CERN Bulletin

Issue No. 9-10/2020-Wednesday 26 February 2020
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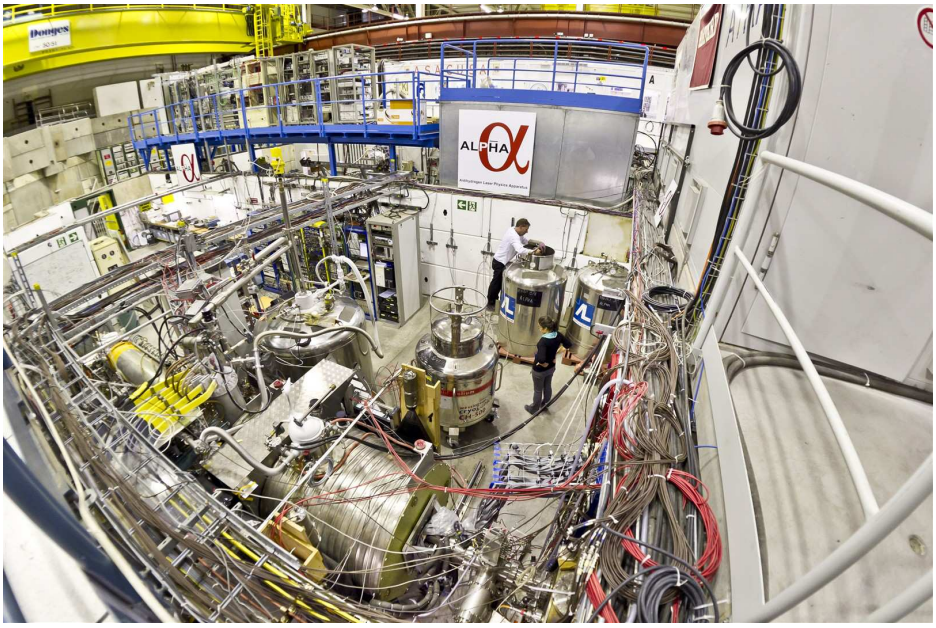
ALPHA COLLABORATION AT CERN REPORTS FIRST MEASUREMENTS OF CERTAIN QUANTUM EFFECTS IN ANTIMATTER

The measurements are consistent with predictions for "normal" matter and pave the way for future precision studies



The ALPHA experiment in the Antiproton Decelerator hall at CERN (Image: CERN)

The ALPHA collaboration at CERN has reported the first measurements of certain quantum effects in the energy structure of antihydrogen, the antimatter counterpart of hydrogen. These quantum effects are known to exist in matter, and studying them could reveal as yet unobserved differences between the behaviour of matter and antimatter. The results, described in a paper published today in the journal *Nature*, show that these first measurements are consistent with theoretical predictions of the effects in "normal" hydrogen, and pave the way for more precise measurements of these and other fundamental quantities.

"Finding any difference between these two forms of matter would shake the foundations of the Standard Model of particle physics, and these new measurements probe aspects of antimatter interaction – such as the Lamb shift – that we have long looked forward to addressing," says Jeffrey Hangst, spokesperson for the ALPHA experiment. "Next on our list is chilling large samples of antihydrogen using state-of-the-art laser cooling techniques. These techniques will transform antimatter studies and will allow unprecedentedly high-precision comparisons between matter and antimatter."

(Continued on page 2)

A WORD FROM JAMES PURVIS

SEVEN SECRETS TO ENSURE A SUCCESSFUL AND HEALTHY WORKING LIFE

It has been a little over two years since we launched the Work Well Feel Well initiative at CERN. This year we have a lot of activity planned in the form of a 12-point campaign to boost awareness of mental health issues in the workplace. Within the overall theme of combining efficiency with kindness at work, the campaign will run for two years, and kick off with a presentation on 5 March entitled: "Seven secrets to engage without becoming overwhelmed".

(Continued on page 2)

In this issue

Published by:
CERN-1211 Geneva 23, Switzerland writing-team@cern.ch
Printed by: CERN Printshop

CERN-ISSN: **Printed version:** 2011-950X
Electronic Version: 2077-9518

A WORD FROM JAMES PURVIS

SEVEN SECRETS TO ENSURE A SUCCESSFUL AND HEALTHY WORKING LIFE

The campaign aims to promote a culture of mental wellbeing in the Organization by raising awareness among the CERN population of the issues, danger signals and triggers that can lead to burnout, and how to spot them before it is too late. Over recent years, burnout and absenteeism have been on the rise generally in the global workforce, and experience has led to the conclusion that self-awareness is the key to prevention. We are all different, and all of us react in different ways to different situations that may incur workplace stress. Knowing our individual limits, and understanding how to recognise danger signals in our colleagues and supervisees, is the key to staying healthy.

