SERBIA JOINS CERN AS ITS 23RD MEMBER STATE

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“Investing in scientific research is important for the development of our economy and CERN is one of the most important scientific institutions today. I am immensely proud that Serbia has become a fully-fledged CERN Member State. This will bring new possibilities for our scientists and industry to work in cooperation with CERN and fellow CERN Member States,” said Ana Brnabić, Prime Minister of Serbia.

“Serbia has a longstanding relationship with CERN, with the continuous involvement of Serbian scientists in CERN's major experiments. I'm very happy to see that Serbia's initiative to seek membership status of CERN has now converged and that we can welcome Serbia as a Member State,” said Ursula Bassler, President of the CERN Council.

“It is a great pleasure to welcome Serbia as our 23rd Member State. The Serbian scientific community has made strong contributions to CERN's projects for many years.”

(Continued on page 2)
A WORD FROM MARTIN STEINACHER
BREXIT AND CERN

However, with the situation constantly evolving, the full impact on UK Members of Personnel and in particular their families is not yet clear.

The Host-State Relations Service, Legal Service and Human Resources Department have been working closely with the French and Swiss authorities to find solutions to issues as they arise, and will continue to do so as the situation evolves. A web page (https://hr-dep.web.cern.ch/content/brexit-and-cern) has been established by the Human Resources Department with links to general information, as well as to information provided by the governments of the UK, France and Switzerland.

For UK citizens resident in France, a particular focus of attention is the “Titre de Séjour Spécial” or “Carte de Séjour” for spouses and children, as well as the validity of driving licenses and the right to travel. For Switzerland, five bilateral agreements have been signed covering citizen’s rights, trade, insurance, road transport and air transport.

Information on the website (https://hr-dep.web.cern.ch/content/brexit-and-cern) will be updated regularly.

Martin Steinacher
Director for Finance and Human Resources

SERBIA JOINS CERN AS ITS 23RD MEMBER STATE

Membership will strengthen the long-standing relationship between CERN and Serbia, creating opportunities for increased collaboration in scientific research, training, education, innovation and knowledge-sharing, said Fabiola Gianotti, CERN Director-General.

“As a CERN Member State, Serbia is poised to further the development of science and education as our scientists, researchers, institutes and industry will be able to participate on the world stage in important scientific and technological decision-making,” said Mladen Šarčević, the Serbian Minister of Education, Science and Technological Development.

When Serbia was a part of Yugoslavia, which was one of the 12 founding Member States of CERN in 1954, Serbian physicists and engineers took part in some of CERN’s earliest projects, at the SC, PS and SPS facilities. In the 1980s and 1990s, physicists from Serbia worked on the DELPHI experiment at CERN’s LEP collider. In 2001, CERN and Serbia concluded an International Cooperation Agreement, leading to Serbia’s participation in the ATLAS and CMS experiments at the Large Hadron Collider, in the Worldwide LHC Computing Grid, as well as in the ACE and NA61 experiments. Serbia’s main involvement with CERN today is in the ATLAS and CMS experiments, in the ISOLDE facility, which carries out research ranging from nuclear physics to astrophysics, and on design studies for future particle colliders – FCC and CLIC – both of which are potentially new flagship projects at CERN.

As a CERN Member State, Serbia will have voting rights in the Council, CERN’s highest decision-making authority, and will contribute to the Organization’s budget. Membership will enhance the recruitment opportunities for Serbian nationals at CERN and for Serbian industry to bid for CERN contracts.

LS2 REPORT: EAST AREA VERSION 2.0

Not much more than the name will remain of the old East Area before too long. After LS2, the new PS experiment area will be a hub of technology

The major work to renovate the East Area of the Proton Synchrotron (PS), which began in 2018, will continue throughout LS2. This transformation of one of CERN’s oldest installations into a modern experiment area at the cutting edge of technology will take several years.
The civil engineering work, which mainly involves restoring the outer shell and roof of Building 157 (the East Area), should be completed within a few months. The building’s energy efficiency will be greatly improved, a prospect that won the SMB department and the project a major grant from the Office cantonal de l’énergie de Genève (OCEN).

