

## ENERGY: MAKING RESEARCH INFRASTRUCTURES PART OF THE SOLUTION

The fourth Energy for Sustainable Science Workshop took place in the end of November at the Extreme Light Infrastructure's Magurele-Bucharest campus



*The Extreme Light Infrastructure's Magurele-Bucharest, Romania campus. (Image: ELI-NP)*

In 2011, CERN, DESY and the European Spallation Source, ESS, teamed up to launch a series of workshops on the topic of Energy for Sustainable Science. The goal was not only to improve energy efficiency at research infrastructures, but also to identify ways of contributing to global energy issues. The idea that research infrastructures should not be part of the problem in terms of energy consumption, but should be part of the solution, has become something of a mantra as the fourth workshop in the series gets underway.

Each workshop is structured around four themes: sharing experience in energy

management, improving energy efficiency, recovering waste energy, and advanced energy technologies. Much has already been achieved since the first workshop in Lund, though this is just the beginning. In Lund, the workshop's ambition was to raise awareness of the issues at stake, and that's something that has definitely been achieved. The number of participants has been growing steadily from workshop to workshop, and participation has now extended beyond Europe.

*(Continued on page 2)*

## A WORD FROM THE DIRECTOR GENERAL

### 25 YEARS OF THE LHC EXPERIMENTAL PROGRAMME

This week, CERN is celebrating the 25th anniversary of the LHC experimental programme with a special scientific symposium looking at the LHC's history, the physics landscape into which the LHC experiments were born, and the challenging path that led to the very successful LHC programme we know today. The symposium will conclude with a presentation of the latest results from the four large experiments.

*(Continued on page 2)*

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**Published by:**

CERN-1211 Geneva 23, Switzerland tel. +41 22 767 35 86

**Printed by:** CERN Printshop

©2017 CERN-ISSN: **Printed version:** 2011-950X

**Electronic Version:** 2077-9518



# A WORD FROM THE DIRECTOR GENERAL

## 25 YEARS OF THE LHC EXPERIMENTAL PROGRAMME

The Evian meeting, “Towards the LHC Experimental Programme”, took place from 5 to 8 March 1992. It was, to quote the *CERN Courier* issue of May that year, the meeting that would “always be remembered as the stage where these ideas made their debut”. For those of us who were there, it’s hard to believe that it’s been 25 years since Evian, yet, at the same time, so much has happened since those early ideas first saw the light of day. It has been a long path, full of challenges, new ideas and innovative technologies. Along the way, a great deal of motivation, determination and patience has been applied, and, in the end, rewarded with excellent performances from the accelerators, detectors and computing, and of course wonderful physics results.

One of us, Fabiola, was there as part of the EAGLE collaboration, which, along with eleven other teams, was presenting an expression of interest (EoI) to carry out research at the LHC. There were four EoIs for general-purpose experiments, three for dedicated B-physics experiments, two for neutrino experiments and two for dedicated heavy-ion experiments. The 12th EoI was for heavy-ion physics at CMS, one of the general-purpose experiments put forward at the meeting.

Evian was a landmark, but it was also part of a process. The idea of the LHC had been formally launched at a work-

shop in Lausanne in 1984. CERN’s Long-Range Planning Committee recommended the LHC in 1987, leading to a meeting on instrumentation in Barcelona in 1989 and a workshop in Aachen in 1990 to study the physics objectives. A Detector Research and Development Committee was also set up in 1990 to stimulate the development of the new technology that would be needed to do physics at a projected collision rate a thousand times higher than anything that had gone before. All this led to the CERN Council agreeing unanimously at its December 1991 meeting that the LHC was the “right machine for the advance of the subject and the future of CERN”. How right they were!

Evian was the natural next step, and then, following the meeting, ideas were refined, collaborations merged, some fell by the wayside, and letters of intent were drafted. The first two of these, for ATLAS and CMS, were both dated October 1992. ATLAS was formed from the merger of two proposals, ASCOT and EAGLE, whereas CMS had evolved from a single proposal presented at Evian. In 1993, the ALICE collaboration’s letter of intent was presented, and LHCb completed the set of large LHC experiments when it presented its letter of intent in 1995.

Unlike Fabiola, the other author of this piece would not be involved in the LHC until much later. At the time of the Evian

meeting, Eckhard had recently moved from the OPAL experiment at CERN to DESY, which was just embarking on an exciting new programme with the HERA electron-proton collider, which would not only do excellent science in its own right, but would also provide invaluable input to LHC analyses. Particle physics is always intricately entwined within and between laboratories in this way.

All this and more will be covered in the “25 years since Evian” symposium on Friday, 15 December.

Do come and join us in the Main Auditorium, or watch the live stream (<https://webcast.web.cern.ch/>) of the event in the Council Chamber, the Filtration Plant or the IT Auditorium or online, from 11.00 a.m.– 4.00 p.m. It will be a wonderful celebration of physics and the great accomplishments of the worldwide high-energy physics community.

Find out more information here (<https://home.cern/cern-people/announcements/2017/11/symposium-mark-25-years-lhc-experimental-programme>).

*This opinion piece has been written by Fabiola Gianotti, Director-General, and Eckhard Elsen, Director for Research and Computing.*

Fabiola Gianotti  
Director-General



# ENERGY: MAKING RESEARCH INFRASTRUCTURES PART OF THE SOLUTION

In Magurele, speakers from China, Japan, the Middle East and the USA are attending, and will be discussing energy needs for their future facilities. There will also be a presentation about the solar energy farm, currently under construction, that will power the new SESAME light source in Jordan, making it the world's first major research infrastructure to be powered entirely by renewable energy.

The workshop series was also designed to raise energy awareness at the European level, a goal that has also been achieved. The EU is well represented in Magurele, with a presentation from Jean-David Malo of the Commission's Directorate General for Research and Innovation, and discussions covering the ARIES accelerator R&D programme, which has energy efficiency built-in as a key area for study in any future project.