So what are the secrets to getting the most out of work without it becoming overwhelming? The Work Well Feel Well team has joined up with the Clinique du Travail, a multidisciplinary team of specialists in workplace health, to let us know. Come to the presentation on 5 March at 2.00 p.m. in the Council Chamber to find out more...

The presentation will be in French with simultaneous translation into English.

James Purvis
Head of the Human Resources department

ALPHA COLLABORATION AT CERN REPORTS FIRST MEASUREMENTS OF CERTAIN QUANTUM EFFECTS IN ANTIMATTER

The ALPHA team creates antihydrogen atoms by binding antiprotons delivered by CERN's Antiproton Decelerator with antielectrons, more commonly called “positrons”. It then confines them in a magnetic trap in an ultra-high vacuum, which prevents them from coming into contact with matter and annihilating. Laser light is then shone onto the trapped atoms to measure their spectral response. This technique helps measure known quantum effects like the so-called fine structure and the Lamb shift, which correspond to tiny splittings in certain energy levels of the atom, and were measured in this study in the antihydrogen atom for the first time. The team previously used this approach to measure other quantum effects in antihydrogen, the latest being a measurement of the Lyman-alpha transition.

The fine structure was measured in atomic hydrogen more than a century ago, and laid the foundation for the introduction of a fundamental constant of nature that describes the strength of the electromagnetic interaction between elementary charged particles. The Lamb shift was discovered in the same system about 70 years ago and was a key element in the development of quantum electrodynamics, the theory of how matter and light interact.

The Lamb-shift measurement, which won Willis Lamb the Nobel Prize in Physics in 1955, was reported in 1947 at the famous Shelter Island conference – the first important opportunity for leaders of the American physics community to gather after the war.

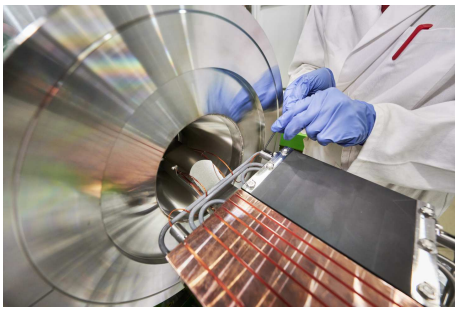
Technical Note

Both the fine structure and the Lamb shift are small splittings in certain energy levels (or spectral lines) of an atom, which can be studied with spectroscopy. The fine-structure splitting of the second energy level of hydrogen is a separation between the so-called $2P_{3/2}$ and $2P_{1/2}$ levels in the absence of a magnetic field. The splitting is caused by the interaction between the velocity of the atom's electron and its intrinsic (quantum) rotation. The “classic” Lamb shift is the splitting between the $2S_{1/2}$ and $2P_{1/2}$ levels, also in the absence of a magnetic field. It is the result of the effect on the electron of quantum fluctuations associated with virtual photons popping in and out of existence in a vacuum.

In their new study, the ALPHA team determined the fine-structure splitting and the Lamb shift by inducing and studying transitions between the lowest energy level of antihydrogen and the $2P_{3/2}$ and $2P_{1/2}$ levels in the presence of a magnetic field of 1 Tesla. Using the value of the frequency of a transition that they had previously measured, the 1S–2S transition, and assuming that certain quantum interactions were valid for antihydrogen, the researchers inferred from their results the values of the fine-structure splitting and the Lamb shift. They found that the inferred values are consistent with theoretical predictions of the splittings in “normal” hydrogen, within the experimental uncertainty of 2% for the fine-structure splitting and of 11% for the Lamb shift.

LS2 REPORT: INNOVATION TO STOP PROTONS IN THEIR TRACKS

Two new beam dumps are ready to be installed in the Proton Synchrotron



New PS internal dump produced in the framework of the LIU project (Image: Julien Ordan/CERN)

The old Proton Synchrotron (PS) is being decked out with ultra-modern equipment. As part of the LHC Injectors Upgrade (LIU) project, two novel beam dumps will be installed in the PS during the Long shutdown 2, in April, with a third waiting in the wings as a spare. Two of the three dumps are almost ready and will be commissioned following metrology checks and acceptance tests for the ultra-high vacuum. This equipment will enable the PS operators to stop any type of beam circulating in the machine when necessary and thus contributes to the safe operation of the accelerator.