But inside the building, the metamorphosis has only just begun. No fewer than 250 metres of beam lines supplying the CLOUD, CHARM and IRRAD experiments and the associated experiment areas must be renovated. “All the power converters, which use technology dating from the 1950s, will be replaced. The new converters, developed at CERN, will supply the magnets on a cyclical basis, with an energy recovery stage between each cycle. Electricity consumption should thereby fall from 11 GWh/year to around 0.6 GWh/year,” explains Sébastien Evrard, leader of the PS East Experiment Area renovation project. “As for the magnets, half of them will be renovated and the other half are currently being manufactured in several European countries.” Some 64 power converters and 60 magnets are concerned.

The beam lines will be arranged in a new configuration, with flexible optics, and new beam profile control monitors will be installed in order to carry out very precise measurements on the secondary beams. These scintillating fibre detectors have been developed at CERN by the Beam Instrumentation group to replace the less powerful delay wire chambers that were usually used in the past.

The renovation of the beam lines will begin in August with the installation of the new extraction line from the PS. By then, the experiment area will have been fully dismantled: more than 250 km of cables are yet to be extracted (50 km have already been removed), as well as 2000 tonnes of shielding blocks (of the 5000 tonnes present in the East Area).

This project, which is being steered by the EN/EA group, involves many other CERN groups from the EN, BE, TE, SMB, EP, HSE, IT, IPT and FAP departments, as well as external institutes, notably the University of Patras (Greece), the Joint Institute for Nuclear Research (JINR, Russia) and the Pakistan Atomic Energy Commission (PAEC). “Sincere thanks are due to all the teams for their tremendous commitment!” says Sébastien Evrard.

The recommissioning of the East Area is planned for the end of 2020, with physics scheduled to start again in spring 2021. This historic experiment area has served physics for more than half a century and, thanks to the modernisation work underway, will continue to do so for many more years to come.

For more information, see this article [https://home.cern/news/news/cern/complete-makeover-east-area], published in June 2018.

Anaïs Schaeffer

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**LHCB SEES A NEW FLAVOUR OF MATTER–ANTIMATTER ASYMMETRY**

The LHCb collaboration has observed a phenomenon known as CP violation in the decays of a particle known as a D0 meson for the first time.

The LHCb collaboration at CERN has, for the first time, the matter–antimatter asymmetry known as CP violation in a particle dubbed the D^0 meson. The finding, presented today at the annual Rencontres de Moriond conference and in a dedicated CERN seminar, is sure to make it into the textbooks of particle physics.

“The result is a milestone in the history of particle physics. Ever since the discovery of the D meson more than 40 years ago, particle physicists have suspected that CP violation also occurs in this system, but it was only now, using essentially the full data sample collected by the experiment, that the LHCb collaboration has finally been able to observe the effect,” said CERN Director for Research and Computing, Eckhard Elsen.

The term CP refers to the transformation that swaps a particle with the mirror image of its antiparticle. The weak interactions of the Standard Model of particle physics are known to induce a difference in the behaviour of some particles and of their CP counterparts, an asymmetry known as CP violation. The effect was first observed in the 1960s at Brookhaven Laboratory in the US in particles called neutral K mesons, which contain a “strange quark”, and, in 2001, experiments at the SLAC laboratory in the US and the KEK laboratory in Japan also observed the phenomenon in neutral B mesons, which contain a “bottom quark”. These findings led to the attribution of two Nobel prizes in physics, one in 1980 and another in 2008.

CP violation is an essential feature of our universe, necessary to induce the processes that, following the Big Bang, established the abundance of matter over antimatter that we observe in the present...
The size of CP violation observed so far in Standard Model interactions, however, is too small to account for the present-day matter–antimatter imbalance, suggesting the existence of additional as-yet-unknown sources of CP violation.