Here at CERN, we have been working hard on all four of the workshop themes. As with the other organizing institutions, we have appointed an energy coordinator and established an Energy Management Panel (EMP). The simple act of doing so has served to focus minds on areas for improvement, and the results are already impressive. Some 90% of CERN's energy consumption is linked to the research pro-

gramme, powering our accelerators, detectors and IT facilities, so it is natural that attention should be focused there.

When we recently consolidated the East Area, improving energy efficiency was part of the design brief, with the result that the beam line magnets will now be pulsed so that they are on only when needed. This simple expedient will reduce energy consumption by 90%, a saving of some 600kCHF per year of operation. That may be modest compared to CERN's overall energy bill, but as we continue to introduce such measures, the sums will add up.

Other measures implemented or under consideration by the EMP include an agreement with our main electricity supplier to forecast our energy consumption for the year ahead. By matching our forecast, we help our supplier to plan ahead, and in return we receive a discount. We have developed an energy economy cycle for the SPS that kicks-in when beam is not available from the upstream accelerators. The major experiments are also implementing low energy modes of operation for periods of operational stops.

All of this contributes to making research infrastructures part of the solution, but we

want to go further, by applying our technologies to energy needs. To this end, we have been working with local communities on ways to use our waste heat, and are in the process of installing systems that will use waste heat from the LHC to contribute to the heating of a new neighbourhood.

When we were building the LHC, the eyes of the energy supply industry were on us. Never before had here been such a large superconducting installation, or one that required such metronomic reliability. We have risen to that challenge, and eyes are still on us, because we're now working with one of the most promising conventional superconductors, Magnesium Diboride. It's early days yet, but this material could prove interesting for a new generation of high-field magnets, and might also offer a route to superconducting, loss-free, electricity distribution.

CERN has the ambition to become a reference for environmentally responsible research, and managing our energy is a vital ingredient. The Energy for Sustainable Science workshops are a driving force in making this vision a reality.

James Gillies



## LHC REPORT: AN EVENTFUL AND SUCCESSFUL 2017

Now that the successful 2017 run has ended, let's take a look back at a year full of events



*The CERN Control Centre in 2017. The accelerator complex and the LHC produced a record amount of data in 2017. (Image: Julien Ordan/CERN)*

The last LHC proton beam for 2017 was dumped on 4 December, at around 4 a.m. The machine was switched off and the helium inventory was secured at the sur-

face. Soon, instead of protons, people will be running around the LHC, performing maintenance and upgrade activities, before physics restarts in the spring of 2018.

December is a good time to look back at a year full of events, challenges and successes.

On 29 April, the first beam was injected, following an extended year-end technical stop (EYETS). The machine was then commissioned with a new optics system using an Achromatic Telescopic Squeezing (ATS) scheme to allow for smaller beam sizes ( $\beta^*$ ) in the experiments.

Less than a month later, on 23 May, although with only a few bunches, the first stable beams were declared, and the experiments were able to start recording data. A short period of what is known as interleaved commissioning and intensity ramp-up started, during which a one-week scrubbing run also took place to reduce the emission of electrons from the beam pipe. This is important because it diminishes the electron clouds in the vacuum chamber, which can destabilise the beam. Stable beams with 2556 bunches were declared on 29 July and, soon after that, on 29 August, a new peak luminosity record was established –  $1.74 \times 10^{34} \text{ cm}^{-2} \text{s}^{-1}$ , which

is nearly 75% beyond the design luminosity.

During the ramp-up to this peak luminosity, the first signs of an issue in cell 16L2 arose when beam losses were observed. On 10 August, trying to solve the 16L2 issue, the beam screen was warmed up to evaporate potentially frozen oxygen and nitrogen and to condensate it on the cold bore. Unfortunately, while this method had been used successfully in the past and in other places in the machine, this time it did not produce the desired result, and the 2555 bunches could not be kept in the LHC.

A short period of reduced beam performance commenced. This was an opportunity for the injectors to show their immense flexibility in producing different beam patterns by constructing the 8b4e (eight bunches and four empty slots) beam. This paved the way for the number of

bunches in the LHC to be increased again, as electron cloud production, thought to contribute to the beam dumps as a result of the 16L2 issue, was reduced. The standard 8b4e beam was used by the LHC on 4 September, but development of the beam scheme continued in the injectors and, on 2 October, a brighter version of this beam was delivered to the LHC. In the meantime, the LHC had also started to exploit the ATS optics and the beta\* was reduced from 40 cm to 30 cm, increasing the luminosity for the experiments.

As early as 30 October, the goal for 2017 was reached as the  $45 \text{ fb}^{-1}$  mark was passed. On 2 November, stable beams were declared with a peak luminosity of  $2.05 \times 10^{34} \text{ cm}^{-2} \text{s}^{-1}$ , more than double the design luminosity. By the time the main proton run came to an end on 11 November, more than  $50 \text{ fb}^{-1}$  had been delivered to each of ATLAS and CMS. A special physics run and an intense machine

development programme then took place, finishing on the morning of 4 December, which concluded the successful 2017 LHC run.

Although the Operations group is often in the spotlight when it comes to running the accelerator complex, this year's results were obtained thanks to the effort of a much larger team of people. This team consists of members of many groups in the different departments. A big thanks to all these people for all their work, support, ideas and dedication.

We can therefore all look back on a busy but successful year. We can also look forward to a short break over the holidays before restarting the accelerator complex again in the spring with renewed energy.

*Rende Steerenberg for the Operations group*



## A 350-METRE-TALL TOWER TO PURIFY ARGON

**CERN is participating in ARIA, a project to build a 350-metre column to produce extra-pure argon to be used in a dark-matter search experiment**



On Friday, 24 November, ARIA's top and bottom modules plus one standard module were brought to Building 180 and lined up to precisely test their alignment and interconnections. (Image: Max Brice/CERN)

CERN is taking part in testing phase project, called ARIA, for the construction of a 350-metre-tall distillation tower that will be used to purify liquid argon (LAr) for scientific and, in a second phase, medical and possibly other uses.

