

## A SUPERCONDUCTING SHIELD TO PROTECT ASTRONAUTS

The CERN Superconductors team in the Technology department is involved in the European Space Radiation Superconducting Shield (SR2S) project, which aims to demonstrate the feasibility of using superconducting magnetic shielding technology to protect astronauts from cosmic radiation in the space environment. The material that will be used in the superconductor coils on which the project is working is magnesium diboride ( $MgB_2$ ), the same type of conductor developed in the form of wire for CERN for the LHC High Luminosity Cold Powering project.



Image: K. Anthony/CERN.

Back in April 2014, the CERN Superconductors team announced a world-record current in an electrical transmission line using cables made of the  $MgB_2$  superconductor. This result proved that the technology could be used in the form of wire and could be a viable solution for both electrical transmission for accelerator technology

and long-distance power transportation. Now, the  $MgB_2$  superconductor has found another application: it will soon be tested in a prototype coil that could provide the solution to ensure safe trips for astronauts during deep-space missions. The idea is to create an active magnetic field to shield the spacecraft from high-energy cosmic

(Continued on page 2)



### HOT NEWS FROM HOME AND ABROAD

The heatwave affecting many parts of Europe has been often in the news this summer, but we've also had plenty of "hot news" at CERN, in particular regarding the LHC and the experiments.

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### Published by:

CERN-1211 Geneva 23, Switzerland

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

© 2015 CERN - ISSN: Printed version: 2077-950X

Electronic version: 2077-9518

# A word from the DG

## HOT NEWS FROM HOME AND ABROAD

There's been great excitement everywhere about the restart of the LHC. However, we should not forget just how much work was done during the long shutdown, and that in many ways it's like starting up a new machine, with all the surprises that can bring. This year, the LHC has already run at the record-breaking collision energy of 13 TeV and now we're seeing the careful, step-by-step procedure to increase the beam intensity. The aim, as it always was, is to have the collider up to its full performance by the end of the year, so that we can then embark on three years full of physics.

Nevertheless, the LHC experiments already have 100 times more data than they did at around the same time after the machine first started up at a collision energy of 7 TeV in 2010. This has allowed the experiments to renew their acquaintance with many "old friends" among the fundamental particles and processes of the Standard Model.

It's also already provided sufficient data for the first publication to come out of Run 2.

This was big news at the first of the year's major international particle-physics conferences, the 2015 European Physical Society Conference on High Energy Physics (EPS-HEP2015), which took place recently in Vienna. Status reports on the LHC, ATLAS and CMS all figured in the main plenary sessions – and were very positively received. They included the first results at 13 TeV, with spectacular events that show the power of the energy increase. It's clear from the conference that all eyes are on Run 2; not only particle physicists, but the physics community at large is eagerly awaiting the more significant amount of data that is to come. In the meantime, the final harvest from Run 1 continues, and can still provide exciting results, as LHCb's discovery of a new class of particles, the pentaquarks, has amply demonstrated.

The conference also revealed a clear trend towards further exploiting the synergies between particle physics and cosmology. The two disciplines investigate two fundamental scalar fields, which appear similar and may even be connected. These are the field associated with the Brout–Englert–Higgs mechanism in particle physics, and one that is linked to a period of extremely rapid expansion, or "inflation", in the very early Universe.

Back at CERN, the latest news concerns more than the LHC. I am pleased to announce that as from today - 31 July - Pakistan is an Associate Member State of CERN. Official notification that Pakistan has ratified the Association Agreement arrived through diplomatic channels this morning. I am certain that you will join me in welcoming Pakistan as an Associate Member State.

Rolf Heuer

## A SUPERCONDUCTING SHIELD TO PROTECT ASTRONAUTS

particles. "In the framework of this project, CERN is testing MgB<sub>2</sub> tape in a configuration that has specifically been developed for the SR2S project by Columbus Superconductors," explains Amalia Ballarino, Superconductors and Superconducting Devices section leader.

"In the framework of the project, we will test, in the coming months, a racetrack coil wound with an MgB<sub>2</sub> superconducting tape," says Bernardo Bordini, coordinator of CERN activity in the framework of the SR2S project. "The prototype coil is designed to quantify the effectiveness of the superconducting magnetic shielding technology."

During long-duration trips in space and in the absence of the magnetosphere that protects people living on Earth, astronauts are bombarded with high-energy cosmic rays that might cause a significant increase in the probability of various types of cancers. Because of this, exploration missions to Mars or other distant destinations will only become realistically possible if an effective solution for adequately shielding astronauts is found. "If the prototype coil we will be testing produces successful results, we will have contributed important information to the feasibility of the superconducting magnetic shield," says Ballarino.

There are many more challenges to overcome before a spacecraft shield can be built: various possible magnetic configurations need to be tested and compared and other key enabling technologies need to be developed. But the MgB<sub>2</sub> superconductor seems to be very well-placed to take part in this challenging adventure as, among its many advantages, there is also its ability to operate at higher temperatures (up to about 25 K) thus allowing the spacecraft to have a simplified cryogenic system. Watch this "space"!

Antonella Del Rosso

### The SR2S Project

SR2S is a Collaborative Project under the Space Theme of the EU Seventh Framework Research Programme. The project started in January 2013 and will end in December 2015. The aim of the SR2S project is to provide a pathway for the further development of a protective shield

for astronauts, which should be launched in the market within the next two decades.