This innovating beam dump is made of two materials, the second denser than the first, which absorb the energy of the particle beam. A first isostatic graphite block is used for its excellent resistance to thermal shock. The beam then meets a block made of copper, chromium and zirconium alloy, hot isostatically-pressed on three stainless steel tubes where the cooling water circulates. This last block efficiently evacuates the energy from the beam.

The new beam dump works differently to those normally used at CERN, where particles are deflected by a kicker magnet towards a static dump. Instead, the PS's new beam dump moves to meet the beams, oscillating to block the vacuum chamber so that the particles' trajectory does not need to be deflected.

The dump block oscillates up and down, gradually stopping all the beam particles. This technique is being used due to space constraints in the Proton Synchrotron: installing a static dump would have also required the addition of a beam extraction system which would take up too much room.

For François-Xavier Nuiry, the project leader, this is the culmination of more than four years spent developing a highly complex piece of equipment. “From the very beginning, the team's commitment has amazed me. These beam dumps would not be here if it weren't for their collective effort. It was also a great opportunity to train students and fellows in highly technical fields.”

Thomas Hortala

HOW PARTICLE PHYSICS COULD PREVENT FINANCIAL FRAUD

A new collaboration agreement sees CERN data analytics used to help protect commodity and financial markets from fraud

Similarities between the billions of particle collisions in CERN's Large Hadron Collider and the high-speed trading on commodity futures markets have led to a new research collaboration (Image: Roger Claus/CERN)

Every day, commodity markets trade millions of food ingredients and more, so detecting fraud can be challenging. A new collaboration agreement between CERN, the Commodity Risk Management Expertise Center (CORMEC) and Wageningen University & Research (WUR) will now use advanced data analytics from particle physics to help protect commodity and financial markets from fraud. The insights gained could be used by governments and regulators to improve market stability.

During a visit to CERN, WUR economics professor Joost Pennings realised the similarities between the billions of particle collisions in CERN's Large Hadron Collider and the high-speed trading on commodity futures markets. Most transactions, or collisions, show no anomalies. But when they do, this may lead to new ground-breaking insights for both economists and physicists.

Hence this new collaboration plans to combat fluctuations in markets caused by anomalies, by combining the unique commodity and financial market data and understanding from CORMEC and WUR with CERN's ROOT data analysis expertise and techniques.

<blockquote> “We see that ROOT, CERN's scientific big data analytics framework, has the potential to be a game changer for finance data analytics. It's exciting that ROOT can serve society also outside its core domain of high-energy physics.”

– Dr Axel Naumann, CERN senior applied physicist and ROOT project leader

</blockquote> This collaboration will use data analytics to diagnose manipulation in commodity and financial markets. This should enable regulators to create safer and more stable environments for trading, leading to improved regulation and market integrity. The research may also lead to new diagnostic tools for predicting finan-

cial instability, which will indirectly help risk management.

The three-year knowledge-transfer project is named HighLo (High Energy Physics Tools in Limit Order Book Analysis) and is supported by the Province of Limburg in the Netherlands. The first results are expected at the end of 2020.

MOEDAL HUNTS FOR DYONS

The MoEDAL collaboration at CERN reports the first search at a particle accelerator for particles with both electric and magnetic charge

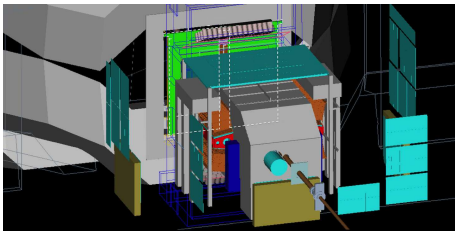


Illustration of the MoEDAL detector system (gold and light blue components), surrounding the LHCb experiment's VELO detector (central grey structure) (Image: CERN)

A magnetic monopole is a theoretical particle with a magnetic charge. Give it an electric charge, and you get another theoretical beast, dubbed a dyon. Many "grand unified theories" of particle physics, which connect fundamental forces at high energies into a single force, predict the existence of dyons, but no experiments at particle accelerators have so far searched for these hybrid particles – until now. The MoEDAL collaboration at CERN, which was designed to search for magnetic monopoles, has just scored two firsts with the first search for dyons at the Large Hadron Collider (LHC) and, more generally, at any particle accelerator.

The collaboration conducted the search using the experiment's second subdetector system, which consists of about 2400 aluminium bars with a total mass of 794 kg. The bars were exposed to proton-proton collisions produced at the LHC at an energy of 13 TeV between 2015 and 2017. A special device was then used to scan the bars and look for the presence of trapped magnetic charge belonging to dyons.

