

## CERN 60: CELEBRATING WITH THE UN

A special event to celebrate CERN's anniversary will be held Monday 20 October at the United Nations Headquarters in New York, US. High-profile speakers from the world of politics, diplomacy and science will celebrate their common values: inclusion, peaceful co-operation and universality.



CERN's relations with intergovernmental organisations are part of CERN's engagement with key stakeholders, which include, among others, the Member States, the scientific community, and the Host States. In recent years, the Laboratory has grown from European to global and it is actively engaged in several collaborations with other intergovernmental organisations, including the UN and some of its agencies (UNESCO, UNITAR, WHO, WIPO, WMO, etc.). "It seemed natural for us to organise an event to celebrate CERN's 60th anniversary with this international community," explains Maurizio Bona, advisor to the Director-General in charge of relations with international organisations. "However, making such an event happen is not a given: if on one side it is extraordinary that CERN has been given the opportunity to celebrate at and with the United Nations, on the other side this means that our Organization, so used to another type of conferences and workshops, has to learn

how to navigate in these relatively new waters by adhering to the explicit and tacit rules that define the multilateral relations community."

The event, held in the Economic and Social Council Chamber, will bring together eminent representatives of the world of science and international affairs, to offer a broad testimony, from the scientific and political angles, of the role that science has played in building international collaborations, uniting people and cultures. "We carefully tried to balance the interventions between our Organization and the world of politics in order to give each sector the same relevance," says Bona. "Our hope is that this event will trigger a more effective dialogue between scientists and policy makers and will produce concrete ideas of how to include science when it comes to decisions that influence our future and that of our planet."

(Continued on page 3)



### ICTP CELEBRATES 50 YEARS

CERN is not the only scientific organisation to be celebrating a significant anniversary in 2014. Earlier this year, ESA turned 50, and last week it was the turn of the Abdus Salam International Centre for Theoretical Physics, ICTP, to blow out its 50 candles. I had the pleasure to be there for the occasion, and to take part in the first day of a four-day scientific celebration in which the true value of ICTP came to the fore.

(Continued on page 2)

## In this issue

### NEWS

CERN 60: celebrating with the UN	1
ICTP celebrates 50 years	1
LS1 Report: it's a hard knock life for Ops	2
Experimental music for experimental physics	3
CERN's 60th anniversary celebrations: "Cook"ed to perfection	4
Happy Birthday TREF!	4
Is it a bird? Is it a plane?	5
No, it's a tow truck!	5
Thomas Kibble visits CERN	5
Five schools visit CERN and IceCube virtually	6
Mystery photos from CERN's history	6
A quantum physics poetry competition	7
Behind the scenes of GS	8
Computer Security	8
Emilio Picasso (1927-2014)	9
Official news	10
Seminars	12

Published by:

CERN-1211 Geneva 23, Switzerland

Tel. + 41 22 767 35 86 Printed by: CERN Printshop

© 2014 CERN - ISSN: Printed version: 2077-950X

Electronic version: 2077-9518

ICTP CELEBRATES 50 YEARS

Nobel Prize winning Pakistani physicist Abdus Salam established the ICTP in 1964, and went on to become its first director. The Centre’s mission was and remains to foster the development of international scientific cooperation and to promote scientific excellence with an emphasis on the developing world. Established outside Trieste, Italy, and operated under a tripartite agreement between the Italian government, the IAEA and UNESCO, the ICTP has proven itself true to that mandate and become a driving force for advancing scientific expertise around the globe.

ICTP alumni populate many walks of life, from research positions at major universities to policy roles in government, all of them striving to implement the ICTP’s ideals. Many of them were present for the celebration last week, which impressed as much through the diversity of the people celebrating the Centre as for the reminders of its scientific achievements.

All areas of science were represented, with Nobel Prize winners and former CERN Directors-General among the speakers, as well as upcoming scientists from further afield such as Marcia Barbosa, who recently spoke so compellingly at TEDxCERN. But perhaps

the most telling tribute to the ICTP’s success in fulfilling its mission came from people like Ansar Parvez, Chair of Pakistan’s Atomic Energy Commission, and policy-oriented participants, such as Paul Kagame, President of Rwanda, and Prince El Hassan bin Talal of Jordan, all of whom spoke on the opening morning about the importance of science to their countries. Because science is ubiquitous, it is the future for all of us, and cannot be simply the preserve of the developed world. That is what makes the ICTP such an important part of the global scientific landscape.

Rolf Heuer

LS1 REPORT: IT’S A HARD KNOCK LIFE FOR OPS

Whether they’re restarting the accelerator or sending beam to North Area experiments, the SPS Operations team has been hard at work this month returning the machine to operation. Their work is more than just a flip of a switch - rather, operating it is more akin to completing a cryptic crossword...

Instead of your typical re-start, kicking off the SPS was rather like commissioning a new accelerator. From re-cabling campaigns above and below ground to last-minute magnet replacements and alignments, plenty is new in the SPS. “Commissioning a machine from scratch is rather like sitting in front of an empty crossword” explains Karel Cornelis, responsible for SPS operations. “At the beginning there is little to rely on. You may have an answer - or rather, a reading - but you can’t be sure it is correct. Then, as more and more “words” are filled in, you can start to rely on your earlier answers. We get our answers from equipment, instrumentation and controls. To progress, we need to convince ourselves that the reading is right and can be relied on.” But what happens when all of the equipment

you usually rely upon has been changed? “Usually, when we restart a machine, we can rely on readings from a part which has not been altered,” says Karel. “But in the SPS, almost everything was changed so we were starting from scratch.” Are the erroneous readings caused by the beam? The software? The magnets? Working out which is a delicate balancing act.

