

## Same procedure ...

Christmas and New Year are approaching, and the much sought-after DESY Christmas cards are now available at the PR department, building 1. Please note, that as always, there is only a limited number of copies.

## Different procedure

Because of New Year, the January issue of DESY inForm will exceptionally appear on the second Thursday of the month, i.e. on January 11 2007. As of February, DESY inForm will be distributed as usual on the first Thursday of the month.

## "Magic Andy"

Wednesday December 13 is the date of this year's Christmas event: "Magic Andy" will present his show "Magic of Flames & Art of Fire" in the DESY auditorium. Read more about the show on page 2 of DESY inForm.

## New DESY Director

Reinhard Brinkmann will become director of the machine division on July 1 2007. He succeeds Dieter Trines, who is retiring. Brinkmann, at DESY since 1984, is currently leader of the XFEL project group at DESY.

## Director's Corner



*December is the time for a retrospect of what this past year has brought.*

*In today's management jargon progress is expressed in the reaching of milestones. When I look at what you—and thus DESY—have accomplished this year we have good reason to be proud: More than 3000 scientists who come to DESY every year from all over the world are happy about their good data taken at HERA, DORIS and FLASH. The preparations for the PETRA upgrade are well under way. DESY staff have very successfully gained a foothold in the large ATLAS and CMS experiments at the LHC at CERN.*

*An important milestone for the preparation of the XFEL was the approval statement providing the decisive legal basis for the construction and operation of the facility. Closely connected to this is the reconciliation with our neighbors, following our aim to keep the disturbances caused by the construction work to a minimum. The German government and the federal states have secured their funding shares for the construction of the XFEL in their budgets. Last summer, the project team presented all decisive documents for the approval in due time.*

*continued on page 2*

## Tiny Particles Demanding a Great Deal

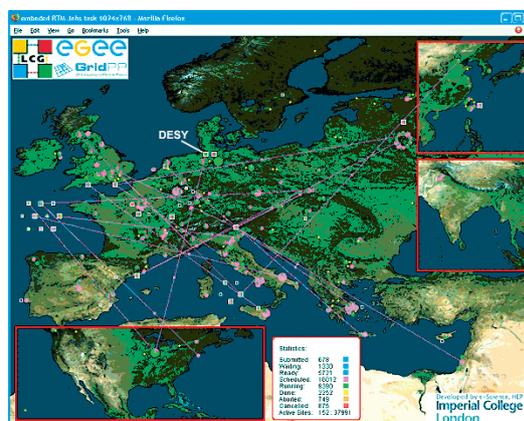
### Computing enters a new era in particle physics

by **Andreas Gellrich**

When the Large Hadron Collider LHC starts taking data at the end of next year, computing will have to cope with a tremendous data flood. Ten petabyte will be recorded each year—that's equivalent to a stack of CDs of 20 kilometers in height.

In order to meet this requirement, the "LHC Computing Grid" (LCG) was set up as a network of computers distributed world-wide.

Within the layered structure of LCG, DESY acts as a Tier-2 centre which provides data and computing power to regional research groups. DESY currently operates some hundred central processing units and around 100 terabyte of disk space in the Grid. Within the framework of the EU project EGEE, the local Grid experts have been supporting the HERA experiments in Grid computing for years. By the beginning of 2007, H1 and ZEUS will have produced more than a



The Grid of the EU project EGEE is fed from resources distributed around the globe

billion Monte Carlo events on the Grid, which proves that the infrastructure works! The resources of the Grid—a term which was introduced in analogy to the electrical power grid—consist of computers, storage devices and the networks and are distributed around the globe, just like power plants. A main building block of the Grid are so-called Virtual Organizations (VO) in which users share distributed computing

resources, obeying well-defined sharing rules. DESY hosts VOs for H1, ZEUS, the ILC and a theory group. These VOs are globally accepted and are supported by many computing

centers world-wide. Particle physics, governed by a huge demand of computing resources, is doing pioneering work which has also become a key technology beyond the mere need for computing power. Apart from bio-informatics and weather and climate research, future research areas with enhanced computing needs will use it—like photon science.

## Progress for the ILC

### Valencia GDE and ECFA Workshop

During the first week of November, the International Linear Collider (ILC) got yet a few steps closer to becoming reality at a joint meeting in Valencia, Spain, of the ECFA study group for the Linear Collider and the ILC's Global Design Effort (GDE). The

GDE is an international team who works on a detailed design for the ILC including international costing, an industrialisation plan and siting analysis. Barry Barish, GDE-Director, said in his closing talk that good progress was made in reducing the cost of

the project. He announced the recent design changes, e.g. using a central damping ring, and a cost and design freeze for November 30. In February the GDE meets in Beijing to publish design and cost of the ILC.