For more information visit: <http://www.sr2s.eu/>.

# LHC REPORT: MACHINE DEVELOPMENT

Machine development weeks are carefully planned in the LHC operation schedule to optimise and further study the performance of the machine. The first machine development session of Run 2 ended on Saturday, 25 July. Despite various hiccoughs, it allowed the operators to make great strides towards improving the long-term performance of the LHC.

The main goals of this first machine development (MD) week were to determine the minimum beam-spot size at the interaction points given existing optics and collimation constraints; to test new beam instrumentation; to evaluate the effectiveness of performing part of the beam-squeezing process during the energy ramp; and to explore the limits on the number of protons per bunch arising from the electromagnetic interactions with the accelerator environment and the other beam.

Unfortunately, a series of events reduced the machine availability for studies to about 50%. The most critical issue was the recurrent trip of a sextupolar corrector circuit – a circuit with 154 small sextupole magnets used to correct errors in the main dipoles – in arc 7-8 at high energy. This problem resulted in the cancellation of the last test runs at high energy and the MD session stopping some

8 hours earlier than planned. However, the time with beam was effective in terms of the results achieved. A large set of instruments were developed or tested, including high-resolution beam position monitors (DOROS), robust beam current monitors and two systems to examine the frequency content of the beam.

Thanks to the MD studies, the beam sizes at the two high-luminosity interaction points (where the ATLAS and CMS detectors are installed) were reduced by a factor of 1.4. The corresponding machine optics were finely tuned to be ready for high-intensity beams. However, before these optics can be used in operation, further studies are mandatory to understand and validate other important parameters, including the machine aperture, new collimator settings, a reduced crossing angle and, possibly, non-linear corrections in the quadrupole triplets next to the interaction

points. These topics will be addressed in future MD weeks to pave the way towards higher luminosities in Run 2.

For the first time, operators were able to perform the beam-size squeeze during the energy ramp. This opens up the possibility of saving up to 10 minutes per fill in a slightly more ambitious configuration than that tested last week. Results on higher bunch populations require careful analysis of the collected beam data. These will soon be available in detailed reports to be published as LHC MD notes.

At the end of the MD period, the LHC went into its second scrubbing run, a two-week period that aims to prepare the machine fully for operation with 25-nanosecond bunch spacing, planned for the first weeks of August.

*We would like to take this opportunity to thank all the MD teams, system experts, management, operators and physics experiments involved during the MDs for their high flexibility, dedication and endurance.*

Rogelio Tomás García for the LHC team

## CERN'S SUMMER OF ROCK

When a rock star visits CERN, they don't just bring their entourage with them. Along for the ride are legions of fans across the world – many of whom may not be the typical CERN audience. In July alone, four big acts paid CERN a visit, sharing their experience with the world: Scorpions, The Script, Kings of Leon and Patti Smith.



@TheScript tweeted: #paleofestival we had the best time! Big love. #CERN (Image: Twitter).





The Scorpions visit Microcosm.

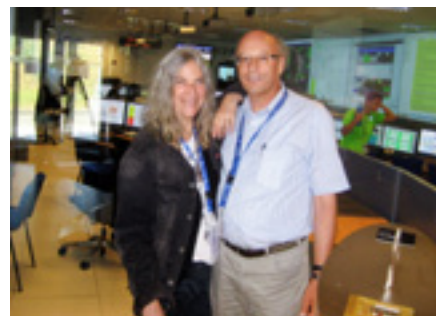
It all started with the Scorpions, the classic rock band whose “Wind of Change” became an anthem in the early 1990s. On 19 July, the band braved the 35-degree heat to tour the CERN site on foot – visiting the Synchrocyclotron and the new Microcosm exhibition. The rockers were very enthusiastic about the research carried out at CERN, and talked about returning in the autumn during their next tour stop.

Two days later, The Script rolled in. This Irish pop-rock band has been hitting the top of the charts since the early 2000s, with albums such as “Science & Faith” and “#3”. During their visit to the CCC and the ATLAS control centre,

the band tweeted photos and messages to their 2.2 million followers. “There’s a deep connection between music and physics,” said lead singer Danny O’Donoghue. “ATLAS and the LHC really bring physics to life, and also share the knowledge with the world, which is very important.”

That evening, The Script donned their CERN helmets on stage at Paléo and asked the audience to make a “C” sign for CERN. The resulting photo appeared all across their social media – an epic tribute to their visit.

The next day saw a visit from Matthew and Jared Followill from the platinum-selling



Patti Smith and former ATLAS spokesperson Peter Jenni at the ATLAS control centre.

rock band Kings of Leon. “We’d seen Particle Fever and had read news stories about the big discoveries made here at CERN,” said Jared, the band’s bass guitarist. “Our visit has made us that much more interested in learning more.” He went on to describe his visit on Twitter as “incredibly enlightening and encouraging for our future”.

Finally, on 25 July, Rock and Roll Hall of Fame star Patti Smith visited CERN with her full band in tow. An icon since the 1970s, Patti is widely known for her song “Because the Night”. She spent the morning touring the CERN site, visiting the AD Hall, the CCC, the ATLAS control centre and the Synchrocyclotron. Patti spoke with Monica Bello of the Arts@CERN programme, and at some length with Peter Jenni, former ATLAS spokesperson.