One of the main refurbishments affecting this balancing act was the addition of new function generators. By controlling the functions of SPS pulsing equipment (magnets, RF cavities), these generators are essential tools for the operation within the accelerator complex. Among their many benefits, the generators allow the SPS to be put in “coast”, keeping the energy constant.

They also feature an “economy mode”: the magnets stop pulsing when there is no beam, thus saving energy (and money!). The new beam lines in the North Area also proved complex to calibrate. With work on-going until just 2 weeks ago, there was little time to commission the lines with beam.

“The main issues we found throughout the whole commissioning were installation errors: swapped or missing cables, sign bugs in the software, etc.” explains Karel. These are human errors with a human solution: check, double-check and check again!

Katarina Anthony

Meanwhile, elsewhere...

Great news! The last remaining sector (3-4) started its cool-down on Tuesday 14 October. Meanwhile, sector 8-1 completed its cool-down and now has ELQA testing ongoing with powering tests scheduled for two weeks time. In sector 5-6, CSCM tests are being carried out and, in sector 6-7, powering tests are ongoing.

The count so far? Two sectors of the machine have reached final cryogenic operating conditions.

(Continued from page 1)

(Continued from page 1)

Another challenge in uniting these worlds is to find the subtle line between advocating for a more relevant role for science in the global sphere and the full respect of the point of view of each and every speaker, whether he or she belongs to the scientific or political community. This concept might sound abstract but it translates into very concrete actions: preparing

briefing documents to articulate CERN’s vision in the field of multi-lateral relations and sharing, with transparency and honesty, CERN’s desired outcomes from the event.

Above all, this delicate exchange of information requires trust. This is built over time and by working together openly on

projects and initiatives that cement reciprocal understanding and the collaborative spirit.

Follow the live webcast of the event on [webtv.un.org](http://webtv.un.org).

CERN Bulletin

EXPERIMENTAL MUSIC FOR EXPERIMENTAL PHYSICS

Using the sonification technique, physicist and composer Domenico Vicinanza paid homage to CERN at its 60th anniversary ceremony. After months of hard work, he turned the CERN Convention and LHC data into music.



Every birthday deserves gifts and CERN’s 60th anniversary was no exception. Two gifts were very special, thanks to the hard work of Domenico Vicinanza, a physicist and composer. He created two experimental pieces by applying the sonification technique to the CERN Convention and to data recorded by the four LHC detectors during Run 1. “This technique allows us to ‘hear’ data using an algorithm that translates numbers or letters into notes. It keeps the same information enclosed in a graph or a document, but has a more aesthetic exposition,” explains Domenico Vicinanza. “The result is meant to be a metaphor for scientific cooperation, in which different ‘voices’ and perspectives could reach the same goal only by ‘playing’ together.”

Each source of data could be sonified in many ways, which is where the genius of the composer comes in: “I chose how to

map the data to musical parameters since, as with any composition, I had to make decisions concerning the choice of the scale, the instruments, which instruments play when, timbre, tempo, etc.,” says Vicinanza. “I created different melodic lines but the magic happened when all the instruments played together. The same applies to scientific research, where support and cooperation allow great results to be achieved.”

The Convention has more than 28,000 characters, and each one was translated into a note: same letter, same note. The algorithm didn’t do all the work; the human element of the creative process was essential: “It took me more than 250 hours to sonify the Convention, but I really wanted to celebrate what it really means: peace beyond any political disagreement, for the common purpose of scientific research,” explains the composer. During the 60th anniversary ceremony, the European Union Youth Orchestra directed by Maestro Vladimir Ashkenazy, played Domenico Vicinanza’s sonified Convention, so he had to write the score for each instrument. “The orchestra kindly accepted to extend their membership, which originally represented the 28 EU Member States, to 42 young players covering all of CERN’s Member States and Observers in order to convey the message of harmony and peace that they share with our

Organization” says Paola Catapano of CERN’s Communications Group, co-producer, with Vicinanza, of the EUYO performance.

For the LHChamber music, seven instruments were recorded in the four experimental caverns and in the CERN Control Centre. “Scientists played the music from the data they had worked on in the places where they actually worked,” explains Vicinanza. “Every instrument had its own sense, like the research they did, but only when they’re played together do you feel the harmony in it: it’s like the whole goes beyond the sum of the parts. Writing the scores out of these data made me feel like the musical alter ego of a researcher.”

The LHChamber Music score is downloadable here: <https://cds.cern.ch/record/1950682/files/CERN60thpreconcert.pdf>

Use the QR code to download the mp3 recording of the European Union Youth Orchestra.



Rosaria Marraffino

Did you know?

“If the Large Hadron Collider made music, what would it sound like?” read the title of an article in The Guardian on 30 September featuring the “LHChamber Music” video. This was just one of 36 online media sources across the world, including the UK, China, India, the US, Italy, France, Canada and even Palestine, that reported on CERN’s YouTube video between September 29 and October 4, reaching a combined readership of more than 198 million people! With hits on the YouTube video growing from 9000 to over 20,000 views in under 24 hours and reaching over 50,000 in one week, the video is definitely CERN’s most successful in 2014 and among the top ten ever published on the CERN YouTube channel. “LHChamber Music” went viral on Twitter too: the phrase “CERN music” was tweeted 1147 times in nine days by 1039 contributors, including unexpected CERN supporters such as the UK’s Royal Philharmonic Society!



# CERN'S 60TH ANNIVERSARY CELEBRATIONS: "COOK"ED TO PERFECTION

On 29 September, CERN celebrated its 60th anniversary with a gala celebration. Hundreds of CERN staff members and users, dignitaries from CERN Member States and representatives of international organisations filled the marquee for a ceremony featuring speeches as well as music from the EU Youth Orchestra. CERN Recruitment Unit section leader Anna Cook was called in at the last minute to host the ceremony.