The full tower, composed of 28 identical modules plus a top (condenser) and a bottom (re-boiler) special module, will be installed in a disused shaft of a coal mine in Sardinia, Italy. The project was initiated to supply the purest argon possible

to the international dark matter experiment DarkSide at INFN's Gran Sasso National Laboratories.

DarkSide is a dual-phase liquid-argon time-projection chamber that aims to detect the possible passage of a dark matter particle in the form of a Weakly Interacting Massive Particle (WIMP) when it hits the argon nuclei contained in the detector. Since this WIMP-nuclei interaction is predicted to be extremely rare, the detector must contain only the purest argon possible, so as not to accidentally produce a spurious signal.

ARIA has been designed to produce this extra-pure argon. Atmospheric argon contains many "impurities" such as water, oxygen, krypton and argon-39, an isotope of argon, which are all sources of unwanted signals. Argon from underground sources is already depleted from the argon-39 isotope by a factor of 1400, but this is still not enough for dark-matter research. ARIA is designed to purify underground argon from argon-39 by a further factor of 10 per pass, leaving only the radio-stable argon-40 isotope, by harnessing a very simple phys-

ical principle: the two isotopes have different volatility, which means that argon-39 will vaporise faster than argon-40 because it has one less nucleon in its nucleus.

The separation is done via a standard distillation process. First, the Argon is injected at roughly two thirds of the column in gaseous state. The gas reaches the top of the column where it is condensed. The liquid starts flowing to the bottom of the column where it enters the reboiler and is transformed again into gas. At the bottom, a small fraction of an argon-40-enriched flow is extracted as product of the distillation, while at the top a small fraction of argon-39-enriched flow is removed.

Although the process is much like standard distillation, there are certain differences. One of them is the spectacular size of the column – with its 350 metres, it is unique in the world. Furthermore, in order to enhance the isotope separation power, ARIA is filled with a special packing that makes the column equivalent to a series of about 3000 single stage distillation processes. Also, less than 1 part per thousand

of the total flow in the column is extracted as product, which means that the column is working very close to its total reflux condition.

The size of the column and its working conditions are real technological challenges and the realization of the column requires several quality checks performed on each module before and during the installation.

After construction, the modules were brought to CERN, where, one by one, they were leak tested by the Vacuum, Surfaces and Coatings (VSC) group of the Technology Department. On Friday, 24 November, the top and bottom modules plus one standard module were brought to Building 180 and lined up to precisely

check their alignment, geometry and interconnection interfaces, prior to welding. After this, the three modules will be taken to Sardinia, where they will be assembled vertically, initially above ground, to start operating and to test their functionality before assembling the complete column in the mine shaft.

ARIA is expected to be fully assembled by the end of 2018 and to start operations in 2019. Once the technique is proven, many other air components, such as oxygen-18, nitrogen-15 and carbon-13, could be distilled by applying the same process. These elements have important applications in many fields of research and technology, including diagnostic techniques for the detection of cancer.



*ARIA's modules (visible in the background of this photo) are being leak-tested at CERN before travelling to Sardinia. On Friday, 24 November, the top module (in the foreground), the bottom module and one standard column module were lined up horizontally to precisely test their alignment. (Image: Julien Ordan/CERN)*

Stefania Pandolfi



## OPINION: SO YOU WANT TO COMMUNICATE SCIENCE?

**Sijbrand de Jong explains why even the busiest physicists can find time to help inspire and educate the next generation**

I returned to the Netherlands as a professor of experimental physics at Radboud University Nijmegen in 1998. After having enjoyed more than 10 years almost exclusively doing research work at CERN and elsewhere, I found (as I had strongly suspected) that I very much enjoyed teaching. Teaching first-year undergraduate physics courses, I came into contact with high-school teachers who were assisting students with the transition between secondary school and university. While successful for a broad group of students, many realised during their first year of university that studying physics was rather different from what they had imagined when they were still in school. As a result, there was a significant drop-out rate.

An opportunity to remedy this situation came when I read about a cosmic-ray high-school project in Canada led by experimental particle-physicist Jim Pinfold. Soon thereafter, and independently, a Nijmegen colleague, Charles Timmermans, came to me with a similar proposal for our university, and in 2000 we initiated the Nijmegen Area High School Array. Two years later, together with others, we launched the Dutch national High-School Project on Astrophysics Research with Cosmics (HiSPARC), which involved placing scintillator detectors on the roofs of high schools

to form detector arrays. This is an excellent mixture of real science and educating high-school pupils in research methods. It has been a lot of fun to build the detectors with pupils, to legally walk on school roofs, and to analyse the data that arrive. Of course reality is unruly and it is sometimes hard to keep the objectives in focus: the schools can tend to be rather casual, if not careless, about the proper function of their set-up, whereas for the physics harvest it is essential to have a reliable network.

HiSPARC had an interesting side effect. While working with my group on the DΦexperiment at the Tevatron, focusing on finding the Higgs boson, I was, more or less adiabatically, pulled towards the Pierre Auger Observatory (PAO) the international cosmic-ray observatory in Argentina. The highest-energy particles in the universe are very mysterious: we don't yet know precisely where they come from, although the latest PAO results suggest we're getting close. Extreme cosmic rays reveal clues to origin. Nor do we know how they are accelerated to energies up to 100 million TeV. My involvement as a university scientist in a high-school project has completely redirected my research career, and for the past five years I have spent all of my research time on the PAO.

Prompted by my teacher network, around 10 years ago I organised a joint effort between six nearby high schools concerning a new exam subject introduced by the Dutch ministry – "nature, life and technology", which integrates science, technology, engineering and maths (STEM) subjects. Every Friday afternoon, 350 pupils come to our faculty of science, which itself is an organisational and logistical challenge. The groups are organised during the course of the afternoon depending on the activity: a lecture for all, tutorials, and labs in biology, chemistry, physics, computer science and other subjects. Around 10 different locations in the building (and sometimes outside) are involved, and for every 20 to 25 pupils there is one teacher available. Following this project, in 2011 I initiated a two-year-long pre-university programme for gifted fifth and sixth graders in high school, which also takes place at the university and involves about 20 teachers and 14 university faculty members. The first cohort of pupils arrived in 2013, and one of the first graduates in the programme recently completed an internship at CERN.