While these musicians were touring the Laboratory, CERN also welcomed visitors to the newly reopened Microcosm exhibition (see on page 7). Proof that you don’t need a platinum album – or even a physics background – to enjoy a CERN tour.

Katarina Anthony



## The LHC jams at the Montreux Jazz Festival

CERN joined the A-list line-up at the Montreux Jazz Festival for its third annual ‘The physics of music and the music of physics’ performance.

The event featured a “recital” by the LHC itself! Through a process known as “sonification”, collisions in the ATLAS experiment were converted into musical notes. Jazz pianist Al Blatter joined in with his musical magic to produce a cosmic duet, which you can listen on: <http://cern.ch/go/98nG>.

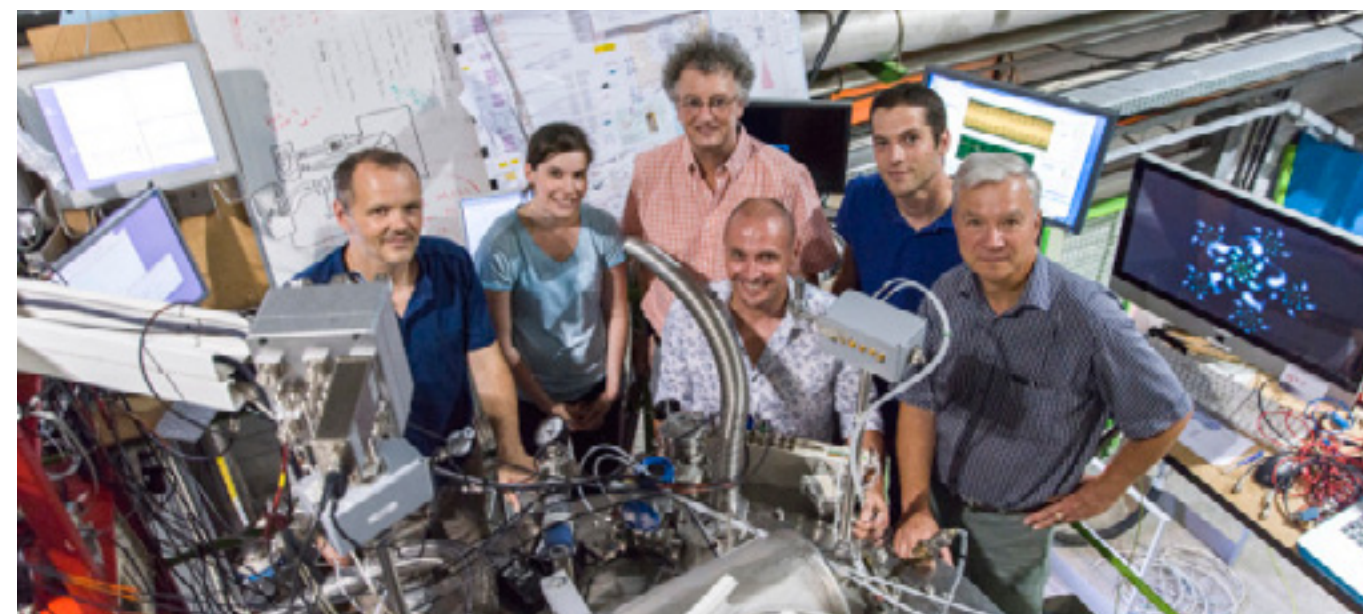
The show also featured an improvised performance by CERN’s Robert Kieffer

(Beam Instrumentation group) and Gaëtan Parsihian (CNRS, Marseille). Using sounds recorded around CERN, the duo created an experimental piece that – with the help of a circular speaker system – engaged the audience from every direction.

Highlights from the Montreux programme – including live sonification of LHC collisions – will be featured at Researchers’ Night on 25 September. Check out future issues of the *Bulletin* for more details.

# AREA OF TURBULENCE

**As a member of the EuHIT (European High-Performance Infrastructures in Turbulence) consortium, CERN is participating in fundamental research on turbulence phenomena. To this end, the Laboratory provides European researchers with a cryogenic research infrastructure, where the first tests have just been performed.**



The last day of data collection, tired but satisfied after seven intense days of measurements. Around the cryostat, from left to right: Philippe-E. Roche, Éléonore Rusaouen (CNRS), Olivier Pirotte, Jean-Marc Quetsch (CERN), Vladislav Benda (CERN). Not in the photo: Laurent Le Mao (CERN), Jean-Marc Debernard (CERN), Jean-Paul Lamboy (CERN), Nicolas Guillotin (CERN), Benoit Chabaud (Grenoble Uni), and Gregory Garde (CNRS).

CERN has a unique cryogenic facility in hall SM18, consisting of 21 liquid-helium-cooled test stations. While this equipment was, of course, designed for testing parts of CERN’s accelerators, it can also be used for other laboratory experiments, notably for studying “very intense turbulence” in fluids.

