

A NEW POWER TRANSFORMER JOINS CERN'S ARMADA

After a long voyage, CERN's newest and biggest power transformer is ready to reign over the BE2 electrical substation



Baptised "Olive" for the olive-green colour of its tank, the power transformer is 9.7 metres high, 15.8 metres long and 3.9 metres wide (Image: Julien Ordan, Rachel Lavy/CERN)

Early in September, a massive device weighing 224 tonnes and measuring 15 metres in length was loaded onto a barge in Nijmegen, the Netherlands. After navigating the Rhine river all the way to Basel, the whole structure took to the road bound for Geneva in a 66-metre-long convoy. Over the following six days, it moved at 10 km/h on average, mostly travelling at night. The final destination: CERN. On the morning of 4 October at 4.30 a.m., the behemoth arrived.

The spectacular shipment was CERN's newest and biggest power transformer, for the new BE2 electrical substation that is located strategically between the

Laboratory's Meyrin and Préessin sites. The substation has been built to provide redundancy to the existing 66-kilovolt (kV) electrical substation located in Préessin, which is used to supply critical loads, such as those relating to the LHC. The new transformer is so massive that the complex process of unloading it took four full days.

Transformers are typically used to increase the voltage along the transmission path (step-up transformers) or to decrease it (step-down transformers), through electromagnetic induction.

(Continued on page 2)

A WORD FROM ECKHARD ELSÉN

THE EUROPEAN STRATEGY FOR PARTICLE PHYSICS UPDATE IS FORMALLY LAUNCHED

At its September meeting, the CERN Council formally launched the European Strategy for Particle Physics update, approving the establishment and composition of the groups that will steer the process, along with a detailed timeline.

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A WORD FROM ECKHARD ELSSEN

THE EUROPEAN STRATEGY FOR PARTICLE PHYSICS UPDATE IS FORMALLY LAUNCHED

The European Strategy for Particle Physics forms the cornerstone of Europe's decision-making for the long-term future of our field. Initiated in 2006, it was first updated in 2013 to reflect the evolution of the field following the start-up of the LHC. Today, as we approach the LHC's second long shutdown and prepare for the machine's high-luminosity upgrade, it is time to take stock again.

In its first two iterations, the European Strategy put the emphasis firmly on the LHC, with global coordination in other areas of the field also taking prominence. Now, as we have a cornucopia of results from the LHC and other facilities to inform us, coupled with impressive progress from the CLIC and

FCC study groups, as well as from the Physics Beyond Colliders study, there is a wealth of information for the community to digest. Plans and options for experiment programmes outside CERN will also be taken into consideration. All this will feed in to making well-informed choices about the future aspirations for particle physics in Europe as the LHC programme plays out and we start to look at what may lie beyond.

On the initiative of the President of the CERN Council and the Chair of the European Strategy Group, a new feature of the process this year is enhanced communication of the process, both to members of the particle physics community and to those beyond the community who follow our field. In line with the

underlying ethos of the Strategy, this aims to ensure that the process is as inclusive as possible, giving a voice to the grass roots of the particle physics community. By the time the process is complete, and its recommendations presented to the Council in 2020, the future roadmap should be coming into clear focus.

For more information, read CERN's press release on the Strategy update (<http://press.cern/press-releases/2018/10/european-particle-physics-community-gears-new-shared-vision-future>).

*Eckhard Elsen
Director for Research and Computing*

A NEW POWER TRANSFORMER JOINS CERN'S ARMADA

Electricity is transferred from power plants at high voltages and arrives at CERN at 400 kV. This must ultimately be lowered to 66 kV or 18 kV, the levels at which much of the Laboratory's electrical equipment operates, by means of step-down transformers.