The $D^0$ meson is made of a charm quark and an up antiquark. So far, CP violation has only been observed in particles containing a strange or a bottom quark. These observations have confirmed the pattern of CP violation described in the Standard Model by the so-called Cabibbo-Kobayashi-Maskawa (CKM) mixing matrix, which characterises how quarks of different types transform into each other via weak interactions. The deep origin of the CKM matrix, and the quest for additional sources and manifestations of CP violation, are among the big open questions of particle physics. The discovery of CP violation in the $D^0$ meson is the first evidence of this asymmetry for the charm quark, adding new elements to the exploration of these questions.

To observe this CP asymmetry, the LHCb researchers used the full dataset delivered by the Large Hadron Collider (LHC) to the LHCb experiment between 2011 and 2018 to look for decays of the $D^0$ meson and its antiparticle, the anti-$D^0$, into either kaons or pions. "Looking for these two decay products in our unprecedented sample of $D^0$ particles gave us the required sensitivity to measure the tiny amount of CP violation expected for such decays. Measuring the extent of the violation then boiled down to counting the $D^0$ and anti-$D^0$ decays and taking the difference," explained Giovanni Passaleva, spokesperson for the LHCb collaboration.

The result has a statistical significance of 5.3 standard deviations, exceeding the threshold of 5 standard deviations used by particle physicists to claim a discovery. This measurement will stimulate renewed theoretical work to assess its impact on the CKM description of CP violation built into the Standard Model, and will open the window to the search for possible new sources of CP violation using charmed particles.

Follow the webcast of the CERN seminar at 11.00 a.m. Geneva time. For more information, see the LHCb website and the paper (https://cds.cern.ch/record/2668357) describing the results.

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THE SUBTERRANEAN BALLET OF ALICE

During the long shutdown of CERN’s accelerators, the ALICE experiment at the LHC is removing and refurbishing or replacing the majority of its detectors.

The experiment caverns of the Large Hadron Collider (LHC) are staging a dazzling performance during Long Shutdown 2 (LS2). The resplendent sub-detectors, released from their underground homes, are performing a fascinating ballet. At the end of February, ALICE removed the two trackers, the inner tracker system and the time projection chamber, from the detector. At the very start of the long shutdown, on 3 December 2018, the teams began disconnecting the dozens of sub-detectors. And finally, on 25 February, the two trackers were ready to be removed.

The trackers are located around the collision points and are used to reconstruct the tracks of the particles produced in the collisions. The data they generate are essential for identifying the particles and understanding what happened during the collision. ALICE’s inner tracker is a 1.5-metre-long tube, 1 metre in diameter. It will be replaced with a new, much more precise detector closer to the collision point, formed of seven pixel layers and containing a total of 12.5 billion pixels. The current detector is still in the cavern and could spend its retirement as a museum piece in an exhibition above ground.

The inner tracker system includes the tracking chambers, ALICE’s projection chamber, from the detector. Around 50 people are hard at work at the experiment.

At present, the removal process is continuing in the cavern. Most of the calorimeters have been removed for refurbishment. The trackers have been removed for refurbishment. Around 50 people are hard at work at the experiment.

To find out more about the major work in progress at ALICE, see these articles on the website (https://home.cern/news/news/experiments/upgrading-alice-whats-store-next-two-years) and in the CERN Courier (https://cerncourier.com/alice-revitalised/).

Watch the recording of the Facebook Live (https://www.youtube.com/watch?v=3cvtZoL4Zs) which took place in the ALICE cavern on 21 March.

See more images on CDS (https://cds.cern.ch/record/2665476).
In February 2019, the ALICE teams dismantled the two trackers of the experiment, including the internal tracker system (Image: Maximilien Brice/Julien Ordan / CERN)

After the removal of the two trackers, ALICE's heart is now empty. (Image: Julien Ordan/CERN)

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**ATLAS OBSERVES LIGHT SCATTERING OFF LIGHT**

The ATLAS Collaboration has reported the observation of light-by-light scattering with a significance beyond eight standard deviations

Light-by-light scattering is a very rare phenomenon in which two photons – particles of light – interact, producing another pair of photons. This process was among the earliest predictions of quantum electrodynamics (QED), the quantum theory of electromagnetism, and is forbidden by classical physics theories (such as Maxwell's theory of electrodynamics).