This scanning procedure found no signs of dyons. However, assuming that the dyons would be produced in the collisions as pairs emerging from a photon, the negative result allowed the MoEDAL team to narrow the region of where to search for dyons. The researchers ruled out the existence of dyons that carry a magnetic charge ranging up to six units of a fundamental magnetic charge (the Dirac charge) and an electric charge up to 200 times the electron's charge – for dyons with a mass between 830 and 3180 GeV.

Commenting on the results, MoEDAL spokesperson James Pinfold said: "Nobel-prize winner Julian Schwinger first hypothesised the dyon in 1969. He used it to build what he called a magnetic model of matter. Amazingly, he used this model to successfully predict the existence of the J/Psi particle before its discovery in 1974. Today, dyons are predicted by many particle-physics theories. Naturally, I was surprised that, before MoEDAL, no explicit experimental search for this exciting entity at an accelerator had ever been performed."

The collaboration is now preparing to continue its searches for monopoles and dyons, as well as other exotic particles, during the next LHC run, which starts in 2021. "We're planning to expand our experimental sensitivity to other avatars of new physics phenomena, including fractionally charged particles with charge as low as one thousandth the electric charge and very long-lived weakly interacting neutral particles. We expect the next run to be a very exciting one," Pinfold concludes.

Ana Lopes

CERN CONGRATULATES CNAO ON A WORLD'S FIRST PROTON TREATMENT OF A CARDIAC PATHOLOGY

A cancer therapy synchrotron that CERN helped to establish has treated a patient with ventricular arrhythmia for the first time

Treatment room of the CNAO hadrontherapy centre (Image: CNAO)

The CNAO (*Centro Nazionale di Adroterapia Oncologica*) hadrontherapy centre in Pavia, Italy, hit the headlines in January, when for the first time in the world, a patient with ventricular arrhythmia was treated with proton beams. Ventricular arrhythmia is an abnormality of the heart's rhythm and can prevent oxygen-rich blood from circulating around the body. In this particular case, the patient was suffering from frequent cardiac arrests.

Hadrontherapy centres such as CNAO routinely use proton beams to treat cancer, exploiting the beams' property of depositing energy very precisely in the tumour region, while not damaging surrounding healthy tissue. For this cardiac patient, who had not responded to any drugs or traditional interventions, doctors decided to bombard the part of the heart responsible for causing the irregular heartbeats with a proton beam. The procedure was a success and the 73-year-old patient is recovering well.

CERN and CNAO have a long-standing collaboration, which dates back to the design phase of the treatment centre. In the early 1990s, under the impulsion of Ugo Amaldi, CERN hosted and contributed to the Proton-Ion Medical Machine Study (PIMMS), which aimed to combine efforts and expertise in order to optimise a design for a cancer therapy synchrotron. The PIMMS concept was made publicly available and, after further enhancement by Amaldi's TERA foundation, evolved into the final CNAO accelerator, with seminal contributions from INFN; the MedAustron centre in Wiener Neustadt, Austria, was then based on the CNAO design. CERN continues to collaborate with CNAO and MedAustron by sharing its expertise in accelerator and magnet technologies.

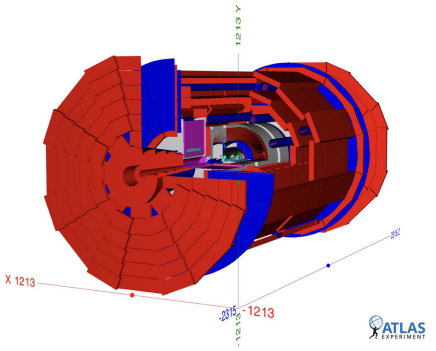
CNAO is one of only six centres in the world able to perform hadrontherapy with both proton and carbon ions and has treated more than 2700 cancer patients since opening in 2011. Perhaps this is just the start of using hadrontherapy outside of the field of oncology. It is another perfect example of how tools developed by particle physicists, to pursue their scientific goals, can have beneficial (sometimes even unexpected) applications well outside the walls of CERN and other basic research laboratories.

As CNAO keeps expanding its therapeutic reach, for example through the addition of a new dedicated proton therapy system, and CERN starts its NIMMS (Next Ion Medical Machine Study) programme to develop technologies for ion therapy, one can expect numerous synergies and collaborations in the years to come.

Helen Dixon-Altaber

ATLAS RELEASES 13-TEV OPEN DATA FOR SCIENCE EDUCATION

The collaboration has made public the data of 1 quadrillion proton-proton collisions from the LHC's last run



3D visualisation of the ATLAS detector using the tools provided for analysing the open data (Image: ATLAS collaboration/CERN)

The ATLAS collaboration has just released the first open dataset from the Large Hadron Collider 's (LHC) highest-energy run at 13 teraelectronvolts (TeV). The new release is specially developed for science education, underlining the collaboration's long-standing commitment to students and teachers using open-access ATLAS data and related tools.

