ion beams. This project is thus a bridge between the GBAR experiment at ELENA, which produces antiprotons, and ISOLDE, which will supply the trap with the short-lived nuclei.

A specially designed, double-zoned trap of about 70 cm in length inside a one-tonne superconducting solenoid magnet will ensure that the antimatter cloud doesn't get annihilated during its journey and that it can be stored for a long time. The storage zone will keep a large number of antiprotons at a cryogenic temperature of 4 K. The collision zone of the trap will host the interactions. Both parts of the trap will need to be kept under the extremely high vacuum of 10^{-17} mbar, which is 100 000 times lower than the LHC vacuum. Once ready, the whole structure will travel a couple of hundred metres down Route Einstein to reach its experiment site at ISOLDE.

The project consists of three phases. First, 10^{9} (one billion) antiprotons will be collected at the ELENA facility and stored in the trap. Second, the whole trap structure containing the cooled-down antiprotons will be loaded onto a van and transported to the ISOLDE facility. And finally, once it has reached its destination, the physicists will insert the slow exotic nuclei into the antimatter trap through an ultra-thin window. The extremely quick annihilation process will be closely observed. Moreover, the charge measurements of the emitted pions will make it possible to analyse the ratio of proton-to-neutron annihilations. Antiprotons were used as a probe for matter with stable nuclei at Brookhaven in the 70s and later on at LEAR at CERN. The results of this new experiment should provide evidence of new proton and neutron halos and help understand the development of thick neutron skins in radioactive nuclei, providing valuable information about unexplored quantum phenomena caused by the complex nature of nuclear matter.

“This project might lead to the democratisation of the use of antimatter,” says Alexandre Obertelli. He plans to build and develop the solenoid, trap and detector in the coming two years, with the aim of producing the first collisions at CERN in 2022.

Obertelli was awarded an ERC Consolidator Grant from the European Research Council and the five-year PUMA project was launched in January this year. Along with researchers from RIKEN in Japan and CEA Saclay and IPN Orsay in France, he has submitted a letter of intent to CERN's SPS and PS Experiments Committee (SPSC) to pave the way towards PUMA becoming a CERN-recognised experiment.

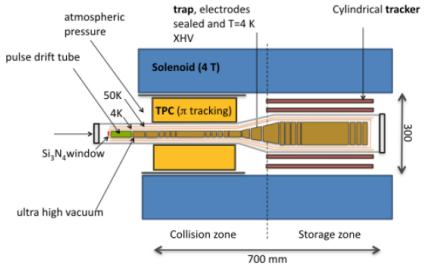


Diagram of the trap to be designed and built (Image: Alexandre Obertelli)

Cristina Agrigoroae

TRAINING PARTICLE AND ACCELERATOR SCIENTISTS OF THE FUTURE

The Joint Universities Accelerator School in Archamps, France, has celebrated its twenty-fifth birthday

Frédérick Bordry, CERN's Director of Accelerators and Technology, during his speech for the celebration of the twenty-fifth anniversary of the JUAS school and the fifth anniversary of its sister school, ESIPAP

More than 100 people attended an event organised by the ESI (European Scientific Institute, Archamps) on 15 February to mark the twenty-fifth anniversary of JUAS (Joint Universities Accelerator School) and the fifth anniversary of its sister school, ESIPAP (European School of Instrumentation in Particle & Astroparticle Physics). Among them were current and former students of both schools, including a sizeable number of staff and fellows, as well as PhD and technical students from CERN who had participated in JUAS or ESIPAP in recent years.

ESI's President, Hans Hoffmann, opened the proceedings with a reminder of the need for international and interdisciplinary collaboration in order to tackle major societal challenges, such as chronic disease and energy transition. "We need to bring all potentially relevant fields of expertise together to think outside the box," he said. "This is how, in all modesty, ESI conceives its thematic schools."

Philippe Lebrun, former Head of Accelerator Technologies at CERN and JUAS Director since 2017, reminded the audience that JUAS exists to teach "the science and technology of accelerators, which are specific domains of physics and engineering in their own right, along with their latest developments, to the designers, builders and operators of tomorrow's machines". Overall, more than 1000 physicists and engineers have been trained at JUAS since it was founded.

These thoughts were echoed by Johann Collot (Grenoble), ESIPAP's Director and a long-standing member of the ATLAS collaboration. Citing the unprecedented international effort under way to reconcile microscopic physics and modern astronomy, he told students they were lucky to be able to focus their imaginations on such a noble task, "which stems from experimentation and whose conclusion will be revealed through experimentation".

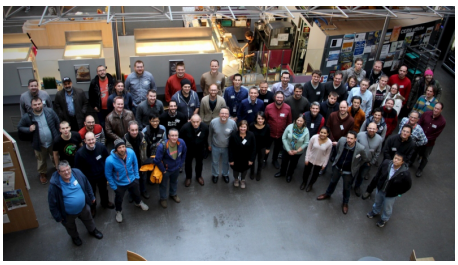
All three speakers concurred that "ESI is one of the rare places in the world where such schools can be organised at an affordable cost."