Direct evidence for light-by-light scattering at high energy had proven elusive for decades, until the Large Hadron Collider (LHC) began its second data-taking period (Run 2). Collisions of lead ions in the LHC provide a uniquely clean environment to study light-by-light scattering. Bunches of lead ions that are accelerated to very high energy are surrounded by an enormous flux of photons. When two lead ions pass close by each other at the centre of the ATLAS detector, but at a distance greater than twice the lead-ion radius, those photons can interact and scatter off one another without any further interaction between the lead ions, as the reach of the (much stronger) strong force is limited to the radius of a single proton. These interactions are known as ultra-peripheral collisions.

Yesterday, at the Rencontres de Moriond conference (La Thuile, Italy), the ATLAS collaboration reported the observation of light-by-light scattering with a significance of 8.2 standard deviations. The result uses data from the most recent heavy-ion run of the LHC, which took place in November 2018. This new measurement opens the door to further study of the light-by-light scattering process, which is not only interesting in itself as a manifestation of an extremely rare QED phenomenon, but may be sensitive to contributions from particles beyond the Standard Model. It paves the way for a new generation of searches for hypothetical light and neutral particles.

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Read more on the ATLAS website [https://atlas.cern/updates/physics-briefing/atlas-observes-light-scattering-light].

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**MOVING OUT OF ACADEMIA TO INDUSTRIAL ENGINEERING**

A round-table with CERN alumni focused on making the move from CERN to industry

More than 150 participants attended the third edition of the CERN Alumni “Moving out of Academia to...” series which took place on Friday, 8 February and focused on industrial engineering. The participants were given the opportunity to interact with the panellists (all CERN Alumni) from diverse sectors within industry, ranging from watch-making, airport security and numerical simulation amongst others.
COMPUTER SECURITY: DIGITAL BROKEN WINDOWS THEORY

Let's keep our Internet presence secure and professional! Let's apply New York City methods!

Have you ever heard about the “Broken Windows Theory”? It was introduced in 1982 by social scientists and suggests that serious crime and anti-social behaviour is more likely in environments where small crimes such as vandalism, public drinking and turnstile-jumping have already created an atmosphere of lawlessness. The city of New York adopted the theory, with the hope of reducing crime by creating a more positive urban environment, leading to order and lawfulness. We should try to apply the same theory to running computing services visible to the Internet.

Computing services at CERN are run by a large variety of people, but primarily by our colleagues from the IT department. On top of their service offerings, users can create web services with openings to the Internet. In parallel, our research community, the experiments and the accelerator sector independently run computing services, which themselves have openings to the Internet. While the Computer Security Team controls the openings in CERN’s outer perimeter firewall and performs an assessment on the level of security before any new opening is permitted, it is currently quite tiresome to maintain that security level for all open services. On the one hand, “computer security” is a highly dynamic subject and what was secure yesterday might become insecure tomorrow (think of the “Shellshocked” or “POODLE” vulnerabilities of the past). On the other hand, thanks to the motto “don’t touch a running system”, negligence leads to a deteriorated state of open services.