ATLAS has made public 10 inverse femtobarns (fb $^{-1}$) of the 13-TeV data, which corresponds to about 1 quadrillion proton-proton collisions, or 500 thousand produced Higgs bosons. It is also approximately the same amount of data that the ATLAS collaboration used to discover the Higgs boson in 2012. The datasets, software and tools are available on the ATLAS public website and on the CERN Open Data Portal.

“Our high-energy collision open data, recorded during the second run of the LHC, provides insight into the real world of particle-physics analysis. Students, scholars and interested members of the public will be able to reproduce ATLAS physics results in a fully realistic manner, understanding for themselves the fascinating study of nature at its deepest level”, says Karl Jakobs, ATLAS spokesperson.

ATLAS has also released new simulated data sets and web-based and offline analysis software, as well as extensive documentation and tutorials. “These are the tools of a particle physicist's trade, allowing us to go from data-taking to physics measurements and eventually discovery,” says Arturo Sánchez Pineda, co-leader of the ATLAS Open Data team (University of Udine, ICTP and INFN, Italy). “Simulated datasets allow physicists to compare theory with real data. They are based on theoretical models of the expected physics processes taking place in the collisions, together with a detailed description of the ATLAS detector. By providing such resources, we hope to empower students, professors and dedicated self-learners worldwide to learn and teach experimental particle physics, as well as the computer science behind the field.”

An exciting feature of the new open-data release is its ability to put learners in the role of the “discoverer”. “For the first time, students will be able to 're-discover' the Higgs boson (in three different decay channels) and can even search through the data for physics beyond the Standard Model, such as dark matter.” explains Kate Shaw, co-leader of the ATLAS Open Data team (University of Sussex, UK). “These new avenues for study will greatly enhance understanding of the experimental side of data analysis – a particular advantage for budding researchers.”

This text is based on an article published by the ATLAS collaboration.
Read the full article on the ATLAS website.

COMPUTER SECURITY: MALICIOUS ROBOTS

“Stop – Think – Don't Click” is one of the standard pieces of advice when you are asked to click on links to unsolicited, unknown or dubious webpages

“Stop – Think – Don't Click” is one of the standard pieces of advice when you are asked to click on links to unsolicited, unknown or dubious webpages, or when browsing the web in general. To paraphrase the words of Forrest Gump: “My momma always said, ‘[browsing the Internet is] like a box of chocolates. You never know what you're gonna get.’ Once again he is right. And here is a new twist in the way attackers try to dupe you into clicking on their malicious content. . . Captchas.

‘Captchas’ are a kind of online proof that you are a human being with human cognitive capabilities and not an automatic software algorithm (a so-called ‘bot’). Usually a Captcha verification asks you to copy a series of letters inside a distorted image, sometimes with the addition of an obscured sequence of letters or digits, or to identify a certain subset of photos within an array of many (‘Select all pictures displaying cars’). In the age of the rise of artificial intelligence, big data and massive offices full of cheap office labour (in particular in third-world countries), one can start questioning how efficient and effective those Captcha verifications are, but for the attackers that is not the point. They just want you to click. . .

Their embedded Captcha dialog boxes look a bit different (see second screenshot). Once you click on them, your browser will pop up another window asking you for permission for the current website to be able to send notifications to you. And if you confirm, Captcha Gotcha. From that moment on, you will start seeing spam popups directly on your desktop even if your preferred web browser is closed. These can be ads for adult sites, online web games, fake software updates and unwanted programs...

Fortunately, notification permissions can easily be disabled again in the settings of any browser. In addition, you might want to consider improving your privacy when browsing the web (see our *Bulletin* article ‘Browsing securely and privately’). And, best of all: once more ‘Stop – Think – Don't Click’ when you are not sure where you are going: ‘Browsing the Internet is like a box of chocolates. You never know what you're gonna get.’

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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.

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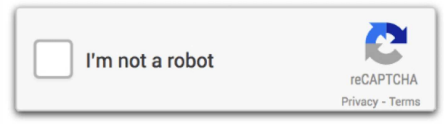

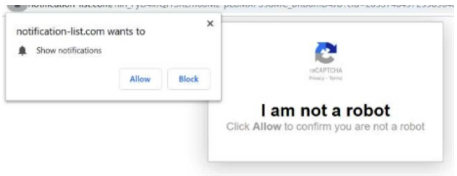

(Image: https://malwaretips.com/blogs/remove-notification-list-com/)

The Computer Security Team

Official communications

CORONAVIRUS: LATEST CERN INFORMATION

CERN continues to monitor the evolution of the novel coronavirus COVID-19

CERN continues to monitor the evolution of the novel coronavirus COVID-19. For up-to-date information, please see: https://hse.cern/news-article/coronavirus-recommendations.