Admittedly it is a lot of work. But it has been worth the effort. By thinking about how to teach particle physics to pupils with different backgrounds and experiences, I have gained more insight into the fundamen-

tals of particle physics. Even the sometimes tedious experience of bringing school managements together and getting them to carry out projects outside of their comfort zones has prepared me well for some aspects of my present duty as president of CERN Council. Working with pupils and

teachers has enriched my life, without having to compromise on research or management duties. And if I can combine such things with a research career, there seems little excuse for most scientists not to help educate and inspire the next generation.

*Sijbrand de Jong is the president of the CERN Council*

*This viewpoint was initially published in the CERN Courier magazine.*

*Sijbrand de Jong*



## SHOW DON'T TELL - LHCREATE ASKS WHY

**Participants in the annual LHCreat workshop presented their most recent exciting ideas during a two-day event at IdeaSquare**



*This year, the participants were challenged to answer one of the questions most asked by visitors to CERN "Why we do what we do at CERN?" (Image: Daniel Dobos/CERN)*

Earlier this month, participants in the annual LHCreat workshop presented their most recent exciting ideas during a two-day event, designed to allow them to imagine the most incredible ways to solve our biggest questions.

This year, participants were challenged to answer one of the questions most asked by visitors to CERN: why does CERN do what it does?

There was just one catch – they couldn't answer with words. Instead, the participants were asked to design an interactive exhibit that would appeal to the general public.

As a catalyst for this explosion of imagination, we brought together people from diverse backgrounds at CERN (engineers, physicists, IT specialists, administrators, etc.) alongside design and architecture students from the IPAC design school in Geneva.

Together they had 36 hours to imagine, design and build a prototype of the exhibit to be presented at a public event.

The winning prototype was inspired by the current trend for escape games; the twist is that the people playing are asked to break into CERN to learn more. The game consists of four different cubes around a touch screen and players are asked to solve a series of theoretical, experimental, IT and collaboration issues. Each solution provides a

number, which, when entered in the right sequence on the touch screen, unlocks a prize.

IdeaSquare was bustling with excitement throughout the two days and, after the first few hours spent on the drawing board, this translated into manual work in the mechanical and electronic workshops and requests for materials that included yoga balls, Xbox Kinect sensors and springs.

By the end of the workshop, the participants were ready to present their exhibits in both English and French to the public and a jury.

The presentations proceeded very professionally and, after some deliberation, both the jury and the public unanimously selected the winning project, which will be displayed at the CMS site.

More information on the LHCreat website (<http://lhcreate.web.cern.ch/>).



## CERN HOSTS MAJOR INTERNATIONAL FIRE AND RESCUE MEETING

**Some 20 leading firefighters from 13 countries came to CERN from 15 to 19 November for a meeting of experts on fires involving hazardous materials**



Founded in Paris in 1900, the International Association of Fire and Rescue Services (CTIF\*) has become the world's leading expert forum for firefighters, with some 40 Member Countries around the world and a

similar number of Associate Members, including CERN. The work of the CTIF is built around a dozen specialised commissions focusing on issues ranging from volunteer fire brigades to forest fires. Each commission allows firefighters to share their experience with a view to improving operational techniques.

CERN is a member of the Hazardous Materials Commission, which meets twice a year, most recently in Greece and the UK. CERN was asked to host the second meeting of 2017, due to the Laboratory's unique firefighting environment. Around 20 attendees represented some 13 CTIF members. This allowed CERN to share

its experience and challenges and to learn from external expertise. The programme was divided into three parts, beginning with a series of presentations highlighting case studies from each of the participants. CERN's contribution was a talk outlining the Fire and Rescue Service's plans for dealing with a fire at MEDICIS. These presentations were followed by topical working groups, and the business part of the meeting concluded with a workshop focusing on firefighting in a cryogenic environment, an area in which the CERN Fire and Rescue Service has considerable expertise. The cryogenic workshop included tests of firefighting equipment in extremely cold conditions.

The workshop allowed CERN to learn from its guests, while they learned from CERN. It was a unique opportunity to contribute to the work of a leading global network of firefighters and to reinforce working links with fire services around the world, building valuable partnerships for a safe future at CERN.

\*From the French acronym *Comité technique international de prévention et d'extinction du feu*.

James Gillies



## WHY YOU GOT A NEW PDF READER

### Software of high quality that is well programmed, with best-practice security principles in mind, is harder to exploit

Standard best practice in computer security involves always keeping all your devices up-to-date so that malicious evildoers cannot exploit known vulnerabilities and weaknesses to their advantage. However, the problem is the word "known". Not all vulnerabilities and weaknesses are immediately reported and published. On one hand, there is a generally accepted grace period for those that practice "responsible disclosure": software owners usually have about three months to fix reported vulnerabilities before they are made public. Alongside publication, remediation measures are also documented – and applied through the standard update mechanisms. However, some people, organisations or companies prefer a different approach. Instead of "responsible disclosure", they collect weaknesses and vulnerabilities to allow evil deeds, selling them to the highest bidder (often on the black market), or using them for offensive action like espionage or other cyber-attacks...

So let's look at another standard best practice in computer security: reduction of the attack surface. The fewer software packages that are installed on a device, the "better" they are programmed, or the less "mainstream" they are on the market, the smaller the attack surface. Software which does not exist or is not running on a device does not pose any potential risk.

Software of high quality that is well programmed, with best-practice security principles in mind, is harder to exploit. And software that is not "mainstream" might not be the main target for attackers as it is not prolific enough to create revenue when abused.

Operating systems aside, for standard Windows PCs but also for Mac and Linux computers, some of the applications with the most vulnerabilities reported in 2017 are Microsoft Edge, Apple Safari, Adobe Acrobat and Acrobat Reader, and Oracle Java JDK and JRE. While there are others, those listed have maximum domination of the IT market and are installed on many different devices – most likely including yours. But do you really need them? Or are there similar, less common products that have less chance of being exploited?