(baw)

# Flying Sparks and Fiery Bangs

## Amazing experiments with “Magic Andy”

Exclusive enlightenment, this is what this year’s Christmas event is all about, organized by the DESY on-site education group. Invited guest is “Magic Andy”, magician and scientist in one person, with his show “Magic of Flames & Art of Fire”.

On Wednesday December 13 at 16 h, watch a great variety of experiments on the mystery of fire in the DESY auditorium. Also your kids will be thrilled. The science show is suited for children of 6 years and older. “Magic Andy” alias Dr.

Andreas Korn-Müller from Dresden knows what he is doing because he has a PhD in chemistry, meaning he is an expert for everything that sparkles, bangs and smokes. His shows how to light a good fire—for example with a “fire beater” or with platinum and hydrogen gas. He also gives explanations of all the effects, lively and easy to



Don’t try this at home: the fiery experiments of Dr. Andreas Korn-Müller, magician and scientist.

understand, so that the magic of flames isn’t extinguished too quickly.

All DESY staff, guests and their families are cordially invited to enjoy the fiery entertainment.

With this bang, the DESY on-site education group says goodbye for the end of this

year. Next year, there will again be a varied program of training courses as well as regular internal and public lectures. Unfortunately, the study trip to CERN is fully booked, but there are plans for another trip in 2008. (tz) Further information only in german: [www.desy.de/fortbildung](http://www.desy.de/fortbildung)

## Director’s Corner

Since then, discussions have been held on an international level to negotiate and determine the funding contributions of other countries, a difficult process. With the support of DESY, the German Ministry for Education and Research is trying to bring these negotiations to a successful close within the coming months.

Needless to say, all this called for a celebration and everybody had a good time at the “Caribbean Night” in September. Nevertheless, we all need a rest period to gather new strength to keep everything going. Hopefully the holiday season will provide an opportunity for this.

I wish you, your family and friends a Merry Christmas, a restful time and a Happy New Year in good health, happiness and luck.

Sincerely yours,  
Albrecht Wagner

# Print Out Your Undulators

## New method makes quick production of 3-D-models possible

Kerstin Haendel and Susann Fuhr get exclusive previews of components of the future PETRA III beamline—and anything else, really. They can look at them from all angles, rotate them, flip them around and zoom in—all with the help of their CAD workstations. CAD stands for computer-aided design, and since last year their stations have also been able to print the component parts with a new 3D-printer. No paper is involved: the printout is a real component. The pictures they had on screen can be sent to a machine that turns them into real, palpable models. “This new acquisition helps us to design better prototypes,” explains Heinrich Münch, head of the ZM1 department. With the mo-

del at hand, the client is much better able to check construction aspects. This is important when the new development is to be mass-produced later by industry. Construction errors can be identified more easily—this saves time and above all cost. Clients prefer to build in real-size models directly. The test on site is an additional step to accelerate the development process. The name “printer” is a little misleading because the state-of-the-art machine has little to do with a standard office machine. Instead of ink, the printer cartridges of the “Dimension SST” contain a thermoplastic synthetic material. A melted thread of this material is pressed through a spinning nozzle, and thus the model grows layer per layer. For



The image sequence shows the construction of a model, including the stabilization substance and the subsequent alkaline bath.

stabilization purposes, the machine adds a kind of cement to instable spots. This substance is later washed out in an alkaline bath and the prototype is finished. More complex constructions require the machine to run overnight.

The machine makes different scales of the model, depending on what the model will be used for. The scaled-down prototype of an undulator, for example, was used by the PETRA III physicists and engineers to make a better assembly plan for the single components. Other real-size models were even able to make the step from prototype to final product—the parts were built in directly. (she)

Contact:

K. Haendel und S. Fuhr

# Sinterklaas, Joulupukki, Weihnachtsmann or Santa Claus

## International DESY colleagues talk about their Christmas traditions



“Santa Claus lives in Finland!” Sisko-Leena Poser is Finnish and should know.