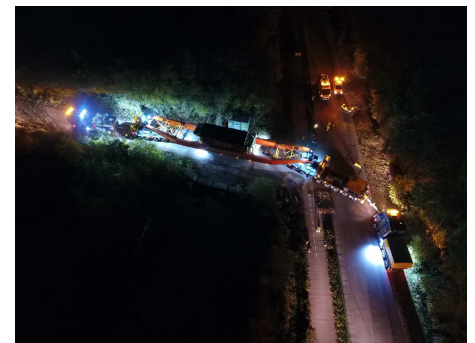
The newly arrived 400 kV power transformer will be the sixth such device in CERN's fleet. With a height of 9.7 metres, a length of 15.8 metres and a width of 3.9 metres, the completely assembled transformer will weigh 331.9 tonnes, making it twice as large as any of the existing power transformers at CERN. Baptised "Olive" for the olive-green colour of its tank, it will be filled with 82 000 litres of insulation oil once it is fully installed. It will be energised in early December, and is scheduled to be fully operational at the beginning of 2019. Olive will supply CERN for a significant part of the second Long Shutdown (LS2), when the other five 400 kV transformers are shut down for maintenance.

Olive is designed to respect the strictest environmental standards, and its specially constructed noise-cancellation panels make it extremely quiet for a power transformer of its size. In addition, the new BE2 electrical substation contains an advanced oil-retention and fire-suppression system to protect the environment in the unlikely event of a fire or an oil leak.

"The new BE2 electrical substation relies on industrial products and services from Switzerland, the Netherlands, France, Portugal, Germany, Italy, Spain and Hungary through several contracts placed by CERN. A number of pieces of high-voltage equipment in the existing 400 kV substation in Prévessin will also be replaced during LS2 in the framework of the project", says Marko Wolf, project manager in the EN-EL group.

This substation is the result of more than four years of work in conjunction with mul-

multiple stakeholders, notably RTE France (*Réseau de Transport d'Electricité*), who built an additional transmission feeder bay in their 400 kV Bois-Tollot substation to connect to the BE2 substation.

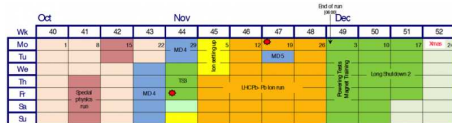


The whole structure travelled to Geneva mostly at night, in a 66-metre-long convoy, moving at 10 km/h on average. (Image: Marko Wolf/CERN)

Cristina Agrigoroae

LHC REPORT: A BUSY END OF THE PROTON RUN

The final days of the LHC proton physics Run II are here



The LHC schedule following the approval of the special physics run and the addition of the 4 extra Machine Development (MD) days. The two special physics days in week 42 have become luminosity production days.

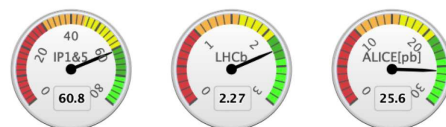
The last LHC Report mentioned that the schedule contained a seven-day special run block placeholder in week 41 for the low-energy and high-beta run and that a final decision on the subject would be made following a test run on Tuesday, 2 October.

The results of this test were analysed by the ATLAS-ALFA and TOTEM experiments and, after discussion with the machine teams on the run strategy, it was ultimately decided to perform the run, but to shift its start to Thursday, 11 October and limit its duration to six days, which means we will have another week of luminosity production before ending the proton run on 23 October.

The set-up of the required machine conditions was very efficient and the machine availability during this special run was higher than anticipated. As a result, the special physics run was completed earlier than expected on Sunday night, with over a million events per experiment, allowing the luminosity production to resume two days earlier than scheduled. Unfortunately, during the weekend, a filter in the cryogenics system at Point 8 started to clog, reducing the cooling capacity to less than that required for the high luminosity production. Consequently, it was decided on Monday morning to dedicate some time to solving the issue. Therefore, beam operation was not resumed until early on Tuesday morning, leaving one extra day for luminosity production nevertheless.

During the LHC Performance workshop that was held in Chamonix last January, a promise was made that if the luminosity production made it possible to reach the goal of 60 fb^{-1} for both ATLAS and CMS, extra machine development (MD) days would be allocated towards the end of the run in order to cope with the long list of topics to be studied before LS2.