For sure there are. And this is the main reason why CERN has chosen "PDF-Xchange" for Windows PCs and "PDF Expert" for Mac systems as its new default readers for PDFs. Together with other security measures (namely CERN's sophisticated SPAM filtering engine), this new default reader will avoid computer infections coming via malicious PDF documents aimed at exploiting the vulnerabilities of the market leader. While we do not necessarily believe that the software has fewer vul-

nerabilities, the chances of them being exploited is just much lower, as most malicious evil-doers will concentrate on mainstream products – the list above – and abuse them for their deeds.

Do you want to do more? Review the software installed on your devices, in particular if it is listed here (<https://www.cvedetails.com/top-50-products.php?year=2017>). Remove applications which you do not need or rarely use in order to reduce your personal attack surface. Think also about replacements. There are many good (i.e. more secure) and sometimes free alternatives to your favourite browser or PDF reader. And of course, for the rest: make sure that they are all up-to-date. "Secunia" provides a good tool for you to check (if you want to install another application to rule them all).

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*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](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](mailto:Computer.Security@cern.ch).*

*The Computer Security Team*



## TWENTY-FIVE YEARS OF SERVICE AT CERN

The staff members having reached 25 years of service at CERN in 2017 were invited by the Director-General to a reception on 24 November



The staff members having reached 25 years of service at CERN in 2017 were invited by the Director-General to a reception in their honour on 24 November 2017. We

thank them for their continued commitment and wish them all the best!

*HR Department*

## Official communications

## CERN HEALTH INSURANCE SCHEME (CHIS) - CONTRIBUTIONS AS OF 1 JANUARY 2018

As the CHIS contribution rates are unchanged for 2018, the CHIS contributions for 2018 will only evolve if there is a change in the relevant Reference Salary (see Chapter XII of the CHIS Rules). For instance, as of 1 January 2018, the lump-sum monthly contributions based on Reference Salary II will be as follows:

### 1. Lump-sum contributions for voluntary members

The monthly contribution for voluntary members (e.g. users and associates) with the normal health insurance will be 1207 CHF per month, whilst for those with the reduced health insurance it will be 603 CHF.

### 2. Lump-sum contributions for post-compulsory members other than CERN pensioners

For post-compulsory members other than CERN pensioners, the monthly contribution will be 1289 CHF in the case of former staff members and former spouses continuing their affiliation, whilst in the case of formerly dependent children continuing theirs it will be 516 CHF.

**Note:** In line with the relevant transitory measures, there are no changes in the lump-sum supplementary contributions owed in respect of the spouse or registered partner of a compulsory or

post-compulsory member who does not have a primary health insurance other than the CHIS, but has income deriving from a professional activity (for the amounts, see Official Communication of 13 December 2016 (<https://home.cern/cern-people/official-communications/2016/12/cern-health-insurance-scheme-chis-monthly-contributions>)). Changes will, however, take place on 1 March 2018; they will be announced in detail in February 2018.

*HR Department  
11.12.2017*



## SERVICE AVAILABILITY DURING CERN ANNUAL CLOSURE 2017/2018

Please note that the Service Desk will be closed during that period, however in case of urgent requests, you can call/contact (+41 22 76) 77777. Calls will be redirected to the relevant support groups.

### General Services

As always, like the emergency and fire service (7 4444), the security service remains operational 7/7, 24h / 24h and reachable via 78878. However, the services provided by the SMB department requiring human presence (such as CERN hotel, the car sharing service, the shuttle service, etc.) will not be operational during the end of the

year closure.

Services that do not depend on a continuous human presence will remain available offering a reduced level of support during this period. In general, the response time to normal problems will be a half day (no guarantee), but in case of serious failure, the reaction time will depend on the ar-

rangements that have been made with the supported services.

Any incidents will be documented on the CERN Service Status Board (<https://cern.service-now.com/service-portal/ssb.do>). For more information, please consult the CERN Services Portal (<https://cern.service-now.com/service-portal/>).

Please also note that the heating of the Meyrin and Prévessin sites will be switched into a low mode. This reduced level will lead to a slight drop in temperature, in order to gain energy savings during this period of low occupancy.

### Computing Services

Most of the services provided by the IT department - including WLCG production services - will remain available during the CERN annual closure. No interruptions are scheduled but in case of failure, the restoration of services cannot be guaranteed.

Problems will be dealt with on a best effort basis only and the availability of spe-

cific services might be limited by the availability of other services.

Please note that:

- All network and telecom services will run as usual, field technicians will act upon failures on the infrastructure, but changes requiring human intervention will not be possible.
- Incidents will be listed on the CERN Service Status Board for Computing (<https://cern.service-now.com/service-portal/ssb.do?area=IT>).
- With the exception of 24 & 25 December and 31 December & 1 January best-effort support can be expected for the following services: activation of accounts, AFS, CASTOR, CDS, CERN Grid Services, CERNBox, Cloud Infrastructure, Configuration Management Service, CVMFS, Dashboard Monitoring Service, Databases, E-mail, EOS, FTS, GitLab, Indico, Inspire, Java web hosting, JIRA, Linux, Ixbatch, Ix-plus, Lync, Network & Telecoms,

Open Data Repository, Oracle web hosting (Apex), Printing, resetting passwords, room booking system, ServiceNow, SVN, TWiki, Vidyo, Web Services, Windows & Windows Terminal Services and Zenodo Repository.

- The backup service will remain operational, but backups cannot be guaranteed and file restores may not be possible.
- For the CASTOR service, damaged tapes will not be processed.

The operator service will be available and can be reached at 75011 or by email to [computer.operations@cern.ch](mailto:computer.operations@cern.ch), where urgent problems may be reported.

Potential computer security incidents must be reported to [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch) or 70500 as usual.

Please remember to shut down and power off any equipment in your office that is not required during the annual closure.