Recent computer security scans have shed some sinister light on those CERN computer services exposed to the Internet. Not all of them are perfectly secure anymore. Certificates have expired or are just “random” (e.g. self-signed or without chain-of-trust), encrypted channels use methods that are now deemed to be insecure, landing pages are missing or software is not up-to-date anymore. All owners of the affected services have, of course, been notified! But still, like in New York, deteriorated services might attract malicious evil-doers to carry out their malicious deeds. Let’s keep our Internet presence secure and professional! Let’s apply New York City methods! We already scan for vulnerable websites and outdated configurations, we already check whether current firewall openings are still needed and we notify the owners of affected services, but we need to do more! On the one hand, we should look into adapting the defaults for centrally managed services in order to have an elevated and more secure base configuration. On the other hand, we would like to ask all owners of computing services, in particular where running that service is not your primary occupation, to keep a closer eye on them. Don’t let them deteriorate! Keep them up-to-date and verify regularly that all versions are the most recent ones. Check your certificates and renew them in time. Have a landing page or, if not possible, redirect to “home.cern”. And, finally, review all firewall openings and ask us to close them if they are not needed anymore. Hence, for 2019 and beyond, let’s keep our Digital Broken Windows under control.

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
Official communications

TAXATION IN SWITZERLAND

Memorandum concerning the 2018 internal taxation certificate and the 2018 income tax declaration forms issued by the Swiss cantonal tax administrations

You are reminded that the Organization levies an internal tax on the financial and family benefits it pays to the members of the personnel (see Chapter V, Section 2 of the Staff Rules and Regulations) and that the members of the personnel are exempt from federal, cantonal and communal taxation on salaries and emoluments paid by CERN.

I - Annual internal taxation certificate for 2018

The annual certificate of internal taxation for 2018, issued by the Finance and Administrative processes Department, is available since 11 February 2019. It is intended exclusively for the tax authorities.

1. If you are currently a member of the CERN personnel you will receive 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: http://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 - 2018 income tax declaration forms issued by the Swiss cantonal tax administrations

The 2018 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

Announcements

40 YEARS OF PHYSICS IN THE NORTH AREA

CERN will host a scientific symposium to celebrate 40 years of physics with the SPS

Fixed-target experiments have a long history at CERN, forming essential building blocks in the physics landscape, in parallel to collider facilities. For 40 years, the Super Proton Synchrotron (SPS) has provided a steady stream of high-energy proton beams to the North Area at the Prévessin site, feeding a wide variety of experiments. A symposium will be held at CERN to celebrate this hub of experiments, which have been exploring many fundamental questions and will continue to enrich the programme of the Laboratory.

North Area 40th anniversary celebration
Wednesday 3 April, 2.00 pm
Main Auditorium

Information and registration here (https://indico.cern.ch/e/NA_40years).
DISCUSSION WITH THE CERN DIRECTORATE

CERN’s Directorate answered your questions on 19 March

The second edition of the open discussion between CERN staff and the Directorate took place on 19 March. For those who were unable to follow the event, the recording is available here (https://indico.cern.ch/event/793416/).

Below is a list of the fifteen questions that received the most votes, the first three of which were dealt with during the session.

The topics that you consider important and that could not be discussed during the session will be addressed by internal communication in the coming months.

There were a total of 1479 voters. Find below the three questions that received the most votes:

Questions % of total votes

How is CERN’s infrastructure coping with the increase in the number of people on site and in particular in the restaurants? 61
What is the strategy for sustaining CERN’s funding to fulfil its mission? 59
How does CERN compare FCC and CLIC to China’s CEPC? 57

Here are the following twelve questions in terms of number of votes:

Questions % of total votes

How can CERN mitigate daily traffic jams at the border? 46
Could CERN review the staff LD and IC model, in terms of costs and knowledge retention? 42
What is planned for the maintenance of old buildings and the optimisation of safety? 42
How is CERN tackling the administrative burden versus time to work on science? 40
How does CERN justify the increasing atmosphere of access control, policing and restrictions on social areas such as the BBQ site? 39
How could CERN enhance career evolution and sustain motivation? 38
Is CERN considering measures to adapt workload to available resources? 36
How does scientific governance evolve with the increasing number of Member, Associate Member and non-Member States? 31
Visible wearing of access cards on-site is not really enforced, is that an issue? 30
Could CERN offer multi-storey parking? 29
How is CERN improving IT tools and optimising services as a cutting-edge technology organisation? 28
How is CERN addressing the difference in CERN personnel statuses and the associated conditions? 28

Feel free to give us your opinion on the session by email so the Directorate can take this onboard for the future.