UPDATE ON LINUX SUPPORT: CREATION OF A CERN LINUX COMMUNITY FORUM

Three Linux distributions for servers and desktops are officially supported at CERN via the Service Desk. A newly created CERN Linux community forum is available for all other distributions and for Linux laptops

The three Linux distributions for servers and desktops officially supported at CERN via the Service Desk are:

- CERN CentOS (CC)
- Scientific Linux CERN (SLC)
- Red Hat Enterprise Linux (RHEL), with a limited number of licences.

Other Linux distributions, such as Linux Mint, Debian, Ubuntu, openSUSE, Fedora, Manjaro Linux and Zorin OS, as well as Linux laptops, are not officially supported.

For those, a CERN Linux community forum has been created. Users will be able to post issues that they encounter when using non-CERN-supported Linux distributions and to post solutions. Users are also encouraged to post articles with comments and ideas that could help make this forum more dynamic and useful to them.

Various methods for printing and using AFS, SSH, ROOT and other tools at CERN can be found on the internet. The CERN Linux community forum aims to collect these methods, as well as new ones that may be created directly in it.

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For regular updates on your computing environment, please check the CERN computing blog (sign in to access). To receive automatic monthly updates, subscribe to the computing-blog-update e-group.

TAXATION IN SWITZERLAND

Memorandum concerning the 2019 annual certificates and the 2019 income tax declaration forms issued by the Swiss cantonal tax authorities

I - Annual internal taxation certificate and financial certificate for 2019

Depending on your status at CERN in 2019, the annual internal taxation certificate or the financial certificate for 2019, issued by the Finance and Administrative processes Department, is available since 7 February 2020 via HRT (*http://hrt.cern.ch/*) (under " My e-Documents and Self Services"). It is intended exclusively for the tax authorities.

1. If you are currently a member of the CERN personnel you have received an e-mail containing a link to your annual certificate, which you can print out if necessary.

2. If you are no longer a member of the CERN personnel or are unable to access your annual certificate as indicated above, you will find information explaining how to obtain one here (*https://admin-eguide.web.cern.ch/en/procedure/annual-internal-taxation-certificate*).

In case of difficulty in obtaining your annual certificate, send an e-mail explaining the problem to service-desk@cern.ch.

II - 2019 income tax declaration forms issued by the Swiss cantonal tax authorities

The 2019 income tax declaration form should be completed in accordance with the general indications available at this address (*http://admin-eguide.web.cern.ch/en/procedure/income-tax-declaration-switzerland*).

IF YOU HAVE ANY SPECIFIC QUESTIONS,
PLEASE CONTACT YOUR TAX OFFICE DIRECTLY.

This information does not concern CERN pensioners, as they are no longer members of the CERN personnel and are therefore subject to the standard national legal provisions relating to taxation.

HR Department
Contact: HR-Internal-tax@cern.ch

HR Department

WITHDRAWAL OF THE UNITED KINGDOM FROM THE EUROPEAN UNION (BREXIT)

CERN's Host States have published information about Brexit on the following websites:

- for France: https://brexit.gouv.fr/sites/brexit/accueil.html,
- for Switzerland: https://www.dfae.admin.ch/dea/en/home/verhandlungen-offene-themen/offene-themen/ brexit.html,
- (see also the HR Department's website: https://hr-dep.web.cern.ch/content/brexit-and-cern).

Furthermore, the Swiss and French authorities have confirmed that, as in the past,

- the Swiss Federal Department of Foreign Affairs will issue *cartes de légitimation*, and
- the French Ministry for Europe and Foreign Affairs will issue special residence permits (TSS) to British nationals who meet the required conditions.

In addition, the Gex *sous-préfecture* has provided the following information:

1. The withdrawal agreement provides for a transition period lasting until 31 December 2020, during which British nationals will retain all the rights accorded to them as European nationals, including exemption from the requirement to hold a residence permit. The provisions of this agreement apply to British nationals and their family members who were already residing in France on the date of the United Kingdom's withdrawal from the European Union or who take up residence in France before 31 December 2020. These individuals will receive specific "United Kingdom's EU withdrawal agreement" residence permits, for which they must apply before 1 July 2021. They will not be required to hold a residence permit before that date at the earliest. To handle online applications, a new website adapted to the provisions of the withdrawal agreement will be launched in summer 2020. The website launched on 9 October 2019 in preparation for a no-deal Brexit has now been taken down, but applications submitted before its closure will be kept so that the individuals concerned do not need to apply again (they will receive an e-mail informing them of this).

