

The LHC started up – and DESY was (virtually) there!

The exhibition “Weltmaschine” explains what it’s all about

by *Katrin Voß*

10 September 2008 was the big day: the Large Hadron Collider LHC was switched on at CERN in Geneva. The moment particle physicists in the whole world had been looking forward to excitedly for months proceeded smoothly; at 10:28 already, the first proton beam circulated in the accelerator. At 15:03, a proton beam completed a turn of the LHC in the opposite direction. Cheering resounded throughout the CERN control centre, and everywhere in the world people joined in.

DESY was virtually present, too, as the first particle beam raced around the ring, for its site in Hamburg was one of the locations of the nationwide video press conference that took place in Germany at the same time. Rolf-Dieter Heuer, Joachim Mnich, Kerstin Borrás and Johannes Haller were here on site to answer the questions of the journalists. The other locations were the GSI in Darmstadt, the MPI for Physics in Munich and the BMBF in Berlin; in addition, CERN scientists joined in from the CMS control room at CERN. In total, around 40 journalists attended the press conference at the five locations, and the media coverage on the following days was correspondingly great. Particle physics on the front pages of newspapers and in the main news-casts on TV – a fantastic success!

The next LHC highlight in Germany is scheduled for this autumn: the exhibition “Weltmaschine” (in German and English). It will be on display from 15 October to



Press conference at DESY on the occasion of the start-up of the LHC

16 November in the underground station “Bundestag” in Berlin; admission is free. The aim of the exhibition is to increase the public’s awareness of CERN and the LHC in Germany and to convey the attractiveness and importance of research at the LHC in Germany. Another goal is to illustrate the important role Germany plays in the international particle and nuclear physics community. Main subjects of the exhibition are CERN, the LHC and its detectors, particle physics with special emphasis on LHC physics, the LHC Computing Grid, technology transfer and the worldwide collaboration of particle physicists. Large-scale photo-

graphs on the station platform create an impressive surrounding.

Another important element of the exhibition are the physicists themselves. Scientists who were involved in the development and construction of the LHC and who will carry out research at the LHC in the next years – among them many DESY physicists – will be present during the whole exhibition to answer questions about the LHC and guide the visitors through the exhibition.

INFO

www.weltmaschine.de

DORIS Back to Routine Operation

After a nine-month shutdown, the photon source DORIS III took up user operation again on 22 September. During the shutdown, maintenance work was carried out on the storage ring and some of the beamlines were renovated and expanded in order to improve the scientific measuring possibilities. DORIS will now be at the disposal of the user

community until the Christmas break, which starts on 22 December. User operation will then resume at the end of January 2009.



DIRECTOR'S CORNER

The 10th of September, the day of the first beam in the Large Hadron Collider LHC, was one of this year's true highlights. Everything went like clockwork, the proton beams took their turns around the ring in both directions in no time – a picture-book start worthy of the Guinness Book of Records. Commissioning such a complex facility as the LHC is an enormous challenge, and DESY congratulates CERN and everybody involved in this successful overture for the new world

machine. Nobody had expected that everything could go so smoothly!

For one day (and more), CERN and the LHC made the main headlines in nearly all the newspapers and news broadcasts, the Internet virtually bubbled over. Never has particle physics been so much in the spotlight, and I hope that we were able to convey some of the fascination of our research field to the world at large. The lively, enthusiastic and humorous reports from the journalists

surely helped. Here at DESY, we organised a nationwide video press conference with a live link to the CMS Centre at CERN. The excitement about the first events in the ATLAS and CMS detectors and the news of the first complete turn of the beam could be felt everywhere. I am looking forward to having similar control centres here at DESY soon. The first one will be the "CMS Centre DESY", which is currently being installed in Building 1b and which will allow German CMS

members to take their turn on shifts to monitor the data. Even if setbacks during the start-up of such a complex machine are inevitable, I hope we will soon be able to receive the first data from the LHC here in the Analysis Centre of the Terascale Alliance.

Enthusiastically yours,

Rolf Heuer

A "National Analysis Facility" at DESY

The computer centre is preparing for the first LHC data

by Volker Gülzow

In Hamburg and Zeuthen, DESY jointly operates large computer and data storage systems for the LHC experiments ATLAS, CMS and since recently also LHCb. These systems form the so-called Tier-2 Centre at DESY. It is one of the largest of the approx. 100 such centres distributed all over the world.

According to the layered structure of the LHC Computing Grid, the Tier-0 Centre – CERN – is followed by eleven international Tier-1 Centres for the storage of the raw data and reconstruction. The Tier-2 resources constitute the decisive level for the scientific analysis of the data using Grid tools.

DESY's Tier-2 Centre is used via the

computer Grid by groups from all over the world and thus has an important international visibility. Its operation therefore has to meet specific requirements. The Grid software used is not yet fully mature, however, which has given more than one IT/DV member sleepless nights. For German research groups, additional computers and storage capacity are provided within the Helmholtz Alliance "Physics at the Terascale". This additional computer complex, which is closely connected to the Tier-2, makes up the "National Analysis Facility", or "NAF" for short. It is supported by the German research ministry BMBF and provides the research groups with purely Grid-based accesses and enables

them to work interactively on the systems – a decisive advantage for the analysis of the LHC data.

All in all, this results in an excellent working environment that also benefits other groups such as the ILC researchers. By now, DESY operates a very complex "machine" spanning its two locations, featuring well over 1000 processors and hundreds of terabytes of disk storage – and it will grow even more in future.