Very intense turbulence is a natural phenomenon observed in numerous situations – in the atmosphere and in the ocean, in the

slipstream of planes and trains, and even in stars – but it is very difficult to study. “The appearance of this phenomenon depends mainly on three factors,” explains Philippe Roche, a researcher at CNRS. “The velocity of the fluid, its viscosity and the system’s size (several kilometres in the case of atmospheric or oceanic turbulence, for example).” The greater the velocity and size and the lower the viscosity, the more intense the turbulence. In fluid mechanics, the level of turbulence is

described by the Reynolds number (Re)\*: a high Reynolds number indicates high turbulence.

The cryogenic facility in SM18 is the ideal place to generate a very intense turbulence phenomenon in perfectly controlled laboratory conditions: its cooling system distributes cryogenic helium, whose viscosity is extremely low (200 times lower than that of air in the experimental conditions), and that, combined with the extremely large size of the



cryostat in which the experiment takes place (1.1 metre in diameter and 4.6 metres high – see diagram), leads to Reynolds numbers of the order of  $10^7$ . “This infrastructure at CERN is capable of producing turbulence of an intensity comparable to that observed in certain atmospheric phenomena,” says Olivier Pirotte, head of the Mechanical and Engineering Support section of the Cryogenics group and coordinator of the EuHIT project at CERN. “But to achieve this result, we have to create conditions as close to the theoretical model as possible, which means working with a jet of helium that’s 100% gaseous.” The Cryogenics group has therefore developed a heating device that, when installed in the liquid-helium supply line, ensures that the fluid passes into its gaseous state before being injected into the cryostat.

In order to study the area of turbulence and to “see” what happens at its core, the EuHIT researchers are designing sensors specially adapted for the cryostat provided by CERN. The data collected (velocity, temperature and pressure) will allow them to learn a lot about this phenomenon. For the moment though, the experiment is being fine-tuned, in collaboration with CNRS. The first physics measurements are expected to be taken when the experiment receives a share of the helium flow in October (see box); the second run, this time at full flow, is expected to take place in January.

\*Reynolds number ( $Re$ ) = (velocity x size) / kinematic viscosity.

Anaïs Schaeffer

See the slideshow:

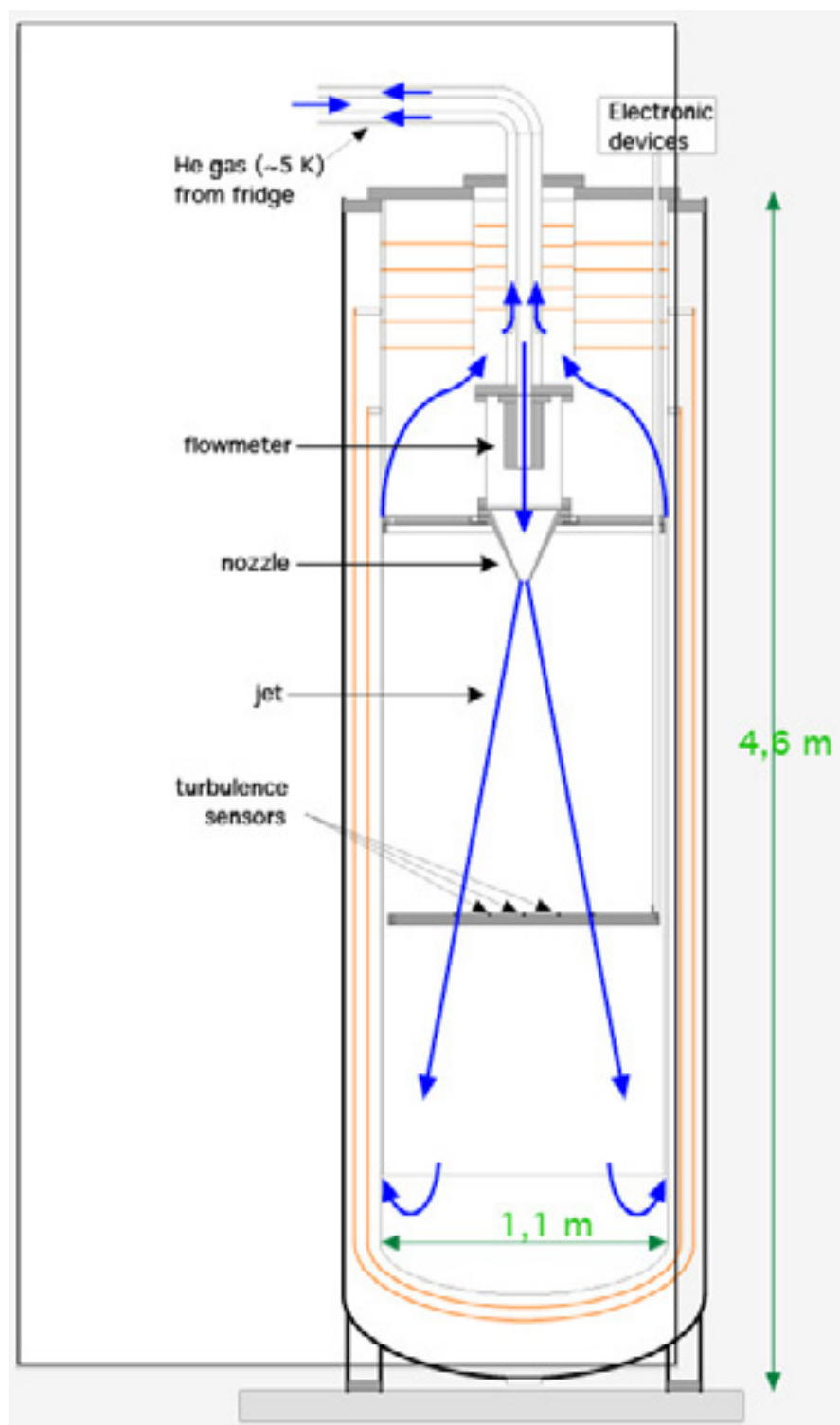


Diagram of the cryostat in which the experiment takes place.