## PENSIONS PAYMENT DATES IN 2018

Monday 8 January

Monday 7 May

Friday 7 September

Wednesday 7 February

Thursday 7 June

Monday 8 October

Wednesday 7 March

Friday 6 July

Wednesday 7 November

Friday 6 April

Tuesday 7 August

Friday 7 December



## OFFICIAL HOLIDAYS IN 2018 AND END-OF-YEAR CLOSURE 2018/2019

**Official holidays in 2018 (in addition to the special leave during the annual closure):**

- Monday, 1 January (New Year)
- Friday, 30 March (Good Friday)
- Monday, 2 April (Easter Monday)
- Tuesday, 1 May (1<sup>st</sup>May)
- Thursday, 10 May (Ascension day)
- Monday, 21 May (Whit Monday)
- Thursday, 6 September ("Jeûne genevois")

- Monday, 24 December (Christmas Eve)
- Tuesday, 25 December (Christmas)
- Monday, 31 December (New Year's Eve)

January 2019 inclusive (without deduction of annual leave).

The first working day in the New Year will be Monday, 7 January 2019.

**Annual closure of the site of the Organization during the Christmas holidays and days of special leave granted by the Director-General:**

The Laboratory will be closed from Saturday, 22 December 2018 to Sunday 6

To add official holidays to your CERN Exchange calendar, follow these instructions (<http://home.cern/cern-people/announcements/2013/04/set-your-calendar-show-cern-official-holidays>). A printable version of the CERN Calendar is available here (<https://printservice>.

Human Resources Department  
Tel. 72894/62959



## EXTENSION OF THE PRE-RETIREMENT PROGRAMMES

Following a recommendation by the Standing Concertation Committee at its meeting on 16 November 2017 and approval by the Director-General, please note that:

- the Progressive Retirement Programme has been extended by one year, from 1 April 2018 until 31 March 2019;

- the Scheme of Part-Time Work as a Pre-retirement Measure has also been extended by one year, from 1 January 2018 until 31 December 2018.

[de/447](https://admin-eguide.web.cern.ch/node/447)  
- part-time work as a pre-retirement measure (<https://admin-eguide.web.cern.ch/node/484>)

Human Resources Department

Further information is available from the following sites:  
- progressive retirement programme (<https://admin-eguide.web.cern.ch/no>



## THE INSURANCES AVAILABLE FOR STAFF MEMBERS AND FELLOWS

We are all aware of UNIQA as third party administrator of our health insurance scheme, but sometimes less so of other types of insurance we may benefit from. Here are two particular insurance types worth considering in your life at CERN:

### 1. Loss of earnings insurance:

Taking out insurance against loss of earnings grants protection against the associated financial consequences. This option is proposed by UNIQA ([https://cds.cern.ch/record/2017215/files/Loss\\_of\\_income\\_CERN\\_Conditions\\_generales\\_en.pdf](https://cds.cern.ch/record/2017215/files/Loss_of_income_CERN_Conditions_generales_en.pdf)) or via the Staff Association (<http://staff-association.web.cern.ch/fr/adhesion>). For reference, the cost of the premium is 0.15% of the annual salary through the Staff association and 0.17% through UNIQA.

The Staff Rules and Regulations (art. R II 4.13) state that when a person accumulates over 12 months of sick leave (other than deriving from an occupational illness or accident) during any period of 36 months, their remuneration paid by CERN is reduced. Remuneration is reduced to two

thirds when the staff member accumulates between 12 and 30 months of absence and reduces to zero after the period of absence exceeds 30 months.

A 12 month delay applies before benefitting from the insurance.

You can find full details, including how to apply on this site (<http://hr-dep.web.cern.ch/chis/loss-earnings-insurance>).

### 1. Life Insurance:

This group insurance, available on a voluntary basis, has been negotiated by CERN with the insurance company Helvetia and offers very competitive conditions for CERN staff members and fellows. The premium, which varies depending on the age and gender of the person insured, is calculated on the basis of the amount of the death benefit chosen by the staff member/fellow (from 10'000 CHF to 1'500'000 CHF) and can be "purchased" in slices of 10'000 CHF.

Once the insurance affiliation is confirmed, all the administration will be handled au-

tomatically by the Salaries Office, and the premium deducted monthly from your salary.

The insurance contract normally ends at the retirement age for staff members (65/67 years), or when the staff member/fellow leaves the Organization.

Upon retirement, under certain conditions the staff member may opt to maintain their membership.

Further details about this Life Insurance can be found on this page (<https://fap-dep.web.cern.ch/acc/helvetia-life-insurance>) or contact the Salaries Office Bureau.Salaires@cern.ch, who will be happy to provide you any additional information you may need.

You can find out more about all optional insurances and benefits on CERN's HR webpages (<http://hr-dep.web.cern.ch/node/1507>).

HR Department



# ACCESS TO THE ORGANIZATION'S SITE DURING THE END-OF-YEAR CLOSURE

The only persons who will be entitled to enter the CERN site during the end-of-year closure are those who are required to perform essential or emergency work.

This year, CERN will be closed from Saturday, 23 December 2017 to Sunday, 7 January 2018 inclusive. The first working day of the new year will be Monday, 8 January 2018.

As is the case every year, the only persons who will be entitled to enter the CERN site during the end-of-year closure are those who have received authorisation to do so for strictly professional reasons such as stand-by service and indispensable maintenance work.

Each department and, in particular, each experiment's technical coordinator, is responsible for compiling a list of the people in receipt of such authorisation by Friday, 22 December 2017 at the latest.

Any members of the personnel of outside companies who are required to work on the CERN site during the closure must also have a valid AET (notice of work done outside normal working hours) and thus must be included in the relevant department's list.

During the period when the Laboratory is closed, i.e. after 22 December, anyone who needs to enter the CERN site for an urgent reason and without the prior authorisation of her/his department or her/his

experiment's technical coordinator will be obliged to submit an access request (select the "XMAS-2017" permission) that will have to be signed by the CERN Control Centre (CCC) or the Security Service. The "XMAS-2017" permission option will not be available in the ADAMS system prior to 23 December.