Anna had just got back from a run on her day off when she got the call. On the line CERN60 project leader Sascha Schmeling, Globe manager Bernard Pellequer and video editor Jacques Fichet had a problem. French-Swiss journalist Darius Rochebin, who had been pegged to host CERN's 60th anniversary ceremony, had been forced to cancel at the last minute, just three days before the event.

Would Anna host the celebration – a ceremony to be attended by hundreds and broadcast around the world for all to see? After asking whether it

was a joke, she said: "OK, I'm on my way". So Anna suddenly became the master of ceremonies: she would introduce the speakers (dignitaries from CERN Member States), the explanatory videos and the entertainment, making her the public face of CERN on its birthday. This wasn't Anna's first time presenting – she presented the *What's New @CERN* videos a few years ago – but it was certainly the first of its kind. "We had just two dress rehearsals – one on Sunday and one on Monday morning," Cook explains. "I was so scared of going wrong – of mispronouncing a dignitary's name or omitting part of the script. But it was an adrenaline rush!"

The whole 60th anniversary team played a part in helping Anna to succeed. Scripting the ceremony was a group effort involving members of the Communication Group, the Protocol Office and, of course, the Director-General. Anna had support on the day from Eva Tolosa, who cued her entrances through a hidden earpiece, and two discrete prompters that helped her to remember the script when she was on stage.

Anna presented with friendly professionalism – a picture of controlled calm despite last-minute changes, such as one national minister deciding just two hours before the ceremony not to speak. "Knowing I had friends and colleagues in the room, and that if I tripped up they wouldn't hold it against me, really helped me to get rid of the nerves," says Cook. "Afterwards I felt elated, really happy, because I'm really passionate – we all are – about this Organization, and that's why I said yes to presenting."

A final surprise was the chance to meet maestro Vladimir Ashkenazy, who conducted the EU Youth Orchestra at the end of the ceremony. "I grew up with his music," said Cook. "My parents had Ashkenazy CDs and would play classical music every Sunday morning."

The day after the ceremony, Anna was back to her day-to-day work in the Human Resources Department. Ready for the next call?

*CERN Bulletin*

## HAPPY BIRTHDAY TREF!

Last month marked the 20th anniversary of TREF, CERN's Tripartite Employment Conditions Forum, which held its first meeting on 27 September 1994. TREF was established to provide a forum in which the Management, Council delegations and the staff would be able to have their say on employment conditions at CERN. Its mandate remains "to oversee the collection of information [about employment conditions at other employers] and to stimulate communication and discussion between representatives of the Member States, the CERN Management and the CERN Staff Association".

TREF was preceded by a series of bodies, the first of which was established as far back as 1979, the year in which the concept of a five-yearly review of employment conditions was first introduced at CERN. Fifteen years later, the establishment of TREF marked a coming of age. TREF brought a new methodology to data collection activities, systematically looking at the employers that are CERN's real competitors in terms of recruitment and taking into account the conditions in the Geneva region. In short, TREF brought a scientific approach to the task: appropriate for a scientific organisation. Since that first meeting, TREF has met a further 86 times, contributing greatly to achieving mutual understanding between the three parties involved and providing invaluable

information to the full Council to inform the decision-making process.

It didn't take TREF long to become established and fulfil its remit. By December 1995, TREF had already agreed on a package of employment conditions and submitted it to the Council at its 103rd session, where it was approved by a majority vote. To this day, TREF has continued to work hard to reach a consensus and to provide the Council with information obtained through the scrupulous analysis of data.

TREF was established as a forum to foster mutual understanding between the three parties involved. In this, it has been a resounding

success. You only have to look at the positive working relationships between the general staff population, the Management and the Council for evidence. It is a fact that of the 35 international organisations surveyed by the International Labour Organization, CERN enjoys the best labour relations and the lowest number of disputes. This shows that TREF works and saves the Laboratory time and money, and it's something that all those who put so much effort into TREF can be justly proud of.

*Abridged from a speech delivered on behalf of the Director-General by Sigurd Lettow on the occasion of the 87th meeting of TREF on 9 October 2014.*

# IS IT A BIRD? IS IT A PLANE? NO, IT'S A TOW TRUCK!

CERN has equipped itself with a tow truck to fight back against dangerous parking habits. The Security service will use the truck to rid the site of abandoned cars, which take up so many parking spaces, as well as badly parked cars, which are often a danger to other road users.



Breaches of parking etiquette that endanger other vehicles and pedestrians include cars parked in such a way as to impede visibility, for example, at junctions and roundabouts, or cars

parked in parking spaces for the disabled or in areas reserved for emergency vehicles. Various measures will be taken to tackle the problem: for less serious offences, a sticker will be put on the windshield of the vehicle and an e-mail sent asking the driver to park in an authorised space. For more serious offences, the vehicle will be immobilised with a wheel clamp, or even removed by the tow truck and taken to a dedicated car park on the Meyrin or the Prévessin site. "No fines will be issued," explains Didier Constant, Head of the Security service, "but it will only be possible to get the vehicle back following the approval of the supervisor of the person concerned."

The fight against drivers who break the highway code on the CERN site will soon get reinforcements in the form of a speed measurement campaign. "The goal of this campaign is to collect reliable statistics on the behaviour of users, compare the findings from different parts of CERN with the map of recorded accidents, and set out a policy on the matter," explains Didier Constant.

The mobile speed camera started collecting data on 10 October.

*Antonella Del Rosso*

## THOMAS KIBBLE VISITS CERN

Emeritus Professor Sir Thomas W.B. Kibble, from Imperial College London visited LHC for the first time last week and delivered a colloquium on the genesis of electroweak unification and the Brout-Englert-Higgs mechanism.