### CERN, a member of EuHIT (European High-Performance Infrastructures in Turbulence)

CERN’s involvement in research into turbulence phenomena dates back to the year 2000. A new cryogenic infrastructure had just been installed in SM18 to test the String for the future LHC. A change in the test schedule in 2000 freed up the new cryogenic system, and so CERN Management agreed to make it available to researchers specialising in the study of turbulence phenomena, allowing them to conduct experiments in early 2001.

From 2002 to 2007, the cryogenic facility was used exclusively for the LHC. In 2007, once the tests for the LHC had been completed, the “turbulence” community met at CERN and decided to apply for funding from Europe. CERN thus became a partner in the EuHIT consortium (within the EU’s Framework Programme 7): <http://www.euhit.org/partners>.

Thanks to the European funding, CERN is able to provide, at no extra cost to the Laboratory, an exceptional research infrastructure for European researchers for two weeks per year from 2015: one week of shared flow (which means that the liquid helium is shared between various tests conducted in parallel) and one week at full flow (where 100% of the liquid helium goes to EuHIT).

## MICROCOSM RELOADED!

On 20 July, Microcosm reopened its doors to the public. CERN’s guides are already leading many enthusiastic visitors through the new attractions of the popular exhibition. More areas will reopen progressively over the coming weeks before the official inauguration this autumn.



A group of visitors is guided through the new Microcosm exhibit.

After six months of extensive refurbishment work, Microcosm is back and open for public visits. As some installations are not yet up and running, CERN’s guides are there to provide visitors with additional explanations. “The two groups I guided were amazed to see real detector components before their eyes, laid out in inviting and informative displays,” says Achintya Rao, member of the

CMS collaboration and a CERN guide. “The life-sized CMS mock-up and the CCC panorama are excellent locations to have in-depth conversations with enthusiastic visitors and give them a glimpse into everyday life at CERN.”

The total renovation of the exhibition is a collective CERN effort. “Entirely remodelling an exhibition and bringing a building up to

modern safety standards all in the space of only eight months was a real challenge,” confirms Emma Sanders, the project leader and member of the Education Group. “Practically all CERN’s departments have been involved! We had help from right across the Lab.”

In particular, the amazing new design was the result of a very successful collaboration with the Spanish design team, Indissoluble. “One of the biggest challenges was the reconfiguration of the previous space, consisting of a series of small areas with different functions and different constraints to the visitor flow,” says Cristina Garcia, the architect. “The way we dealt with this was to create larger and clearer spaces to allow a smoother visit, which also seems to increase the existing area.”

Some of the new exhibits were challenging to build. “The life-sized CMS mock-up is made from 46 different extruded pieces, multiplied by mirrors on walls and floors, creating a full slice through the experiment. The result is spectacular and makes a great impact on the visitor,” says Garcia. “It has been a real thrill for us to be so immersed in the contents and the design process of the Microcosm exhibition. Initially, some of us got lost in CERN’s infinite corridors, but after a few visits we got to love the Laboratory and we consider it our home. People here have made us feel part of CERN’s big family.”

Stefania Pandolfi

## FAMILY REUNION FOR THE UA2 CALORIMETER

After many years in CERN’s Microcosm exhibition, the last surviving UA2 central calorimeter module has been moved to Hall 175, the technical development laboratory of the ATLAS Tile Hadronic Calorimeter (Tilecal). The UA2 and ATLAS calorimeters are cousins, as both were designed by Otto Gildemeister. Now side by side, the calorimeters illustrate the progress made in sampling organic scintillator calorimeters over the past 35 years.

From 1981 to 1990, the UA2 experiment was one of the two detectors on CERN’s flagship accelerator, the SPS. At the heart of the UA2 detector was the central calorimeter. It was made up of 24 slices – each weighing four tonnes – arranged like orange segments around the collision point. These calorimeter slices played a central role in the research carried out by UA2 for the discovery of W bosons, as well as in the detection of

hadronic jets. Once UA2 was taken offline, 23 of the slices were dismantled and their materials repurposed – leaving one slice for the history books.

Since the end of June, the UA2 calorimeter slice has had a new home in Hall 175, where the Tilecal calorimeter currently used in the ATLAS detector continues to be developed. “The Tilecal geometry is the natural evolution



Otto Gildemeister with two colleagues from UA2, Luigi Di Lella (left) and Peter Jenni (right), in front of the UA2 central calorimeter ‘orange slice’ module.



of the UA2 calorimeter concept,” says Irene Vichou, ATLAS Tilecal project leader.

“For example,” explains Ana Henriques, former Tilecal project leader, “the Tilecal has scintillating tiles oriented perpendicular to the colliding beams instead of the traditional

parallel orientation, and it uses wavelength-shifting fibres instead of light-guide plates.”