You are also kindly asked to note that all CERN services (including the restaurants and the library) will be closed during the end-of-year closure.

We thank you for your cooperation and wish you a very happy end-of-year holiday!

*The BE and SMB departments*

## Announcements

### MODIFICATION OF TELECOM LAB OPENING HOURS

As of 1st January 2018, the Telecom Lab will be closed during one hour at lunch time, between 12:30 and 13:30. The new opening hours are:

Monday-Friday: 8:30-12:30 and 13:30-17:30  
<http://cern.ch/gsm/>

*Telecom Lab / IT-CS Group*  
Phone: 77777 (Service Desk)  
labo.telecom@cern.ch  
Location: 600/R-010



### 2018 CERN-JINR EUROPEAN SCHOOL OF HIGH-ENERGY PHYSICS

The 2018 CERN-JINR European School of High-Energy Physics will be held in Maratea, Italy from 20 June to 3 July 2018.

Details can be found here: <http://cern.ch/physicschool/ESHEP/ESHEP2018/>

Please note that the deadline for applications is **16 February 2018**.

The lectures will cover a broad range of HEP topics at a level suitable for students working on their PhD in experimental particle physics.

Note that, as indicated on the web pages, one or two students from developing countries can be considered for financial support.

*Nick Ellis and Martijn Mulders, On behalf of the Organising Committee*



# REMOTE ACCESS TO LIBRARY ELECTRONIC RESOURCES

Publishers and information providers are progressively strengthening authentication on their servers by introducing secure http. And as you have noticed, the current system doesn't work anymore for some resources such as APS Journals.

There is therefore a new authentication procedure to access online resources made available by the Library from outside CERN. As a consequence, from now on, URLs of online resources (=articles, ebooks, databases) made available by the Library must, for remote access, be prefixed by: <https://ezproxy.cern.ch/login?url=>

URLs of resources listed on the CERN Document Server <<https://cds.cern.ch>> or on the Library web site <<http://library.cern>> are currently being modified to make sure the prefix is automatically added.

If you access the online resources listed above directly from a Google search or any other web site, you must add to the url of the resource the prefix: <https://ezproxy.cern.ch/login?url=>

As an example, to access this article: <http://www.sciencedirect.com/science/article/pii/S0168900217310045>

You need to modify the url as follows: <http://ezproxy.cern.ch/login?url=http://www.sciencedirect.com/science/article/pii/S0168900217310045>

To simplify access, we advise you to install a bookmarklet (working on all browsers: Chrome, Safari, Firefox, Internet Explorer - javascript must be enabled). All instructions on how to install this Bookmarklet are available on this page: <<http://library.cern/resources/remote>>

Please note that:

- Inside CERN, the access works as usual.
- This service works for CERN Computer account only.
- The access will only work if the CERN Library has a subscription to the resource. Please check the availability on the CERN document server or on the Library resources webpage
- No authentication is needed for Open Access resources
- The current Proxy system remains active for the time being, but is not maintained anymore.

In case of any problem or to provide feedback, please contact: <[library.desk@cern.ch](mailto:library.desk@cern.ch)>

More information available on the Library website:

<<http://library.cern/resources/remote>>



## ANNUAL CLOSURE OF THE CERN RESTAURANTS

- Restaurant 1 and the newspaper kiosk will close at 4.00 p.m. on Friday, 22 December 2017. The "Grab 'n' Go" kiosk will close the previous day, Thursday, 21 December, at 5.00 p.m. Normal service will resume on Monday, 8 January 2018.

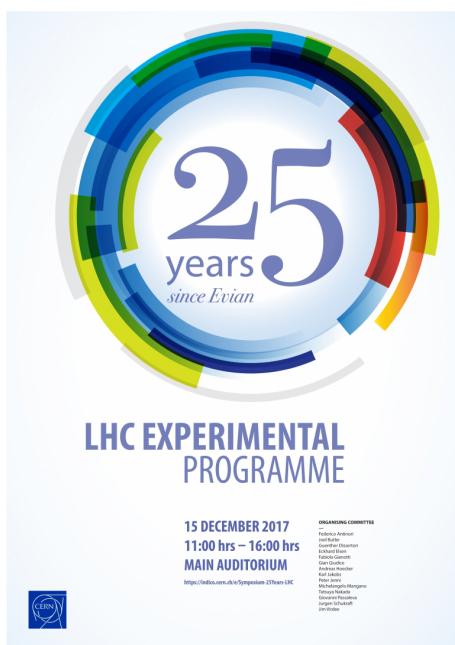
- Restaurant 2 and all the cafeterias on the Meyrin site will close at 4.00 p.m. on Friday, 22 December 2017. Normal service will resume on Monday, 8 January 2018.
- Restaurant 3 will close at 4.00 p.m. on Friday, 22 December 2017. On the same day, the cafeterias in

Buildings 864 and 865 will close at 10.30 a.m. and 10.45 a.m. respectively. Normal service will resume on Monday, 8 January 2018.

• The cafeteria in Building 774 will close at 3.00 p.m. on Friday, 22 December 2017. Normal service will resume on Monday, 8 January 2018.



## SYMPORIUM TO MARK 25 YEARS OF THE LHC EXPERIMENTAL PROGRAMME



**Friday, 15 December 2017 from 11 a.m. to 4 p.m.  
in the Main Auditorium (500-1-001)**

Twenty-five years have passed since the Evian meeting in March 1992, when the LHC experimental programme was launched. The Evian meeting was a crucial milestone in the design and development of the LHC experiments. Detector ideas discussed at Evian evolved into Letters of Intent that were submitted between 1992

and 1995, and which subsequently led to the construction of the LHC experiments.

The symposium will retrace the emergence of the LHC experimental programme against the backdrop of the physics land-

scape of the early 1990s. It will be an occasion to recall some of the ingenuity and a few of the bold decisions that led to the superbly functioning LHC detectors of today.

The symposium will end with a jamboree reviewing recent experimental results from the LHC experiments.