From left to right: Jim Virdee, Tiziano Camporesi, Tom Kibble and Austin Ball on the visit to CMS.

On his way back from Trieste, where he received the Abdus Salam International Centre for Theoretical Physics' Dirac Medal, Tom Kibble stopped by CERN for his first visit to the LHC. Kibble had a standing invitation from Jim Virdee, former CMS spokesperson, who is also a researcher from Imperial College London.

Kibble made the trip to CERN a family outing and brought along 14 relatives, including his

children and grandchildren. He visited the ATLAS detector with Peter Jenni, its former spokesperson, on Friday 10 October.

In the afternoon, Kibble delivered a colloquium in the CERN Council Chamber in which he gave a historical account of the genesis of Electroweak Unification and the Brout-Englert-Higgs (BEH) mechanism, from his perspective at Imperial College. He explored the research



Peter Jenni (left) and Tom Kibble tour the ATLAS detector. (Image: Erwan Bertrand)

from the 50s and 60s that lead to electroweak interaction theory and the BEH mechanism.

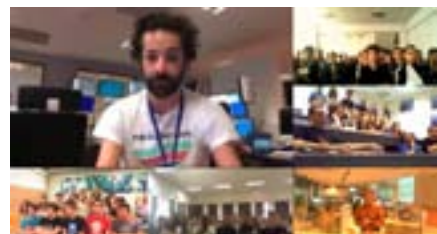
On Saturday morning he and his family visited CMS with Jim Virdee, Tiziano Camporesi, the current CMS spokesperson, and Austin Ball, the current Technical Coordinator, before returning to England.

*Rosaria Marraffino*



# FIVE SCHOOLS VISIT CERN AND ICECUBE VIRTUALLY

The ATLAS and CMS experiments hosted a virtual visit together with the IceCube Experiment in the South Pole for students from five different European schools on 2 October. The visit allowed the students to interact with researchers from both the LHC experiments and the IceCube experiment. The virtual visit was the second event in the Open Discovery Space project's "Bringing Frontier Science to Schools" series.



The 380 students and 14 teachers and education specialists who took part in the virtual visit were from the John Atanasoff Sofia Vocational High School of Electronics in Bulgaria, Ellinogermaniki Agogi school in Greece, Leo Baeck High School in Israel, Grigore Moisil National College in Romania and Svetozar Marković Grammar School in Serbia.

"It was breathtaking and a great opportunity to have our questions answered by the researchers, also live via chat," said Marco Ilic, a student from Serbia.

The hosts at CERN – Angelos Alexopoulos,

Andromachi Tsiros, Zoltan Zsillasi, Noemi Beni and Steven Goldfarb – connected from three different locations: the ATLAS and CMS Control Rooms and the CMS cavern. The hosts from IceCube – Ian Rees and Dag Larsen – connected from the Amundsen Scott South Pole Station in the neutrino observatory lab. Jim Madsen and Megan Madsen also of IceCube connected from the University of Wisconsin-Madison in the US.

"I really enjoyed hearing about the everyday life of a researcher at the South Pole. It was so cool to talk with students and scientists from all over the world," said Guy Schwarz, a student from Israel.

The visit, which was divided into two parts featuring presentations from CERN and IceCube, also gave the students and teachers an opportunity to interact and encourage each other's interest in science.

"It's great to work with our colleagues at CERN to show students two different cutting-edge detectors, each with a different approach

to exploring the universe," said Jim Madsen, Associate Director for Education and Outreach at the Wisconsin IceCube Particle Astrophysics Centre.

Open Discovery Space brings millions of educational resources directly into school classrooms and empowers teachers to build their schools' digital libraries, join communities of peers to share best practices, and connect their schools virtually with the world's best research centres, museums and libraries.

Use the QR code below to watch the virtual visit:



Abha Eli Phoboo

## MYSTERY PHOTOS FROM CERN'S HISTORY

Over the first 50 years of its existence, before digital photography became the norm, CERN accumulated about a quarter of a million hard-copy images in its archive. Now, a project is underway to digitise the entire collection and make it searchable via the CERN Document Server (CDS).

Some 120,000 black and white images from the period 1955-1985 are currently being digitised, with files being uploaded in batches of several hundred per week. They are then automatically sorted into albums based on the existing information.