ON-DEMAND TRANSPORT IN THE PAYS DE GEX: NEW STOP AT PORTE DE FRANCE

The express line of the on-demand transport services in the Pays de Gex will include an additional stop in front of the Porte de France from Monday, 1 April 2019.

You can check the timetable and map above.

More information on the Pays de Gex Agglo

This line, operating between Léaz and CERN’s Meyrin site, is available by reservation since September 2018.

(Image: Pays de Gex Agglo)
A NEW HEAD FOR OUR MEDICAL SERVICE: JOHN WIJNBERG

A new head of the CERN Medical Service took office on 1 February. John Wijnberg took over from Véronique Fasnacht, who retired at the end of January.

Read more on CERN HSE's website (https://hse.cern/news-article/new-head-cern-medical-service).

BLOOD DONATION - 3 APRIL - RESTAURANT N°2

BLOOD DONATION

on 3rd of April 2019
from 8.30 to 15.30 - CERN Restaurant n°2 (Bldk. 504)

FINDING HAPPINESS IN PATENT INFORMATION DATABASES

CERN's Knowledge Transfer Group will be running the one day training session "Finding Happiness in Patent Information Databases" on 7 May 2019 at the CERN Training Centre. Learn about the anatomy of patents and patent information databases and why it matters.

Description of the course:

• Brief introduction to knowledge transfer at CERN
• Fundamentals of intellectual property and patents
• Anatomy of a patent vs scientific publication
• Patent classification

• Introduction to publicly accessible patent information databases
• Searching public access patent information databases (Espacenet and Google Patents)
• Data analysis on patent information

If you are interested contact:
Technical.management.training@cern.ch
or sign up directly in the CERN Training Catalogue: http://tinyurl.com/y647673x

This course is aimed at CERN personnel, but is also open to Users and Alumni.
DIALOGUE SABOTEURS AND HOW TO OUTFOX THEM

Manuel* has been ill at ease with his supervisor Robert* for several months, but is having difficulty instigating a calm and constructive conversation about it. "Every time I try to start a discussion, I get flustered and feel like he's manipulating me. I feel powerless; he always gets the better of me."

Robert may, consciously or unconsciously, be using tactics to sabotage the dialogue, due to a lack of confidence, disinterest... or just having other priorities, who knows?

People can sabotage dialogue in several ways:

- Putting the person down: “Anyway, you’ll never be a good engineer. I sometimes wonder where on earth you got your degree.”
- Getting lost in details: launching into a long monologue during which Robert mentions all of Manuel's failings, starting by setting out all the reasons why he hesitated to recruit him, etc.
- Staying on a purely rational level: “If you have too much work, draw up a schedule including your priorities and precise deadlines.”
- Slipping into emotive language: “Whatever I do, you're never satisfied and you always complain – it’s unbearable!”
- Launching into generalities: “Whatever happens, we always have to do things differently here at CERN.”

When you are faced with someone acting in bad faith like Robert, what can you do?

- Even before requesting a meeting, decide for yourself exactly what you expect to gain from the conversation: more resources, more attention, or just to make him understand your situation? Prepare a few key questions to which you absolutely must get answers and don’t leave until you have them. Even if the reaction isn’t exactly what you wanted, it’s better to get a negative response than a vague one.
- Know how to recognise the tactics for sabotaging dialogue and don’t fall for them: “Robert, I hear what you’re saying to me and I’m more than happy to talk about it another time, but now I want to come back to the subject of our conversation.”
- Focus the discussion on the situation, not on the person: “This isn’t a personal conflict between us, my problem is that...”
- Don’t accuse (“You never have time for me”), but put your expectations into words (“I need to be able to explain my problem to you”).

If, despite all your efforts, you still feel you have a fight on your hands, ask for help from a neutral third party, such as the Ombud, to help facilitate the dialogue.

*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.