2. British nationals who arrive in France after 31 December 2020 will be subject to the provisions of common law or of any agreement that may be drawn up in the meantime.

3. The Secretary-General of the Gex *sous-préfecture* will participate in a **public information session**, which will be held in the CERN Council Chamber **from 10.30 a.m. until noon on 30 March 2020**.

Host States Relations Secretariat
relations.secretariat@cern.ch
72848 / 75152

Announcements

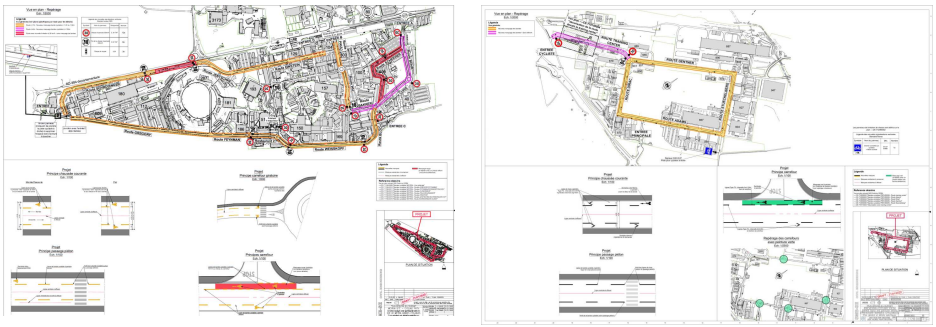
CREATION OF CYCLE LANES ON THE MEYRIN AND PRÉVESSIN SITES

Work will start on Monday 2 March on a network of new cycle lanes at CERN

Work is scheduled to begin on Monday 2 March on the creation of cycle lanes on the Meyrin site. This will be followed by similar work on the Prévessin site. A total of 10km of cycle lanes is foreseen, and work is due to be completed by 1 May at the latest.

Please be aware that workers may be active on the roads of CERN at any time during this period.

A full article describing this initiative will follow.

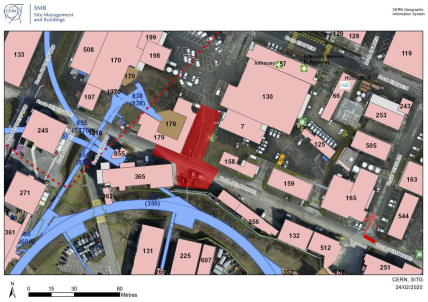


These roads on the Meyrin and Prévessin sites will be equipped with cycle lanes over the coming weeks

CLOSURE OF ROUTE DEMOCRITE

Due to roadworks, Route Democrite will be closed in front of buildings 158 and 179 from Tuesday, 25 February, at 8.00 a.m. until Tuesday, 30 June, at 5.00 p.m. This road closure may cause delays on circuit 1 of the shuttle service: the stop in front of building 855 will not be served.

Thank you for your understanding.



SMB Department

REGISTRATION FOR THE NEUTRINO 2020 CONFERENCE

The XXIX International Conference on Neutrino Physics and Astrophysics will be held on 22-27 June 2020 in Chicago, IL USA

The XXIX International Conference on Neutrino Physics and Astrophysics (Neutrino 2020) will be held on 22-27 June 2020 in Chicago, IL USA.

Discounted registration available with a hotel booking for the conference ends on Friday 28 February. Further information on registration, roommate finding, poster abstract submission, visas, financial support, and other details can be found on the conference website: https://conferences.fnal.gov/nu2020/.

Key dates:

- Feb 28: discounted registration with hotel booking ends
- Mar 15: financial assistance application deadline
- Apr 1: poster abstract deadline
- May 20: registration closes

HOW TO SIMULATE PARTICLE TRANSPORT WITH GEANT4

CERN will host training courses on the Geant4 toolkit for the simulation of particle transport in January and March 2020

CERN will host training courses on the Geant4 toolkit for the simulation of particle transport in January and March 2020. The courses will cover diverse aspects of detector simulation for experiments in High-Energy Physics or Nuclear physics, and diverse other applications.

The course “First Steps with Geant4”, held on 21-23 January 2020, will provide an overview of the capabilities of the Geant4 simulation toolkit, and its applications in HEP detectors and beyond. Its focus will be on how to create a simple Geant4 application from scratch. Each key capability will be explained and incorporated into the application, from creating a geometry and material of the setup to selecting between the available physics options.

Seats for this course will be available exclusively to those affiliated with CERN to register via the Learning Hub until 6 December. After this date, the remaining spots will be made available to anyone else.