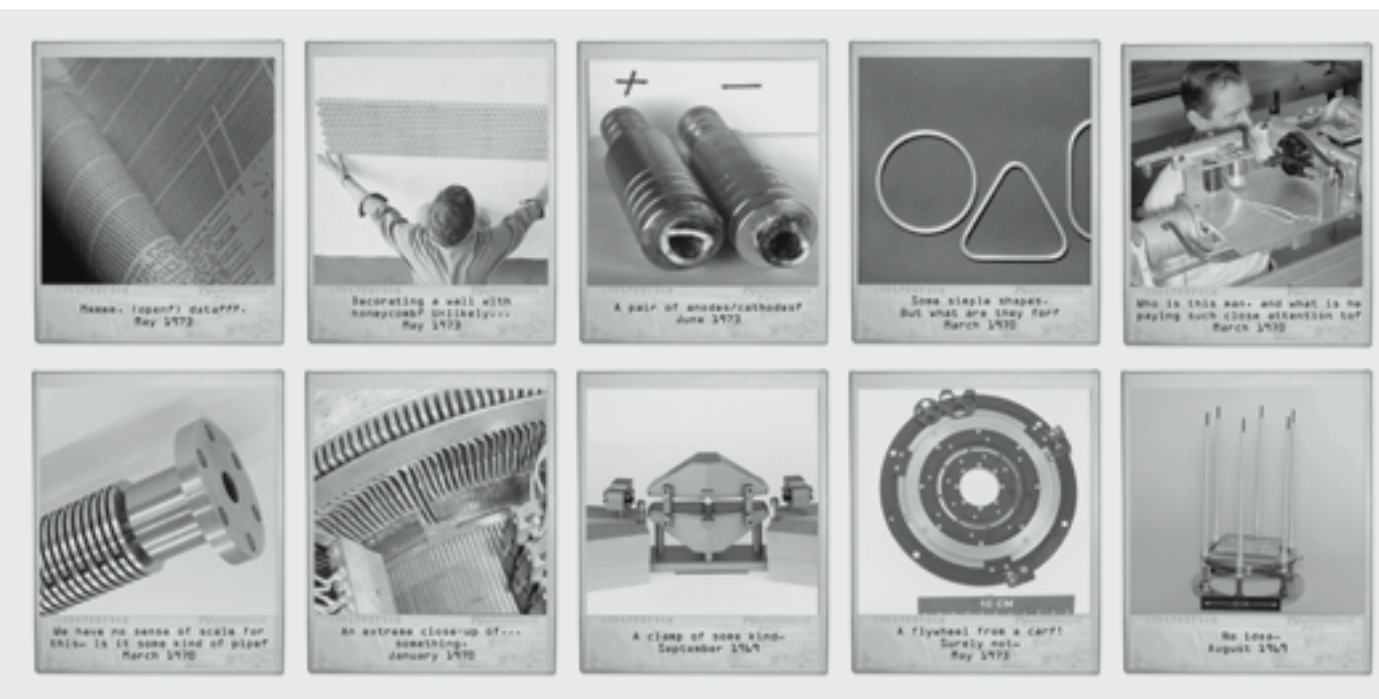
In most cases, at least some descriptions exist, allowing us to identify the pictures.

However, many albums are still in need of titles, the names of the people in the photos, descriptions of equipment, etc., and we

believe that much of this information could be crowd-sourced from the CERN community. Here are some highlights from the first few thousand uploads, some of which we do have information about:



But what about these pictures? Here we have far less information – what could they be?



Please get in touch by e-mail ([photo.archive@cern.ch](mailto:photo.archive@cern.ch)) if you have any information about the pictures.

We will be offering many more challenges in future issues of the Bulletin. Thank you in advance for helping to complete the records.

This digitisation project is a collaboration between the Collaboration and Information Services Group (IT-CIS) and the Scientific Information Service (GS-SIS).

Jens Vigen, Alex Brown

## A QUANTUM PHYSICS POETRY COMPETITION

What do you think happened when six world-renowned poets from six European countries met eight famous CERN scientists to talk about the Universe and the Higgs boson? Six poems about new quantum physics discoveries were born from this exciting collision of literature and science in an intimate and spontaneous setting!



Express yourself through poetry: this is the call from POPScience, a European Researchers' Night 2014-15 project supported by CERN. The general public can discover the mysteries of particle physics using a series of texts and

thematic videos as well as clips of the meetings of the poets and CERN scientists available on the POPScience website.

The Big Bang, an expanding Universe, dark energy, matter, antimatter and supersymmetry: what are they and do they exist? The general public is welcome to give an answer in a poem by signing up to the competition. Poems can be submitted in English, French, Italian, Danish and Spanish; the selected entries will be translated and published in all five languages alongside the work of the poets taking part in the project.

You need to have an app that can read QR-codes to download the poems, such as e-pub or i-book. Otherwise, you can find the e-books as well as the competition rules and plenty of other information on the project online:

[www.subway-letteratura.org](http://www.subway-letteratura.org)  
[www.pop-science.eu](http://www.pop-science.eu)

Please note: the deadline for submitting poems is 30 October 2014.

Susanna Wong



## SHARED MOBILITY

**The GS-IS team responsible for mobility is working on the problematic equation of improving transport with a growing number of people on site.**

Congested car parks and sites that are far apart mean that going from one place to another at CERN often requires patience. Transport is major a concern not only for people working at the Organization, but also those in charge of the road infrastructure. The 120-hectare Meyrin site and the distance between the various sites mean that efficient modes of transport are essential. The growing number of people on site and the increasingly congested car parks have made the problem even trickier. Over the past five years, the GS-IS group has launched several initiatives to facilitate mobility on site without proportionately increasing CERN's fleet of vehicles. Sharing is the only solution!

The shuttle service has been reinforced: since 2010, four regular routes have been set up as well as a service for operators working shifts during the LHC run. Last year alone, the shuttles transported 100,000 passengers.

The car-sharing service, in place since December 2011, is another such innovation. Once you have signed up to the Car Pool and Rental service

(Building 130) and booked a car online, you can use one of the 35 available vehicles at one of the 16 pick-up points on the Meyrin and Prévessin sites as well as at Points 2 and 5. Now in its third year, CERN car-sharing has been a growing success with more than 15,000 bookings in 2013.

This initiative also aims to reduce CERN's fleet of vehicles. Some 800 cars are in service and 150 extra vehicles were added for the long technical shutdown, LS1. The use of CERN vehicles, which are, on average, driven infrequently, is not optimal. "We have launched a study with the various departments to evaluate their needs and how much they use the vehicles," explains Véronique Sogno, Deputy Head of the GS-IS group and responsible for transport and mobility. "Our goal is to maintain the same level of service while reducing the fleet by 12%." The idea, therefore, is to share vehicles in order to free up parking spaces and reduce operating costs and the carbon footprint.

The GS-IS group has started a global rethink on mobility at CERN. "The goal would be to develop a long term mobility plan to improve transport sustainably," states Jurgen de Jonghe, Head of GS-IS group. Transport and mobility matters go beyond the boundaries of the Laboratory. The group has recently forwarded CERN personnel and users a survey from the Republic and Canton of Geneva that investigates the daily commute of the staff of international organisations. The results of the survey will contribute to the establishment of transport policy in the region.