DESY and GKSS are jointly organising the Industrial Forum 2008 on materials research. The development and analysis of new materials require ever more sophisticated experimental techniques. Synchrotron radiation opens up numerous perspectives for this research field, for example the non-destructive analysis of components or opport-

unities for automotive applications. On 5 November, experts from science and industry will inform about the current state of research.

Information at: <http://industry.desy.de>

DESY's EU Projects

ERID-Watch

The project ERID-Watch (European Research Infrastructure Development) analyses the cooperation between research and industry in Europe and develops strategies for a more effective cooperation. It focuses on so-called research infrastructures, which make their facilities available for scientific and industrial use and cooperate closely with industry for research and development on new technologies.

Since November 2006, the interfaces with industry in the fields of construction, operation and use of facilities as well as technology transfer and human resources have been compared in over 50 research infrastructures and market analyses carried out. From these, recommendations were made on how to make that cooperation as effective as possible. DESY was one of the six partners of the project, which was funded with nearly one million Euros.

The project will be brought to conclusion this year with a final conference in Prague on 15 and 16 October. All the results and recommendations of the studies carried out within ERID-Watch will be presented there. They will then be made available on the website of the project.

A follow-up project is currently being planned. (cm)

INFO

www.eridwatch.eu



CMS Centre at CERN: a small version of this CMS control room is currently being built at DESY.

Monitoring from afar

The “small” CMS Centre opens its doors at DESY

At CERN, the scientists working on the CMS experiment at the LHC are preparing their detector for the upcoming particle collisions. The CMS detector is controlled from the control room located near the experiment in Cessy in France. The operation and data taking, however, are also monitored at the CMS Centre on the CERN site. From mid-October, a “small” CMS Centre at DESY will support its big brother at CERN.

“Whereas the experiment is controlled from Cessy for security reasons, the data is monitored from the CMS Centre at CERN, LHC@FNAL at Fermilab and the CMS Centre at DESY,” says Günter Eckerlin, project leader for the DESY CMS Centre. This so-called “Data Quality Monitoring” checks whether the complex CMS detector is operating as it should. The premises for the Centre are currently being completed on the first floor of Building 1b: one room with four computer consoles – the CMS Centre at

CERN has 22 such consoles – and a neighbouring conference room for discussions with the CMS colleagues at CERN and FNAL.

Nearly all the monitoring programmes are web-based and run on computers customary at DESY, which means that the operation of CMS could be monitored from anywhere in the world. However, such a dedicated monitoring room has decisive advantages: it enables the CMS researchers in Geneva, Chicago and Hamburg to keep in constant contact via a special audio and video connection. What’s more, “the CMS Centre is meant to be the first contact place for information about the operation of CMS – not only for the scientists concerned, but also for all other DESY staff members or for our visitors,” says Eckerlin. (jde)

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<http://cms.desy.de>

New Head of Analysis Centre

Thomas Schörner-Sadenius is the new head of the Analysis Centre of the Helmholtz Alliance “Physics at the Terascale” at DESY. The particle physicist from the University of Hamburg took over on 1 October from Klaus Mönig, who had led the Centre on an interim basis. The Analysis Centre supports German particle physicists

working on data analyses at the LHC experiments and on the preparations for the ILC. It provides a network of experts, help with practical problems in various areas (Monte Carlo generators, parton distribution functions, statistics) and further training courses for young scientists.



40 years Maria Laach

Anniversary in the Benedictine monastery Maria Laach in the Eifel mountains: for forty years, PhD students of experimental and theoretical particle physics have been learning about latest results and developments in their field. The two-week autumn school features talks by scientists, physics exercises and student reports on their thesis projects. The school, founded in 1969 by DESY's Johann Bienlein and run by Hans Dahmen of Siegen University from 1985, is organised since 1999 by the trio Siggie Bethke (MPI Munich), Thomas Mannel (Siegen University) and Reinhold Rückl (Würzburg University). "Maria Laach has a very good reputation here and abroad because internationally known scientists teach alongside German junior researchers," says organiser Bethke. "The tried concept has been already copied several times." Father Athanasius has taken part in the school for 40 years. (baw)

Repairs required at the LHC

Helium leak during commissioning leads to delay

During commissioning without beam of the final sector of the Large Hadron Collider LHC, an incident occurred on Friday 19 September 2008 resulting in a large helium leak into the tunnel. Preliminary investigations indicate that the most likely cause of the problem was a faulty electrical connection between two magnets. The commissioning was supposed to prepare the LHC for operation at 5 teraelectronvolts. According to a CERN press release from 20 September, a cable connection probably melted at high current leading to mechanical failure. A full investigation is still underway, but it is already clear that the corresponding sector 3-4 will have to be warmed up in

order to replace the faulty magnet. This implies a delay of several months for the further commissioning of the LHC. In a first step, the machine – which is operating at -271° Celsius – has to be warmed up progressively by nearly 300 degrees before repairs can be carried out. Afterwards it has to be cooled down again just as progressively to its operating temperature. This means that the scientists will also have to wait a few months for the first collisions. (baw)

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Podcast from "Welt der Physik"

The German Internet portal www.weltderphysik.de now features its own audio podcast: about three times a month, it presents topical news from the world of physics (in German). Each episode includes a main topic – for example the start of the LHC – complemented by short news and a calendar of selected events from all over Germany.

You will find the podcast on the homepage www.weltderphysik.de or directly as RSS feed at <http://www.weltderphysik.de/podcast>.