A second course, “Geant4 Advanced Course”, for existing Geant4 users interested to improve their understanding and usage of Geant4 will be held on 24-26 March 2020. It will cover capabilities of Geant4 relevant for creating intermediate and advanced applications in any domain, with emphasis on topics most relevant to experiments in High-Energy or Nuclear Physics. Capabilities of Geant4 related to geometry description and optimisation, propagation of tracks in electromagnetic and other fields, the simulation of optical photons and exotic particles, and the use of speedup techniques including fast simulation and event biasing will be covered.

Registration for the Advanced course is already open and will be exclusive for those affiliated with CERN, until 1 February.

The courses are mainly targeted to experimental physicists involved in High-Energy Physics or Nuclear Physics experiments. They may also be of interest to those contemplating creating or extending applications in diverse fields from medical physics (medical imaging or particle therapy), or assessing the effects of the space radiation environment on satellites.

Please do not hesitate to contact Technical Training (technical.training@cern.ch) if you have further questions.

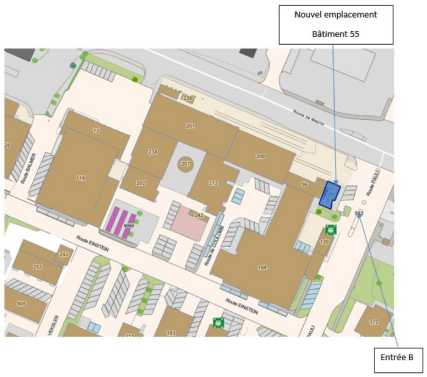
NEW ORGANISATION OF THE INSTALLATION SERVICE

New organisation of the Installation Service as of **Monday, 2 March 2020** :

- All requests must now be submitted in the first instance via the CERN Service Portal (*https://cern.service-now.com/service-portal/service-element.do?name=installation-relocation*)
- The Installation Service office will be located on the ground floor of Building 55, office 006
- A member of the team will be available at this location every day (except Wednesday) between 2.30 p.m. and 3.30 p.m. for the submission, signature and collection of documents only

Please also familiarise yourself with the useful information available here (*https://cern.service-now.com/service-portal/service-element.do?name=installation-relocation*).

Thank you for your cooperation.



NEW TIMETABLES FOR SHUTTLES 2 AND 5

The CERN shuttle services are constantly evolving to meet users' needs.
To ensure that the shuttles arrive on time despite traffic congestion on the Route de Meyrin in the mornings and the evenings, the timetables of shuttle circuits 2 and 5 will be changing as of Monday, 2 March 2020.

All details can be found on the SMB department's mobility webpage (*https://smb-dep.web.cern.ch/en/Mobility_Shuttle*).

Thank you for your understanding.

The Mobility Service
SMB-SIS

Ombud's corner

THE BENEFITS OF CONFIDENTIALITY

Yessica: "I am pregnant and wish to inform my hierarchy so they can get organised as early as possible, but I am wondering whether this could influence my chances of obtaining an indefinite contract. I would like to know if I can come and talk to you about this in complete confidence."*

Absolutely. As the Ombud, I am not part of the Management and I can advise Yessica completely independently. Delicate situations can be brought to my attention without anyone being placed at risk. In fact, I cannot take any action without the prior and explicit agreement of the people who come to see me. I will discuss the various options with Yessica, but it is entirely her choice what to do next.

Confidentiality is governed by a few principles:

- It doesn't just concern the content of the conversation, but also the very fact that we have met: no-one will know that you have come to see me.
- I don't generally take notes, but if I do, I destroy them as soon as the case has been dealt with. The only data that I keep is statistical, allowing me to write my annual report on systemic problems and trends.
- Under no circumstances will a conversation with me result in a formal procedure being triggered: I can never be called upon to testify in front of any board or committee. If you tell me about irregular situations, I cannot pass judgement or act on my own initiative. My role is to inform you of the potential consequences of the situation and explain what I think is the right thing to do. However, it's entirely up to you to decide what action to take.

Compare this with the professional secrecy of lawyers and doctors: if they compromise the confidentiality of their conversations, they risk losing the right to practice. The confidential nature of conversations with the Ombud is one of the main reasons why members of the personnel come to see me.

However, bear in mind that there is one exception: if I feel that there is a serious and imminent threat to people or the Organization. To be more specific, this means that if I learn that someone is in danger or that the Organization is under a serious threat (for example at risk of an attack or a major fraud that could undermine its financial situation), I must break

my pledge of confidentiality. However, I will inform the person concerned first.

You can come and see me in complete confidence.
A meeting with me can never be used against you.

**Names have been changed*

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 .