Our old transport habits are at the heart of the problem. We're the first to use our own car when we could car-share or use public transport. So, next time you need to go somewhere at CERN, do a bit of research, there could be a shuttle or a car-sharing station a stone's throw from your office. Have a look at the GS department's transport and mobility page: [gs-dep.web.cern.ch/en/concert/mobility](https://gs-dep.web.cern.ch/en/concert/mobility).

Corinne Pralavorio

## Computer Security

## OUR LIFE IN SYMBIOSIS\*

**Do you recall our Bulletin articles on control system cyber-security ("Hacking control systems, switching lights off!" and "Hacking control systems, switching... accelerators off?") from early 2013? Let me shed some light on this issue from a completely different perspective.**

I was raised in Europe during the 80s. With all the conveniences of a modern city, my environment made me a cyborg - a human entangled with technology - supported but also dependent on software and hardware. Since my childhood, I have eaten food packaged by machines and shipped through a sophisticated network of ships and lorries, keeping it fresh or frozen until it arrives in supermarkets. I heat my house with the magic of nuclear energy provided to me via a complicated electrical network. In fact, many of the amenities and gadgets I use are based on electricity and I just need to tap a power

socket. When on vacation, I travel by taxi, train and airplane. And I enjoy the beautiful weather outside thanks to the air conditioning system located in the basement of the CERN IT building.

This air conditioning system, a process control system (PCS), monitors the ambient room temperature through a distributed network of sensors. A smart central unit - the Programmable Logic Controller (PLC) - compares the measured temperature values with a set of thresholds and subsequently calculates a new setting for heating or cooling. On top of this temperature

control loop (monitor - calculate - set), a small display (a simple SCADA (supervisory controls and data acquisition) system) attached to the wall allows me to read the current room temperature and to manipulate its set-points. Depending on the size of the building and the number of processes controlled, many (different) sensors, PLCs, actuators and SCADA systems can be combined and inter-connected to build a larger and more complex PCS.

In a similar way, all our commodities and amenities depend on many different,

complex PCSs e.g. a PCS for water and waste management, for electricity production and transmission, for public and private transport, for communication, for production of oil and gas but also cars, food, and pharmaceuticals. Today, many people live in symbiosis with those PCSs which make their lives cosy and comfortable, and industry depends on them. The variety of PCSs has become a piece of "critical infrastructure", providing the fundamental basis for their general survival.

So what would happen if part or all of this critical infrastructure failed? How would your life change without clean tap water and proper waste disposal, without electricity, without fresh and frozen food? The cool air in the lecture hall will get hot and become uncomfortable. On a wider scale, with no drinking water from the tap, we would have to go back to local wells or collect and heat rain water in order to purify it. Failure of the electricity system would halt public life: frozen goods in supermarkets would warm up and become inedible, fuel pumps would not work anymore, life-preservation systems in hospitals would stop once the local diesel generators ran out of fuel... (this is nicely depicted in the novel "Blackout" by M. Elsberg).

We rely on our critical infrastructure, we rely on PCS and we rely on the technologies behind PCSs. In the past, PCSs, PLCs and SCADA systems and their hardware and software components were proprietary, custom-built, and stand-alone. Expertise was centralised with a few system engineers who knew their system by heart. That has changed in recent decades. Pressure for consolidation and cost-effectiveness has pushed manufacturers to open up. Today,

modern PCSs employ the same technological means that have been used for years in computer centres, in offices and at home: Microsoft's Windows operating system to run SCADA systems; web browser as user interfaces; laptops and tablets replacing paper checklists; emails to disseminate status information and alerts; the IP protocol to communicate among different parts of a PCS; the Internet for remote access for support personnel and experts...

Unfortunately, while benefitting from standard information technology, PCSs have also inherited its drawbacks: design flaws in hardware, bugs in software components and applications, and vulnerabilities in communication protocols. Exploiting these drawbacks, malicious cyber-attackers and benign IT researchers have probed many different hardware, software and protocols for many years. Today, computer centres, office systems and home computers are permanently under attack. With their new technological basis, PCSs underwent scrutiny, too. The sophisticated "Stuxnet" attack by the US and Israel against the control system of Iranian uranium enrichment facilities in 2010 is just one of the more publicised cases. New vulnerabilities affecting PCSs are regularly published on certain web pages, and recipes for malicious attacks circulate widely on the Internet. The damage caused may be enormous.

Therefore, "Critical Infrastructure Protection" (CIP) becomes a must. But protecting PCSs like computer centres, patching them, running anti-virus on them, and controlling their access is much more difficult than attacking. PCS are built for use-cases. Malicious abuse is rarely considered during their design

and implementation phase. For example, rebooting a SCADA PC will temporarily cease monitoring capabilities while updating PLCs firmware usually requires thorough re-testing and probably even re-certification. Both are non-trivial and costly tasks that cannot be done in-line with the monthly patch cycle releases by firms like Microsoft.

Ergo, a fraction (if not many) of today's PCSs are vulnerable to common cyber-attacks. Not without reason, the former advisor to the US president, Richard Clarke, said "that the US might be able to blow up a nuclear plant somewhere, or a terrorist training centre somewhere, but a number of countries could strike back with a cyber-attack and the entire [US] economic system could be crashed in retaliation... because we can't defend it today." (AP 2011) We need to raise our cyber-defences now. Without CIP, without protected SCADA systems, our modern symbiotic life is at risk.