Last week, just before starting the special physics run, this goal was reached and, as a result, four extra MD days were added to the final schedule, bringing the total number of days for the MD4 block to seven. This gave the MD coordination team an additional task, as well as the injectors team, who, besides making the final adjustments for the production of the lead ion beam, now also have to prepare and adjust the additional beam configurations required for the LHC MDs. This increases the workload during what is already a busy period, when everybody wants to take advantage of the last protons before LS2.

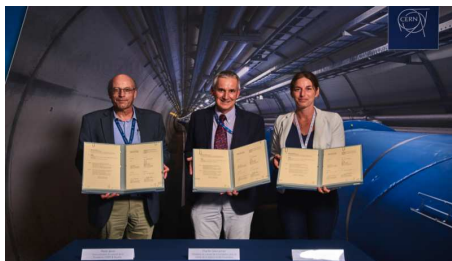


The values for the integrated luminosity in 2018. Left for ATLAS and CMS, middle for LHCb and right for ALICE.

Rende Steerenberg

ONE ENLARGED FOUNDATION TO BROADEN CERN'S IMPACT ON SOCIETY

On 6 June 2018, the CERN & Society Foundation and the Foundation for the Globe of Science and Innovation joined forces to become a single entity



From left to right: Peter Jenni, deputy chairperson of the CERN & Society Foundation board, Martin Steinacher, Director for Finance and Human Resources and president of the Foundation for the Globe

of Science and Innovation board, and Nathalie Leuenberger, member of the Foundation for the Globe of Science and Innovation board, after the official signature of the merger.

On 6 June 2018, the CERN & Society Foundation and the Foundation for the Globe of Science and Innovation joined forces to become a single entity with the ultimate goal of broadening their impact on society and optimising fundraising activities.

The Foundation for the Globe of Science and Innovation, established in 2007, and the CERN & Society Foundation, established in 2014, have in recent years successfully carried out complementary missions, sharing the overarching objective of promoting engagement in science in support of the broader mission of CERN.

After the merger, the combined Foundation will continue to have the name "CERN & Society Foundation", and the existing partnerships and projects of the two foundations will be brought together. The mission and activities of the Foundation for the

Globe of Science and Innovation will continue in the new framework.

Thanks to this merger, the enlarged CERN & Society Foundation will be able to take a more efficient and coordinated approach, better serving local and international communities.

“The enlarged Foundation will have the purpose to support and promote the dissemination, to the widest possible public, of the benefits of the mission of CERN through education and outreach, innovation and knowledge exchange, culture and

art; and the support and promotion of any related activities,” says Matteo Castoldi, Head of Partnerships and Fundraising and Secretary of the Foundation Board, which together with the CERN Legal Service has been instrumental in the merger and will be in charge of raising funds on behalf of the enlarged entity.

The purpose of the Foundation extends to supporting the operation of the Globe of Science and Innovation and promoting its use, notably as a venue for scientific exhibitions, conferences, meetings and debates open to the general public, in the

spirit in which the building was donated to CERN by the Swiss Confederation. The Foundation also supports the development of the Globe's infrastructure and, in particular, the capital campaign for the Science Gateway.

Following approval by the *Autorité fédérale de surveillance des fondations*, the merger entered into force on 11 October 2018. The Foundation for the Globe of Science and Innovation ceased to exist that same day.

CERN & Society

EVOLVING HOW WE WELCOME NEWCOMERS TO CERN

In 2018, the HR Learning and Development and Talent Acquisition teams initiated a complete review of how we welcome newcomers



In close collaboration with all CERN departments, the first 'all-new' Welcome Session took place on 1 April this year in the Globe of Science and Innovation (Image: Lavy, Rachel Tessa/CERN)

Do you remember your first day at CERN? Were you excited, maybe a little nervous? So much to do, so much to know, so much to take in. . . On the first day of each month, new members of personnel join CERN to start a new chapter in their career. The adage “You never get a second chance to make a first impression” holds true: their first impressions are crucial, and can set the tone for the entire experience they will have over the coming months and years.