Otto Gildemeister, the expert who designed both calorimeters, visited Hall 175 recently during a trip to CERN. “It was nice to visit the well-conserved UA2 calorimeter ‘orange

slice’ module, which, after so many years, still appears quite familiar to me,” he said. “To see it alongside the present and future ATLAS Tile Calorimeter developments was touching.”

Abha Eli Phoboo



The ATLAS Tile Calorimeter prototypes (left) and the UA2 central calorimeter (right) in Hall 175. (Image: Mario Campanelli/ATLAS.)

## CERN SOFTWARE DEVELOPERS GATHERING IN SEPTEMBER

**Hundreds of developers work on many different projects at CERN – from data analysis to beam operations and administrative applications. As of this September, they will have an opportunity to meet each other at the newly established Developers@CERN Forum.**

“We go to conferences elsewhere but we hardly ever meet here at CERN, where we all work on our own separate software projects,” says José Carlos Luna, a member of the IT department and one of the organisers of the first Developers@CERN Forum. Indeed, although several CERN departments have software developers working in their teams, there is no proper “community” built around them.

The first Developers@CERN Forum will be held on 28 and 29 September. The event is being organised by a few developers from the IT department, together with colleagues from the GS and EN departments. Its main scope is to reach out to all the departments in an effort to bring all CERN’s software developers together to discuss common issues. This first forum will take place in the IT Amphitheatre and the Training Centre. “The programme will include presentations and workshops by colleagues working on various software development

projects,” explains Marwan Khelif, member of the organising team. “The topic for this first event will be ‘Software Quality’, with a focus on testing techniques and reliability. This is a topic of interest for all the developers, regardless of their specific fields of activity.”

Anyone interested in submitting a presentation or a topic for a workshop should visit: <http://cern.ch/go/vh76>. “We are eagerly awaiting contributions from colleagues throughout CERN,” says Sebastian Łopieński, another member of the organising team. “The whole idea is to exchange best practices and solutions to ensure that our code is highly reliable. Everyone is working on various techniques but so far there has been little opportunity to meet and share experiences. We hope that this event is filling the gap.”

Conceived in a similar way to the CAPPS initiative, the Developers@CERN Forum

will be held a few times per year to keep the community connected. “Both initiatives aim to bring together those facing similar problems,” confirms Łopieński. “However, while there are maybe ten people working part-time on mobile apps at CERN, there are certainly hundreds and probably more than a thousand people at CERN who develop software at least part-time. So the scale of the two events is different.”

With this initiative, the organisers hope to involve a large proportion of CERN’s developers. If you are interested in contributing or just participating as a member of the audience, please visit the dedicated website on: <http://cern.ch/go/8pXd> or e-mail the organisers on: [developers-forum-organizers@cern.ch](mailto:developers-forum-organizers@cern.ch).

Antonella Del Rosso

## ROCK STARS FOR THE DAY

**After a two-year hiatus, the CERN Hardronic Festival is back! On 8 August, ten CERN MusiClub bands will take to the stage for the popular event. As usual, the non-stop show will take place on the terrace of Restaurant 3 and will run until after midnight.**



The Canettes Blues Band, part of the CERN MusiClub, performing live on the Music In The Park stage at the Montreux Jazz Festival, on 18 July 2013.

A large range of musical styles will entertain the audience: from Irish folk, via 70s/80s/90s rock, to pop, blues and R&B. Alongside the music there will be activities for kids and food and drink stands. This year, the income from food sales will be donated to charity.

The spirit that has characterised the festival ever since the first event in 1989 is that of a

staff party. Any band who volunteers to play also helps to organise the event and set up the stage. “This is a really good thing because a festival that has been growing for many years requires a considerable amount of hard work and a large number of volunteers,” explains Daniel Vazquez Rivera, a member of the DGS-SEE group and one of the organisers of the event this year. “If we have enough bands, then we carry on organising the Festival, otherwise we can’t.”

With this basic principle in mind, the Festival is taking place for the 24<sup>th</sup> time in 2015. “Approximately,” points out Simon Baird, EN Department Deputy Head and President of the MusiClub, “as there have been years in which it wasn’t held. Some years it was big, others it was small, others it was very small.”

This year, “the standard of the performances will be very high,” promises Vazquez Rivera. “If the weather is with us, people will be able to see some very good performances. The bands

that will take to the stage are not just people at CERN who decided to buy a guitar and see what happens. They could really play at Paléo or the Montreux Festival. And I’m not just saying that because I know them!”

“The Hardronic Festival is the opportunity for CERNois who want to play at Paléo,” confirms Baird. “Since they are also very good scientists and work at CERN, they cannot be at Paléo. So we set up a stage for them to be rock-and-roll stars for one day.”

There will be a shuttle service from the CERN Reception to the venue. The programme and other practical information for CERN people, such as how to reach the venue and how to add family and friends to the guest list, can be found on: <http://cern.ch/go/RQ8l>.

*The MusiClub would like to thank the CERN Staff Association and the CERN Management for their continued support, without which this event could not take place.*

Stefania Pandolfi

## KIDS EXPLORE CERN’S UNIVERSE

**Following last year’s successful science camp, the kids enrolled in the Staff Association’s 2015 Summer Camp experienced some of the Laboratory’s activities for one day each week in July.**



The kids played at being firefighters for an afternoon at the CERN Safety Training Centre.