Particular thanks are due to Frédérick Bordry, CERN's Director of Accelerators and Technology, who was representing CERN's Director-General, Fabiola Gianotti, and whose concluding remarks affirmed the importance of JUAS and ESIPAP in preparing the next generation of particle-accelerator and detector scientists and assured ESI of CERN's ongoing support.

For more information about these schools, see the website of the European Scientific Institute

MANAGING SCIENTIFIC DATA AT THE EXASCALE WITH RUCIO

The first Rucio community workshop, held at CERN, brought together computing experts from several experiments and organisations.



Group photo of the Rucio community workshop

The first Rucio community workshop was held on 1 and 2 March at CERN and brought together computing experts from several experiments and organisations. The focus of the workshop was the collaborative use of Rucio for large-scale scientific data management.

Rucio (*https://rucio.cern.ch/*), an open-source project for managing community data, was developed by the ATLAS collaboration and adopted by the AMS and XENON1T collaborations. Recently, several other upcoming and ongoing experiments have started evaluating it. During the workshop, EISCAT_3D, CMS, LIGO, NA62, IceCube, CTA, COMPASS, SKA, and DUNE presented and described their experience of using Rucio, as well as their requirements for handling petascale or even exascale data sets.

Two keynote speeches were given at the workshop. Dr Tiago Quintino from the European Centre for Medium-Range Weather Forecasts (ECMWF) spoke about "IO and Storage Challenges on the Path to Exascale Numerical Weather Prediction". Dr Karan Bhatia from Google gave a talk on "The Google Cloud Platform and ATLAS – The Data Ocean Project". The Rucio

core team presented the architecture of the system and the plans for the future development of the project. The NorduGrid, Fermilab/FIFE and Open Science Grid teams described their plans to provide Rucio as a service to their user communities. A hands-on technical session with a live demo of the Rucio system and its functionality took place at the end of the workshop.

COMPUTER SECURITY: MALWARE, RANSOMWARE, DOXWARE AND THE LIKE

Your computer and smartphone are the centre of your life and people with malicious intent are seeking to compromise them

Computer security was easy in the last century, when malicious infections usually just involved people misusing a computer to spread or, in the worst cases, delete files. But all that has changed. Today, your computer and smartphone are the centre of your life and people with malicious intent are on the prowl, seeking to compromise them and extort money from you!

The world has changed. Today's attackers are no longer just a few script kiddies hiding away in dark rooms, as Hollywood suggests. “WarGames” is long gone. Instead, they have created illegal enterprises with Mafia-like structures, where management, attacks on end users, computer exploitation, blackmailing and exfiltration of money are separate activities, partially outsourced to “subcontractors” or just bought from third parties:

1. Certain despicable experts create malware that exploits as-yet-unknown vulnerabilities in your favourite operating system or application;

2. Others provide lists of e-mail addresses and deliver that malware as an attachment (e.g. as an infected PDF or Microsoft Office document). Alternatively, they run e-mail campaigns asking the recipient to click on a malicious link (see our *Bulletin* article “Protect Your Click”). The website behind that link has already been compromised by other malicious parties, who have managed to install the malware on it (e.g. as rogue advertisements);

3. The malware is just the vehicle. Top management decides what happens next: “ransomware”, “doxware” or just creating chaos*. If it is about money, the malicious parties provide the infrastructure required to extract it (“pay us $300 in Bitcoins”) and harvest the virtual money;

4. Finally, yet more groups convert the virtual money into real dollars – clean dollars, which cannot be traced back. . .

Attacking the centre of your life has become a serious, but illegal, commercial business. There is a lot of money to be earned and someone will always pay. Don't let it be you!

1. Make sure that all your computers, laptops, smartphones and tablets are up to date. Have your operating system's update mechanism enabled and ensure that it is automatically applying any new security patches. If possible, run some decent antivirus software on it, and remember that CERN's antivirus software for Windows computers and Macs is free to you, even for home use. That should prevent some variants of the malware in step 1 above;

2. In order to thwart step 2, do not click on links or attachments sent to you in unsolicited e-mails. Rather, check the context first: Is the e-mail addressed to you? Is it relevant to you? Does it look legitimate? If in doubt, contact us at Computer.Security@cern.ch. The same is true of browsing web pages. Watch your click. If in doubt, better to Stop – Think – Don't click! Again, if in doubt, contact us;

3. Finally, back up your important data. CERN data should be backed up on AFS, DFS or EOS – services that are designed not to lose data. At home, back up to an external hard disk (but don't keep it permanently connected!) or buy a network-attached storage (NAS) device. If you are blackmailed, it's unfortunate, but do not pay any ransom. This will prevent steps 3 and 4 from happening. The likelihood of getting your data back is very small. If your computer is infected with ransomware, you may be able to recover your files using the tools provided on the following website: https://www.nomoreransom.org/en/index.html (which also contains excellent advice on how to avoid becoming a victim of ransomware).

It's your life. It's your computing device(s). Don't let them get you.

* If you are lost, have a look at this helpful article:

http://www.zdnet.com/article/what-is-malware-everything-you-need-to-know-about-viruses-trojans-and-malicious-software.

Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report (http://cern.ch/security/reports/en/monthly_reports.shtml). For further information, questions or help, visit our website (http://cern.ch/Computer.Security) or contact us at Computer.Security@cern.ch.

The Computer Security Team

Official communications

COMPOSITION OF THE JOINT ADVISORY DISCIPLINARY BOARD (JADB / CPCD)

2018 Exercise

	Appointed by the Director-General	Appointed by the Staff Association
Members	John PYM / DG	Sigrid KNOOPS / TE
1st deputies	Gianluigi ARDUINI / BE	Lynda MEICHTRY/ DGU
2nd deputies	Dante GREGORIO / IPT	Nick ZIOGAS / IPT

Mr Pym and Ms Knoops have drawn up the following list of staff members from among whom the Chairperson of the Board may be chosen when required:

- Ronny BILLEN / BE
- Johan BREMER / TE
- Laure ESTEVENY / IR
- Katy FORAZ / EN
- Malika MEDDAHI / TE
- Kandy MITCHELL / PF
- Alberto PACE / IT
- Stephan PETIT / EN
- Laurent TAVIAN / ATS
- Gabriele THIEDE / FAP

HR Department
HR/DHO

COMPOSITION OF THE JOINT ADVISORY APPEALS BOARD (JAAB / CPCR)

2018 Exercise

	Appointed by the Director-General	Appointed by the Staff Association
Members	Nicole POLIVKA / HSE	Rosario PRINCIPE / TE
1st deputies	Raymond VENESS / BE	Nicolas SALOMON / PF
2nd deputies	Ramon FOLCH / EN	Almudena SOLERO / FAP

Ms Polivka and Mr Principe have drawn up the following list of staff members from among whom the Chairperson of the Board may be chosen when required:

- Sandrine BAUDAT / FAP
- François BRIARD / IR
- François BUTIN / EN
- Etienne CARLIER / TE
- Joel CLOSIER / EP
- Dorothée DURET / FAP
- Alexandra HAHNEL-BORGEAUD / IPT
- Arash KHODABANDEH / IT
- Isabelle LAUGIER / BE
- Pedro MARTEL / BE

Mediators [see Administrative Circular N°6 (Rev. 1) entitled “Review procedure”] will also be selected from this list of ten staff members.

HR Department
HR/DHO

Announcements

BLOOD DONATION | 11 APRIL 2018

Blood donation

Wednesday 11 April 2018 from 8.30 to 15.30

CERN, Restaurant n°2 (Building 504)

After the donation: snack offered by NOVAE and the HUG

www.dondusang.ch

GIVE BLOOD - ONE DAY YOUR LIFE MIGHT DEPEND ON IT

CLOSURE OF MOBILITY CENTRE AND ATELIER MOBILITY

Please note that the Mobility Centre (building 6167, Globe car park) and the Atelier Mobility (building 130, “garage”) will be closed on Tuesday, 3 April 2018 all day for the stocktaking. Thank you for your understanding, *Mobility Centre*

Obituaries

FERDINAND HAHN (1959-2018)

We deeply regret to announce the death of Mr Ferdinand Hahn on 4 March 2018.

Mr Hahn, who was born on 12 July 1959, worked in the EP department and had been at CERN since 18 May 1987.

The Director-General has sent a message of condolence to his family on behalf of the CERN personnel.

Social Affairs service
Human Resources department

Ombud's corner

MICROAGGRESSIONS: RESPOND OR LET IT GO?

Tom's farewell drink had got off to a good start and, after a few glasses, everyone was in high spirits. Carried away by the party atmosphere, Fulvio said to one of his colleagues: "So, Birgit, when are you finally going to update your wardrobe?" Birgit hesitated for a moment, not knowing whether or not she should reply. Not wanting to spoil the mood, she decided to keep quiet and just laughed, a bit embarrassed. As the evening went on, she forgot about it, but when she got back home, the feeling of unease returned. She decided to mention the incident to Fulvio the next time she saw him. The next day, she took him to one side and said calmly: "Fulvio, I know you didn't mean to hurt me, but I want you to know that I found your comment highly inappropriate, and I'd appreciate it if it didn't happen again". Fulvio will probably realise his mistake and apologise. It was important that Birgit talk to him.

Have you, like Birgit, ever been the target of a comment or gesture that seemed innocent but still left you feeling uneasy? You say to yourself: "What if I kick up a fuss over nothing? After all, I mustn't draw attention to myself. There must be something about me that attracts these comments". The problem with microaggressions, as they're called, is that they seem trivial and innocent, but they can be painful when you're on the receiving end. Even if the person responsible didn't mean to hurt you, the very fact that you've sensed a microaggression means that you're justified in reacting to it as quickly as possible. An attitude that you feel to be demeaning can worsen over time if you don't break the vicious circle immediately and decisively.

If you're unsure of the appropriate response, don't agonise over it on your own. Talk to a neutral person whom you trust completely, such as the Ombud.

Pierre Gildemyn

If you'd like to comment on any of my articles or suggest a topic that I could write about, please don't hesitate to e-mail me at Ombuds@cern.ch .