In 2018, the HR Learning and Development and Talent Acquisition teams initiated a complete review of how we welcome newcomers. In the past, the comprehensive onboarding experience was dedicated to staff and fellows only, but our Director-General gave us the impetus to

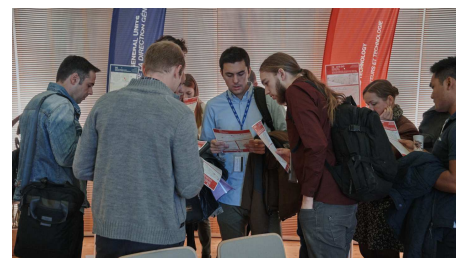
redesign the process based on a global concept that would meet the common core needs of all CERN's members of personnel.

In close collaboration with all CERN departments, the resulting first 'all-new' Welcome Session took place on 1 April this year in the Globe of Science and Innovation. Every month since then, tens, and sometimes hundreds, of new staff members, fellows, students, trainees and associates have come together to meet each other and learn more about CERN as an organisation, its culture and spirit in an interactive welcome enabling them to connect and network before joining their respective departments.

However, the onboarding journey starts well before the arrival at CERN and continues months after. The Welcome Session is therefore complemented by a comprehensive “Welcome to CERN” website (<https://hr-dep.web.cern.ch/content/i-arrive>) to support newcomers, providing information on what they need to know and what they need to do to prepare. Pascale Goy, Head of Learning and Development in CERN's HR department, explains: “The newly streamlined and modernised programme experienced by our newcomers today is the result of an brainstorming ex-

ercise across the HR department and beyond. Over 50 people throughout CERN were involved in this change process. This project was an enriching experience and probably one of the best ways to delve into the inner workings of CERN.”

Once at CERN, newcomers, alongside new users who have recently joined CERN, are invited back to attend the quarterly onboarding session, where, equipped with their own experience of their first few months, they learn more about all the different facets of the Organization: from an introduction to CERN's activities, Knowledge Transfer, the Library, clubs, the Staff Association, Education, Communication and Outreach. . . and more. At the end of this informative and interactive event, they also meet with the DG and Directors.



Human Resources Department

A NEW MANAGEMENT FOR CMS IN 2018

On 1 September 2018, a new spokesperson and two deputies took over at the helm of the CMS experiment



Roberto Carlin (centre), the new CMS spokesperson surrounded by his two deputies Patricia McBride and Luca Malgeri (Image: Maximilien Brice/CERN)

On 1 September 2018, a new spokesperson, Roberto Carlin, and two deputies, Patricia McBride and Luca Malgeri, took over at the helm of the CMS experiment for a period of two years.

The new team will lead the collaboration through an important period that will include analysis of the CMS 2018 data and the full 13-TeV dataset, the Long Shutdown 2 (LS2) activities, which involve completing Phase 1 upgrades and beginning Phase 2

construction, and preparation for LHC Run 3.

Read more on CMS website: "New management begins mandate (2018-2020) (<http://cms.cern/news/new-cms-management-2018-2020>)"

CERN, GUEST OF HONOUR AT FERNEY-VOLTAIRE FÊTE DE LA SCIENCE

On 13 October 2018, CERN was guest of honour of the City of Ferney-Voltaire for the Fête de la Science, organised by the association Pangloss



On Saturday, 13 October 2018, CERN was guest of honour of the City of Ferney-Voltaire for the *Fête de la Science*, organised by the association Pangloss in the gardens of the Château de Voltaire.

The historic Orangery and Garden have turned into a science village, housing the stands of nearly thirty associations and sci-

entific institutions. 2,000 visitors of all ages came to enjoy the wide range of activities.