*This symposium is open to the entire CERN community; registration is not required.*

*This event will be live webcast.*

*In the event of the Main Auditorium being over capacity, you will be able to watch the webcast of the symposium in the*

*Council Chamber (503-1-001), in the TH Auditorium (4-3-006) and in the conference room 222-R-001.*

*To see the full programme for the event, visit this Indico page (<https://indico.cern.ch/event/653848/timetable/?print=1&view=standard>) .*



## CHRISTMAS MARKET FROM 12 TO 15 DECEMBER 2017 IN RESTAURANT 1

- Roast chestnuts on Tuesday, 12 December
- Christmas dinner on Thursday, 14 December, with complimentary Yule log
- Free tombola on Thursday, 14 December: smoked salmon, prosecco, panettone, fruit baskets, wine and many more prizes.

Everyone who buys something in Restaurant 1 between 11.30 a.m. and 2 p.m. will receive a ticket. Customers are welcome to attend the draw, which will take place at 3 p.m. on the same day in front of the "Grab 'n' Go" kiosk.



## FIRE AND RESCUE EXERCISE ON 14 DECEMBER

On 14 December from 12:30-16:30, the CERN Fire and Rescue Service will be carrying out a major training exercise in the West Area around buildings 180, 190 and 191.

In preparation for this, the parking spaces near these buildings will be closed from the evening of 13 December.

The exercise will be carried out in conjunction with Geneva's Service d'Incendie et de Secours (SIS), and will involve several fire engines along with three quarters of the CERN Fire Brigade and around 30 fire fighters from the SIS.



## SUBSCRIPTION FOR PAPER VERSION OF THE BULLETIN AND ECHO

CERN's internal magazine is launching its anti-waste campaign. Each year, 50 000 copies of the Bulletin for the CERN community and the Staff Association's Echo are printed, which represents around 300 000 sheets of A3 paper or between 30 and 60 trees.

In an age where everything is digitally accessible no matter where you are, we encourage you to read the Bulletin and the Echo online. Moreover, the online versions are more complete and are updated more regularly. You can sign up for e-mail alerts for the Bulletin and the Echo by visiting:  
<http://cern.ch/go/subscription>

However, if you are unable to access the web, please read the letter accompanying this paper issue of the Bulletin carefully to find out how to continue receiving the Bulletin and the Echo by post.

*The Editorial Content Development section (IR-ECO-CO)  
and the Staff Association*



# CERN SHOP CHRISTMAS SALE



The CERN shop annual sale is now on: CERN card holders can receive 10% off all items in store. Special offer on several items.

*Note that the CERN shop will close at mid-day on Friday 22 December.*



## VIDEO OF THE DISCUSSION WITH CERN'S DIRECTORATE

The video of the discussion with CERN's Directorate which took place on

Wednesday 29 November is available on

this page:

<http://cds.cern.ch/record/2294901>

## Obituaries

### ANDRÉ FROTON (1950 - 2017)

It was with great sadness that we learnt of the death of our colleague and friend, André Froton.

He passed away on the 8th August 2017, taken by a long-term illness he had always stood up to and fought with courage. "Dédé" joined the surveyor's group as a young surveying technician in 1973, at the beginning of the boring for the SPS tunnel, making him part of the 'SPS generation'.

He took part in all stages of all projects the group was heavily involved in, from civil engineering works, to the PS and LEAR, SPS, LEP and the LHC machines, and all the experiments of the PS, SPS, AA, LEP, the LHC, Isolde and HIE-Isolde.

His great knowledge of all the areas of work, and above all the meticulous and practical attention he gave to all his field activities, made André a perceptive and very much trusted co-worker.

André was well-liked by many people from all sectors, at all levels. His kindness and attentiveness touched everyone. He loved to share stories about his cycling tours across the high alpine passes with the *Vélo Club Saint-Julien*, of which he was a member, and about which he was as passionate as he was about his work.

*The members of the Surveying team, past and present*



# Ombud's corner

## HIGHLY SENSITIVE PEOPLE: AN ASSET TO YOUR TEAM.

We're working to increasingly busy schedules, under escalating pressure and with almost constant connectivity due to the increasing number of communication tools and applications available to us. We feel obliged to garner as many "like"s as possible and collect as many "friends" as we can. Most of us have made this permanent availability and service part of our daily lives and have adapted to it very well. But for some 15 to 20% of the population, these constant external stimuli present a real challenge.

Perhaps you know people like this: they can't handle loud environments, they prefer to work alone at their own pace, they fall to pieces when they feel they're being observed, and they are easily overwhelmed. They feel out of their depth, unable to keep up with others and excluded. These may be highly sensitive people (HSP). This is not a flaw, but a character trait, identified recently in the work of the Canadian psychologist Elaine Aron.

HSPs have much to offer as colleagues. Their work is often meticulous, thorough and methodical. Patient and analytical, they excel at spotting subtleties that others don't notice, and they're extremely empathetic.

Highly sensitive people have qualities that make them particularly suited to certain roles. Their heightened emotional awareness means they understand the emotions and motives of others more readily and they are often employed in sales roles, for example, because of their ability to anticipate customers' expectations.

HSPs are valued in managerial roles because they respect and value team members and offer them opportunities. They're clear in their expectations concerning roles and responsibilities. They're not interested in control, but trust people and provide them with the resources they need. HSPs are sensitive to justice and fairness. They're more "relationship-oriented" than "schedule-oriented" and make sure everyone is included in decisions.

HSPs feel at ease in advisory and diplomacy roles and those that involve face-to-face interactions. They also shine in professions that require precision, such as data analysis, accounting and programming.

HSPs make connections and spot things that others don't see, such as tiny variations or omissions. This helps them identify opportunities. Because they're more sensitive than average, HSPs are also useful when it comes to predicting crises. They give off warning signals that, when correctly interpreted, can make it possible to act in time.

If you have people in your team who often seem overworked and easily irritated, ask yourself whether they might be HSPs. Discover your colleagues' inner value and how they can use their assets to the benefit of the team. Consider their difference as an advantage!

*Pierre Gildemyn*