*\*To be published in the annual yearbook of the World Federation of Scientists.*

Check out our website <https://security.web.cern.ch> for further information, answers to your questions and help, or e-mail [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch)

If you want to learn more about computer security incidents and issues at CERN, just follow our Monthly Report: <https://cern.ch/security/reports/fr/monthly-reports.shtml>

Stefan Lueders, Computer Security Team

## Ombud's Corner

## A SHARED ANNIVERSARY!

**As CERN celebrates its 60th anniversary, it not only looks back at its past successes with pride, it also looks ahead at the many other ways in which it can continue to contribute to the groundbreaking work of the scientific community. In the same way, it is normal for its individual members who are approaching a similar birthday to expect to be appreciated not only for the part they have played in the Organization's history, but also for the many other ways in which they can continue to contribute to its future.**

The reality is not always so rosy and our older colleagues sometimes find themselves feeling marginalised and insignificant.

*Anna is an engineer approaching her sixties. Throughout her professional life she has been working on developing technologies for accelerators. In more recent years, she has taken on some coordination tasks where her ability to see the bigger picture and reconcile differences is appreciated. However, little by little, she has been losing touch with the technical side of the job.*

Things move faster and faster in our world and it is indeed a real danger that older people begin to feel no longer on top of things and find themselves in situations where they start doubting their own competence.

*Claire is a young colleague of Anna's. She spends long hours at work and is an asset to the team because of her very strong and up-to-date technical skills. She is also a problem-solver. She considers Anna to be too cautious and reluctant to try new things, and consequently, she often interrupts her*

*during meetings when discussing the technical challenges faced by the group.*

In such situations, the reaction of colleagues is crucial to maintaining team spirit and ensuring that the workplace remains an environment where the many different contributions of individuals are understood and valued.

*After a while, Anna decides to give up and doesn't take part in discussions anymore. The colleagues around the table continue the meetings as if*

nothing unusual has happened. Anna begins to feel invisible. She begins to withdraw from the group's regular interactions and it becomes more and more difficult for her to carry out her coordination tasks with the same high level of enthusiasm as before.

Anna is not alone in feeling invisible. Nowadays, technological progress means that we tend to turn more and more towards technology for information and forget that very often, despite all the technical drawings and specifications that we have recorded in our databases, the real memory of how things were built can only be found in the brains and hands of our older colleagues.

While Claire's 'state of the art' technical skills are invaluable to the team, so too are Anna's wealth

of experience and knowledge of the field; both carry vital information for the success of any project. The key lies in creating an environment that fosters the innovative approaches proposed by recent graduates whilst guarding against behaviours that make older colleagues feel isolated and their expertise undermined.

Isolation very easily leads to a sense of being invisible, and from there it does not take much for someone to begin to feel insignificant.

At CERN, we may not often experience situations like the one described here. However, if you are beginning to feel a little like Anna, or suspect that you may be behaving like Claire, or indeed, if you are a member of their team, do not let

this situation develop any further. Talk to your colleagues or your supervisors about it, nip the situation in the bud and if needed, remember that the Ombud is available to support you in turning the situation around.

At a time when CERN is celebrating its 60th anniversary, it is celebrating your years of contribution as well!

As a reminder, all previous Ombud's Corners can be accessed in the Ombud's blog: [ombuds.web.cern.ch](http://ombuds.web.cern.ch).

Sudeshna Datta-Cockerill

## EMILIO PICASSO (1927-2014)

Many people in the high-energy physics community will be deeply saddened to learn that Emilio Picasso passed away on Sunday 12 October after a long illness. His name is closely linked in particular with the construction of CERN's Large Electron-Positron (LEP) collider.

Emilio studied physics at the University of Genoa. He came to CERN in 1964 as a research associate to work on the 'g-2' experiments, which he was to lead when he became a staff member in 1966. These experiments spanned two decades at two different muon storage rings and became famous for their precision studies of the muon and tests of quantum electrodynamics.

In 1979, Emilio became responsible for the coordination of work by several institutes,

including CERN, on the design and construction of superconducting RF cavities for LEP. Then, in 1981, the Director-General, Herwig Schopper, appointed him as a CERN director and LEP project leader. Emilio immediately set up a management board of the best experts at CERN and together they went on to lead the construction of LEP, the world's largest electron synchrotron, in the 27-km tunnel that now houses the LHC.

LEP came online just over 25 years ago on 14 July 1989 and ran for 11 years. Its experiments went on to perform high-precision tests of the Standard Model, a true testament to Emilio's skills as a physicist and as a project leader.

We send our deepest condolences to his wife and family.

A full obituary will appear in a later edition of the Bulletin.

## Official news

### NEWS FROM CHIS

#### New contract between CERN and UNIQA

Following a competitive call for tender, the consortium UNIQA Switzerland and UNIQA Austria has been awarded the contract for providing third-party administrative services for CERN's Health Insurance Scheme. The contract will enter into force on 1st January 2015 for an initial period of 5 years, renewable by CERN for a further period of 5 years.

This means that the Third-Party Administrator of the CHIS remains the same as before. While the services remain essentially the same, certain improvements are foreseen under this new contract. Some of these will impact the members directly and positively, while others will improve the supervision of the Scheme by CERN's administration. More details will be provided in the next CHIS Bulletin.

#### Approved Hospitals in Geneva: new in 2014

In 2014, CERN has concluded new agreements with the following care providers in Geneva:

- Clinique des Grangettes – approved from January 2014 to end 2015
- Clinique la Colline – approved from July 2014 to end 2016

We remind you that the choice of establishment, of sector of care and of type of room- have an important impact on the reimbursement rates of in-patient treatment (hospitalisation). The table overleaf provides a summary.

The complete and up-to date list of Approved Providers in Switzerland is available on the CHIS website: <http://cern.ch/chis>

For more information, do not hesitate to contact the UNIQA Office by mail [uniqa@cern.ch](mailto:uniqa@cern.ch) or by phone 72730.