As a privileged guest, CERN offered a great number of activities. Visitors were able to visit the LHC and the Computing Centre with virtual-reality headsets. They analysed particle collisions in search of the Higgs boson with the "Connect the dots" activity. The little ones revisited the aesthetics of the ATLAS experiment with a colouring book. The majority of visitors left with a badge showing the elementary particle best reflecting their personality, after responding to the quiz "Particle Identities". And physics demonstrations with everyday objects impressed both young and old.

A must-attend CERN activity, the three "Fun with Physics" shows have sold out!

The impressive explorations of the states of matter and the effects of liquid nitrogen have met a great success.

Nearly 20 CERN volunteers brilliantly represented their laboratory, adapting perfectly to the expectations of the general public to explain their daily activities. Thank you to them!

Do you work at CERN and want to become a volunteer at local events? Join our Workplace Group CERN outreach events volunteers.

Marie Bouvier

COMPUTER SECURITY: LINUX: WINDOWS REVISITED

Linux and MacOS folks: do as the Windows people do. Be diligent when receiving unsolicited e-mails with weird attachments

In the past, “infections” were usually only a matter for PCs and laptops running Microsoft’s Windows operating systems. Windows users should (and, at CERN, must!) apply due diligence to protect their system by, for example, safe browsing and avoiding opening attachments from dubious sources (“Stop – Think – Don’t click”). Users of Linux or MacOS operating systems were thought to be less prone to such kinds of infections. . . but that is plain wrong.

Computer viruses usually exploit weaknesses and vulnerabilities in the underlying operating system. As the erstwhile market leader, Windows was the number one choice for cyber-attackers due to its large market share. The success rate in infecting Windows PCs was very high. But this has changed in two ways. First of all, MacOS has become very popular too, and cyber-attackers now also tar-

get devices running MacOS and iOS – as well as Android tablets and smartphones. Secondly, attackers are focusing less and less on the weaknesses of the operating system, but are increasingly looking into the vulnerabilities of software applications. The best outcome for hackers is if these applications work on all three major operating systems (Windows, MacOS, Linux), like Adobe Reader or Mozilla Firefox. With one good vulnerability, you can exploit them all. . . An excellent example is the recent publication of a vulnerability in the beloved “Ghostscript” application (and subsequently in “ImageMagick” and “GraphicsMagick”): with one malicious PDF, XPS, PS or EPS document and one single unsuspecting click by the innocent user, your Linux computer is a goner. The operating system infiltrated. All files exposed. Any communication tapped. This sort of thing from our *Bulletin* article on “Protect your Family”. Game over, Linux.

So, Linux and MacOS folks: do as the Windows people do. Be diligent when receiving unsolicited e-mails with weird attachments (see our *Bulletin* article on “A free click for your awareness”). Stop and think before clicking on weird-looking web links or URLs stemming from unknown or untrustworthy sources (“Curiosity clicks the link”). And always keep your operating system and all applications up-to-date. “Yum autoupdate” is your best friend.

Do you want to learn more about computer security incidents and issues at CERN? Follow our Monthly Report. For further information, questions or help, check our website or contact us at Computer.Security@cern.ch.

The Computer Security Team

Announcements

THE FLU: PROTECT YOURSELF AND OTHERS

Every year, in Switzerland, the flu is responsible for between 100 000 and 250 000 visits to the doctor, 1000 to 5000 hospitalisations and several hundred deaths. In France, the number of medical consultations for flu-like symptoms during the 2017/18 season was estimated at 2.4 million and an estimated 53% of patients hospitalised with the flu were aged 65 or over. 81% of patients with serious cases of flu requiring life support had at least one risk factor, generally age (47% were over 65 years old), and/or one or more chronic conditions. In France, the excess mortality attributable to the flu during the 2017/2018 season was estimated at 12 980 deaths.

The flu vaccine has proved its worth by halving the number of flu-related hospital-

isations, and it lessens the severity of the symptoms.

Carriers can spread the flu virus without experiencing symptoms themselves, so it is easily passed to vulnerable people for whom it could be fatal.