One of the highlights of this year’s Summer Camp organised by the CERN Staff Association were the days devoted to learning about the everyday life of the Laboratory. On those days, the kids had the opportunity to play at being scientists as part of educational activities organised by Sterrenlab, and went to visit the CMS Control Room in Meyrin and the CERN Safety Training Centre in Prévessin. Here, firefighters Antonio Cuenca Perez and Davide Pagnani accompanied the kids to visit the fire truck and, in a lively and entertaining way, let them experience “hands-on” the basic safety rules that apply at CERN.

Antonella Del Rosso



## DOWNLOADING FILMS IS NO PECCADILLO

**Dear Summer Students, within the Organization, you have many possibilities to pursue your natural curiosity and acquire as much new knowledge as you can siphon into your brain. CERN provides you with the academic freedom to do so, with almost no limitations. But hold on: “free” and “no limitations” don’t mean that you can do whatever you want...**

Please note that, when using CERN’s computing facilities, when sending e-mails from your CERN e-mail address, when using your laptop/smartphone/computer, you must follow a basic framework of rules, the CERN Computing Rules. I would like to focus on one particular aspect of those rules: that of accessing music, videos, films or computer games from popular websites like ThePirateBay or using Bittorrent.

CERN has an awesome connection to the Internet, lots of bandwidth and a high capacity for web downloads. However, this does not mean that downloading music, videos, films or computer games is permitted. It is not – basically for two reasons: the first is that CERN’s network is primarily for professional purposes and such downloads are not usually work-related. More important, however, are the legal aspects of such downloads: the

downloading of copyrighted material, or at least the sharing thereof, is against the law in many European countries. Copyright violation is no trivial offence. It is no peccadillo!

In the past, CERN has received cease-and-desist letters from major entertainment labels pointing us to individual users who have violated copyright in this way. This is not only embarrassing for the Organization and damages its reputation but can also have financial consequences for the perpetrator (see our *Bulletin* article “Do you have 30 kCHF pocket money?”). Hence, copyright violations are not tolerated at all by the Organization and will result in administrative measures as consequences to you (plus the financial liabilities).

In order to spare you and us from that mess, please make sure that your Bittorrent clients

are disabled before you connect to CERN’s wired or wireless networks. Please refrain from visiting illegal download portals for music, videos/films and computer games while being connected via CERN. Instead, take advantage of commercial solutions like Steam, iTunes, Netflix, MyVideo... And one final word: please also refrain from browsing porn pages. We usually register such access and a notification to you might make you feel embarrassed and awkward.

For further information, questions or help, check: <https://security.web.cern.ch> or contact us at [Computer.Security@cern.ch](mailto:Computer.Security@cern.ch)

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

Stefan Lueders, Computer Security Team

## Official news

### 15 SEPTEMBER: ANNUAL INFORMATION MEETING OF THE PENSION FUND

**All members and beneficiaries of the Pension Fund are invited to attend the Annual Information Meeting.**

**CERN Council Chamber  
Tuesday, 15 September 2015  
9:30 a.m. - 11:30 a.m.**

Following a presentation by the Chief Executive Officer of the Fund there will be a Questions and Answers session. Members and Beneficiaries are welcome to send questions in advance of the meeting by post to:

Mr Matthew Eyton-Jones  
“Annual Information Meeting”  
CEO - CERN Pension Fund  
Office 5-5-012, Postbox C23800  
CH- 1211 Geneva 23 - Switzerland

Copies of the 2014 Pension Fund Financial Statements are already available as a print-

able PDF on the Pension Fund website (<http://pensionfund.cern.ch/en/financial-management/financial-statements>) and will also be distributed at the annual meeting.

\*Coffee and croissants will be served prior to the meeting as of 9:00 a.m.\*

CERN Pension Fund

### INDIVIDUAL BREAKDOWN OF PENSION RIGHTS AND END OF CONTRACT

**As in previous years, members of the CERN Pension Fund will shortly receive their “Individual breakdown of pension rights” by e-mail.**

In this respect, we would like to remind members that according to Articles II 1.11 - II 1.12 (calculation and payment of the transfer value) and II 2.02 (retirement pension), several options are possible at the end of their contract (depending on their length of

service in the Fund):

- payment of the transfer value into a personal bank account,
- payment of the transfer value into a new pension scheme,
- pension (deferred, anticipated or retirement).

Benefits Service  
CERN Pension Fund

### EDUCATION FEES – NEW FORMS

**The application forms for the payment of education fees have been updated and are now available in the Admin e-guide (under the “Useful Documents” heading):**

- Payment of education fees (including language course fees) – AC12A (form to be used by staff members recruited before 1 January 2007, with the exception of former “local staff”).

- Payment of education fees – AC12B (form to be used by staff members recruited on or after 1 January 2007, by fellows, scientific associates and guest professors and by former “local staff” whose contracts started before 1 January 2007).

The Education Fees service will continue to accept the old forms until the end of the current academic year, i.e. until 31 August 2015.