\*FCA : Frais à Charge de l'Assuré / Costs borne by the insured member, French acronym FCA.

#### New Information Note on Ex Gratia Payments

The Information Note IN5 describing the procedure to request an ex gratia payment (see CHIS Rules, Art. VII 4.06) has been published and is now available on the CHIS website: <http://cern.ch/chis>

The CHIS Information Notes specify the application of the CHIS Rules and they also provide useful guidance. Members of the CHIS are thus invited to take due note of the information they contain.

Type of establishment	Sector of care	Reimbursement rate	Maximum FCA*	Payment of invoice	Additional cost
Public hospital	Public sector	100 %	0 CHF	By Third-Party Administrator	Any supplement for a single-bed ward is at the expense of the Member.
	Private or semi-private sector	According to general rule	3000 CHF (included in yearly FCA*)	By Third-Party Administrator	
Private hospital	Approved : <ul style="list-style-type: none"><li>• In Switzerland ; any hospital that has concluded a tariff agreement with CERN</li><li>• Outside Switzerland ; any hospital that has a tariff agreement with the national security scheme and applies similar tariffs to CHIS members</li></ul>				
	Not approved				

HR Department  
tel. 74125  
[chis.info@cern.ch](mailto:chis.info@cern.ch)

## CHIS – LETTER FROM FRENCH HEALTH INSURANCE AUTHORITIES “ASSURANCE MALADIE” AND “FRONTALIER” STATUS

Certain members of the personnel residing in France have recently received a letter, addressed to themselves and/or their spouse, from the French health insurance authorities (*Assurance Maladie*) on the subject of changes in the health insurance coverage of “frontalier” workers.

It should be recalled that employed members of personnel (MPE) are not affected by the changes made by the French authorities to the frontalier workers’ “right to choose” (droit d’option) in matters of health insurance (see [cern.ch/chis](http://cern.ch/chis) for more details), which took effect as of 1 June 2014, as they are not considered to be frontalier workers. Associated

members of the personnel (MPA) are not affected either, unless they live in France and are employed by a Swiss institute.

For the small number of MPAs in the latter category who might be affected, as well as for family members who do have frontalier status, CERN is still in discussion with the authorities

of the two Host States regarding the health insurance coverage applicable to them.

We hope to receive more information in the coming weeks and will keep you informed via the CHIS web site and the CERN Bulletin.

HR Department



## SUBSIDISED ENERGY PRICES IN FRANCE: TPN – TARIF DE PREMIÈRE NÉCESSITÉ (“BASIC NEEDS” ELECTRICITY PRICE) AND TSS – TARIF SPÉCIAL DE SOLIDARITÉ (SPECIAL SOLIDARITY PRICE FOR NATURAL GAS)

Some members of the CERN personnel residing in France have once again received a letter informing them that they are eligible for the “TPN” and/or “TSS” subsidised energy prices (see Bulletin No. 08-09/2014).

At the beginning of the year, the Organization contacted the French authorities, who confirmed that these subsidies are **not applicable to members of the CERN personnel**.

The Organization therefore asks the members of its personnel who receive such a letter to call the freephone number (numéro vert) provided\* to say **that they do not wish to benefit from these subsidised energy prices**.

members of its personnel that, notably in line with the Code of Conduct, they are expected to refrain from unduly seeking to obtain such social benefits or subsidies and, where necessary, to take the necessary steps to relinquish them.

The French authorities and the Organization are working closely to ensure that these letters are no longer sent to the members of the CERN personnel.

\*From France: 0 800 333 123 for the TPN and 0 800 333 124 for the TSS.

*Human Resources Department  
Hr-Head.Office@cern.ch*

The Organization would like to remind the

## CERN'S NEW SAFETY POLICY

The documents below, published on 29 September 2014 on the HSE website, together replace the document SAPOCO 42 as well as Safety Codes A1, A5, A9, A10, which are no longer in force. As from the publication date of these documents any reference made to the document SAPOCO 42 or to Safety Codes A1, A5, A9 and A10 in contractual documents or CERN rules and regulations shall be deemed to constitute a reference to the corresponding provisions of the documents listed below.

“The CERN Safety Policy”

“Safety Regulation SR-SO - Responsibilities and organisational structure in matters of Safety at CERN”

“General Safety Instruction GSI-SO-1 - Departmental Safety Officer (DSO)”

“General Safety Instruction GSI-SO-2 - Territorial Safety Officer (TSO)”

“General Safety Instruction GSI-SO-3 - Safety Linkperson (SLP)”

“General Safety Instruction GSI-SO-4 - Large Experiment Group Leader In Matters of Safety (LEXGLIMOS)”

“General Safety Instruction GSI-SO-5 - Experiment Safety Officer (EXSO)”

“General Safety Instruction GSI-SO-6 - Specialised Safety Officer (SSO)”

“General Safety Instruction GSI-SO-7 - Project Safety Officer (PSO)”

“General Safety Instruction GSI-SO-8 - Radiation Safety Support Officer (RSSO)”

“General Safety Instruction GSI-SO-9 - Departmental Safety Officers Committee (DSOC)”

“General Safety Instruction GSI-SO-10 - Complex Safety Advisory Panel (CSAP)”

“General Safety Instruction GSI-SO-11 - Specialised Safety Officers Committees (SSOC)”

## Seminars

THURSDAY OCTOBER 23, 2014

14:00 TH BSM Forum TBA TH common room  
16:30 CERN Colloquium Colliding Worlds  
- How Cutting-Edge Science is Redefining Contemporary Art Main Auditorium

FRIDAY OCTOBER 24, 2014W

14:00 Particle and Astro-Particle Physics  
Seminars TBA TH Conference Room