The flu vaccine is safe, simple and effective and is officially recommended for the over-65s, pregnant women, obese people (BMI greater than or equal to 40) and those in regular contact with infants under six months old.

Other adults can also be vaccinated for their own benefit, as well as for the benefit of vulnerable people around them.

Your doctor, nurse or pharmacist and the members of CERN’s Medical Service can answer any questions you may have about the flu vaccine.

The health professionals in the CERN Medical Service can prescribe and administer the vaccine.

More information can be found on our website: <https://medical-service.web.cern.ch/>

CERN Medical Service

ROUTE ARAGO IS ONCE MORE OPEN TO TRAFFIC

Civil-engineering work for the MEQ59 platform is now complete and Route Arago is once more open to traffic. However, please

drive carefully as signals and traffic markings are not yet installed on the road.

SMB Department

16 AND 17 OCTOBER: TRAFFIC DISRUPTION IN GENEVA

The Geneva police has informed us that on Tuesday 16 October and Wednesday 17 October, traffic disruption is expected in the Canton of Geneva between 6.00 a.m. and 5.00 p.m. due to the UNIA trade-union demonstration.

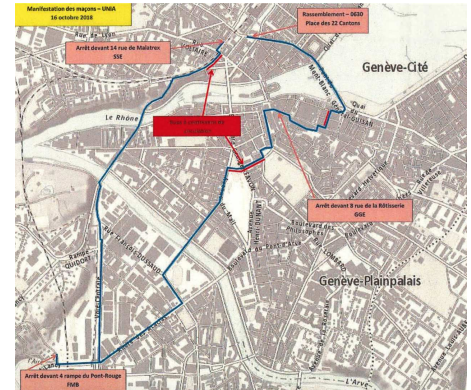
In particular, the circulation on the following roads will be severely disrupted (see map):

Place des 22-Cantons, Rue de Chantepoulet, Rue du Mont-Blanc, Pont du Mont-Blanc, Rue du Rhône, Rue Basses, Place de Neuve, Boulevard Georges-Favon, Avenue du Mail, Boulevard Saint-

Georges, Rue de l'Ecole-de-Médecine, Route des Acacias, Carrefour de l'Etoile, Route du Grand-Lancy, Rampe du Pont-Rouge, Route des Jeunes, Rue des Deux-Ponts, Rue de Sous-Terre, Rue de Saint-Jean, Rue de la Servette, Rue Voltaire and Rue de Lyon.

Several no-parking zones have been demarcated.

Please respect the temporary road signs and any orders given by the police.



The route that the demonstration will take between 7.15 a.m. and 4.00 p.m on Tuesday, 16 October, and Wednesday, 17 October.

QUANTUM COMPUTING FOR HIGH-ENERGY PHYSICS

CERN openlab is organising a first-of-its-kind workshop on quantum computing on 5-6 November (<https://indico.cern.ch/e/QC18>). The event will take place in the CERN Main Auditorium, and will also be webcast live: <https://webcast.web.cern.ch/event/i719844>.

The ambitious upgrade programme for the LHC will result in significant challenges related to information and communications technologies (ICTs) over the next decade and beyond. It is therefore vital that we — members of the high-energy physics (HEP) research community and beyond — keep looking for innovative technologies, so as to ensure that we can continue to maximise the discovery potential of the world-leading research infrastructures at our disposal. Technologies related to quantum computing hold the promise of substantially speeding up computationally expensive tasks.

While significant developments are being made in the field of quantum computing, today's hardware has not yet reached the level at which it could be put into production within our community. Both established computing vendors and start-up companies are carrying out important activity in this field. Nevertheless, it remains difficult to foresee when more stable hardware — capable of providing concrete benefits for the HEP community — will be available.

Given both the potential and the uncertainty surrounding quantum computing, it is important to explore what these new technologies could bring to our field. It is also incumbent upon us to improve our understanding of which of our activities could most benefit from quantum-computing algorithms, as well as working to understand what the overall impact on the computing models used within HEP are likely to be. A

large part of this work can be carried out today using on quantum simulators.