Members of the personnel are reminded that any false declaration or failure to declare information with a view to deceiving others or achieving a gain that would result in a financial loss for CERN or in damage to its reputation constitutes fraud and may lead to disciplinary action, in accordance with Article S VI 2.01 of the Staff Rules.

For more information (benefits, procedure, reference documents, etc.), please consult the pages of the Admin e-guide relating to

the payment of education fees, as well as the corresponding FAQ section, which has also been updated.

Human Resources department  
[schoolfees.service@cern.ch](mailto:schoolfees.service@cern.ch)

## Take note

### VOTE FOR YOUR FAVORITE TOURIST ATTRACTION ON “LE DAUPHINÉ LIBÉRÉ”

During the summer, the French regional daily newspaper *Le Dauphiné Libéré* has been inviting its readers to vote for their favourite tourist attraction (natural or otherwise) in the Bellegarde area and the Pays de Gex, and CERN is one of the nominees.

This is a great opportunity for us to communicate directly with people living in the region, particularly those who have not yet had the chance to visit CERN, and who, thanks to this survey, might be curious to learn more about the Laboratory and pay us a visit. Remember, visits to CERN are free of charge all year round!

We invite you to vote for CERN on: <http://cern.ch/go/B6dK>.

We’re counting on your votes!

CERN Local Communication team

### SUMMER RESTAURANT OPENING TIMES

**Restaurant No. 1:** Open as usual in July and August. Open from 7 a.m. to 10 p.m. on Thursday, 10 September (*Jeûne genevois*).

**Restaurant No. 2:** Open as usual in July and August. Closed on Thursday, 10 September (*Jeûne genevois*) and Friday, 11 September. The Brasserie (table service) will be closed from Monday, 4 August to Friday, 11 September.

**Restaurant No. 3:** Open as usual in July and August, but closed on Saturday, 1 August; Saturday, 15 August; Thursday, 10 September (*Jeûne genevois*); and Friday, 11 September.

**Snack bar in Building 54:** Closed from Monday, 4 August to Friday, 11 September.

**Snack bars in Buildings 13, 30 and 6:** Closed on Thursday, 10 September (*Jeûne genevois*) and Friday, 11 September.

### CONFERENCE: SUPERCONDUCTIVITY, THEORY AND PRACTICAL CHALLENGES OF A QUANTUM PHENOMENON | 25 AUGUST | UNI DUFOR

On Tuesday, 25 August, J. Georg Bednorz (Nobel prize in physics 1987, IBM Research Zurich) and Louis Taillefer (physicist and professor at the University of Sherbrooke, Canada, and at the Canadian Institute for Advanced Research) will give a conference on the fascinating theme of superconductivity.

**“Superconductivity: theory and practical challenges of a quantum phenomenon”  
Uni Dufour  
Tuesday, 25 August at 7 p.m.**

This conference is organized by the Faculty of science of the University of Geneva, as part of the International Congress Materials and Mechanisms of Superconductivity (M2S - 2015).

Discovered more than 100 years ago, superconductivity remains one of the most fascinating manifestations of the laws of physics, observable only at low temperatures. This phenomenon, which allows the transport of electricity without any loss of energy, leads to various technological applications, for example in magnetically levitated vehicles, in MRI and in the LHC, Large Hadron Collider at CERN.

J. George Bednorz will talk about the history of the subject, noting that for many years it was relegated to the realm of technological utopia, since no one imagined that superconductivity could occur at anywhere near room temperature. Dr Bednorz will describe how with the discovery of new classes of superconductors these limitations are gradually being overcome, in the process revolutionizing materials science and engineering.

For his part, Louis Taillefer will lead us to the heart of the quantum world, telling a fantastic story of electrons and scientists, featuring very low temperatures, huge magnetic fields and powerful microscopes. He will describe the faith which scientists place in promising new materials, in particular copper oxides that remain superconducting halfway to room temperature. However, Dr. Taillefer will remind us that scientists still do not know how to increase the quasi-magical force which induces the electrons to form pairs, the process which lies at the root of the phenomenon of superconductivity.

For more information, go to: <http://cern.ch/go/q7Tg>.

# Seminars

## FRIDAY AUGUST 07, 2015

- 10:15** Summer Student Lecture Programme Course **Closing Lecture**  
Main Auditorium
- 10:30** CERN Computing Seminar **Machine Learning for Security** IT  
Amphitheatre
- 11:00** CERN Computing Seminar **Certificate Reputation** IT Amphi-  
theatre
- 11:15** CERN Computing Seminar **Attacking IoT with Software de-  
fined radio** IT Amphitheatre
- 14:00** CERN Computing Seminar **Identifying Application Usage  
within Encrypted Tunnels** IT Amphitheatre

## MONDAY AUGUST 10, 2015

- 17:30** SLAC Summer Institute **43rd SLAC Summer Institute** Kavli  
Auditorium
- 10:15** Summer Student Lecture Programme Course **Beyond the  
Standard Model (5/5)** Main Auditorium
- 11:15** Summer Student Lecture Programme Course **Introduction to  
Cosmology (2/3)** Main Auditorium

## TUESDAY AUGUST 11, 2015

- 09:15** Summer Student Lecture Programme General **Student Session**  
Council Chamber

## WEDNESDAY AUGUST 12, 2015

- 14:30** ISOLDE Seminar **TBA**