To ensure this activity is a success, it is vital that we bring the whole community together, fostering common activities and knowledge sharing. CERN openlab is therefore capitalising on its deep connections with the HEP community and its well-established links across many of the world's leading ICT companies to set up this kick-off workshop. As well as providing a forum for sharing knowledge and ideas, the event will serve to provide an overview of the current state of quantum-computing technologies and will help us all to understand which activities within the HEP community most well suited to the application of such technologies.

CERN openlab

NOVAE: TABLE SERVICE EVERY DAY IN RESTAURANT 1

From 15 October 2018, table service will be available every day in Restaurant 1 at "Côté Bistrot", located at the entrance to the Glass Box.

Set menu: 20 CHF per person:

Salad
Dish of the day

Mineral water
Tea or coffee

Dessert: 3.50 CHF

Wines:

Gamay les Faunes (1 dl) 2.50 CHF
Chasselas les Faunes (1 dl) 2.50 CHF

Quille Gamay les Faunes (5 dl) 10.50 CHF
Gamay les Faunes (bottle) 18.00 CHF
Pinot noir les Faunes (bottle) 21.00 CHF
Chasselas les Faunes (bottle) 18.00 CHF

APPLY NOW FOR THE 2019 ESIPAP SCHOOL



Registration for the 2019 session of the European School of Instrumentation in Particle and Astroparticle Physics (ESIPAP) is now open.

The deadline for submission of the full application form is **31 October 2018** (late applications may be considered in the light of available places).

Applications are welcome from staff, fellows and post-graduate students wishing to further their knowledge in the field.

For more information please visit www.esipap.eu

APPLY NOW FOR THE 2019 JUAS SCHOOL



Registration for the 2019 session of the Joint Universities Accelerator School (JUAS) is now open.

The deadline for submission of the full application form is **31 October 2018** (late applications may be considered in the light of available places).

Applications are welcome from staff, fellows and post-graduate students wishing to further their knowledge in the field.

For more information please visit www.juas.eu

MOBILE PRIVATE SUBSCRIPTION CHANGES

Given the significant evolution in the mobile telephony market over the past 20 years and the likely future changes, **the private option for CERN mobile telephony subscriptions will be withdrawn as from 1 February 2019.**

CERN members having opted for the private option will be notified individually and are invited to make alternative arrangements by 31 January 2019.

Private subscription will be suspended on 1 February 2019 so only your professional subscription will remain. Please follow this link (<http://information-technology.web.cern.ch/book/gsm-mobile-phone/gsm-subscriptions/private-subscription>) for further details. Note that new requests for private subscriptions are no longer accepted.

As a reminder, private calls to the local area (+4122, +4121 and +33450) are tolerated from both fixed-line and mobile phones. Note, though, that calls are logged to monitor for cases of abuse.

Communications Systems group, IT Department

FAXES REACH THE END OF THE LINE

A fax machine is a device that, just like an old modem, transmits data by sound — many of us will have heard this by calling a fax number by mistake. Unfortunately, this system, which worked well when the phone service was a circuit-switched service with copper wires, is not compatible with today's IP and fibre based telephony services.

Switzerland recognised this, as well as the existence of adequate replacement technology, when a new 'Ordinance on Telecommunications Services' was

adopted in December 2016: this ordinance removed the obligation on telecom providers to support a fax service as part of their universal service obligation.

Since many outgoing calls are routed via Swiss telecom providers, **CERN can no longer guarantee that faxes will be transmitted correctly** — or indeed at all. Note that this problem concerns the email2fax service just as much as it concerns the sending of faxes from a physical machine.

Many alternatives to fax transmission now exist — from sending scanned documents or pdf files via email to the secure sharing of documents online (for example using the CERNBox service). If you are still sending (or receiving) faxes, we strongly recommend that you discuss moving to a different mechanism for document sharing with your correspondents.

*Communications Systems group, IT
Department*