She has even been to Korvainturi, the village where he lives with his wife and his little helpers. For Sisko-Leena Poser snow is a must for Christmas. “We used to go to church on my grandparents’ sleigh, wrapped up in fur and with the horse bells ringing—a pure Christmas feeling. In Finland, father and children pick a tree and then the children decorate it.” On Christmas eve the whole family goes to the sauna, has a big, traditional meal of roast ham, sweet dark bread and rice pudding and then opens their presents. “It’s a very merry feast,” she says.



In the Netherlands, where Ytsen de Boer comes from, children think that “Sinter-

klaas” lives in Spain, not in Finland. “Sinterklaas arrives every year in November by steam boat with his helper Zwarte Piet and his white stallion, and for two weeks children put carrots into their shoes that are replaced overnight by sweets,” he explains. “Then on December 5 it’s the big day. Suddenly after dinner there’s a loud knock on the window and the children find a big bag full of presents.” Christmas itself is more a religious matter in the Netherlands. “We got to choose when we wanted our presents—for Sinterklaas or for Christmas,” remembers Ytsen. “We always chose December 5 because it was earlier!”



Kids in Russia also have a choice: their families either celebrate

Christmas on new year’s eve or on January 7. “The traditional Christmas on January 7 is coming back

into fashion,” says Alexander Femenko. On January 6, the dinner of “kutya”, a traditional dish of wheat, nuts and dried fruit, doesn’t start until the first star comes out. “We always have a nativity scene made by hand from pastry. The figurines are given to visitors and family.” The next morning, the children find presents under their pillow, and families gather with food (and vodka) at relatives’ houses.



Ross Killough from Canada grew up with a mixture of Christmas traditions. “Canada is multi-cultural, so we had advent calendars and celebrated advent Sundays, inspired by Danish and German friends,” says Ross.

The main day is December 25. “We used to hang up our stocking on the 24th, put out milk, cookies and a carrot and tried to stay awake for as long as we could to see the sleigh,

but we never managed ... Then we were allowed to open the presents in our stocking in the morning and then have turkey with all the trimmings.”



Shiraz Habib remembers a wind-up toy robot he got on Christmas.

“I wound it up so much that it broke after a few hours.” Shiraz grew up on Trinidad in a Muslim family with Indian origins.

“But we still celebrated Christmas—my parents preferred that to five complaining children. Mum would make traditional Indian dishes and plum pudding with lots of rum, and we’d spend the day with the whole family.” Presents are given in the morning of December 25. “We also had a Christmas tree, but as there are no fir trees in the Caribbean it was made of plastic.” (baw)

## Science with a Clean Record

### New website online to prevent corruption at DESY

DESY can be proud: there are no recorded instances of corruption in the lab.

However, you can never rule it out completely, because everywhere where money is spent, where several companies battle for orders, there can be corruption. With regard to the upcoming major projects PETRA III and XFEL, DESY has to be aware of the danger.

As a measure to fight corruption, the DESY directorate appointed an expert in corruption prevention two years ago: Christian Glauß, head of the internal audit department D2, holds this

responsible position. Anyone can contact him, e.g. when confronted with a dubious offer or when in doubt about the difference between a normal business connection and bribery. The business law expert Christian Glauß knows all about this matter, also through training in special seminars. Reports and requests will be handled strictly confidentially.

More information on corruption is available on the new internal DESY website dealing about the D2 department. “The best way to fight corruption is prevention, and this can only be achieved with in-

formation,” explains Christian Glauß. The new website also answers the most important questions: What exactly is corruption? What are the effects? What can I do against it?

Christmas is a crucial season for bribes—and their prevention. But don’t worry too much: Accepting small gifts under 10 Euros is perfectly okay. Everything that goes beyond this, however, should be discussed with Christian Glauß. (tz)

Internal website currently in german:  
<http://d2.desy.de>

## News from IT

Did you know that the IT department issues a newsletter full of information for all DESY computer users? It gives tips for PC work and information about existing and planned IT services.

The newsletter is issued quarterly and subscription is possible by email. Moreover, a hard copy is available at UCO and is posted on the notice boards. The past newsletters can be found on the IT website under “News”. This is also the place to subscribe to it. (tz)

IT Newsletter: [www-it.desy.de](http://www-it.desy.de) →  
News → IT Newsletter

## Money lost, Friend found

### Honest finder returns wallet

Professor Janos Hajdu from Uppsala University was in a hurry that morning, so he took a taxi. On his trip to DESY, he was totally absorbed in talking about his research to the taxi driver, a man from Tanzania. The experimental team was already waiting for Professor Hajdu in the FLASH hall when he jumped out of the taxi, paid and grabbed his receipt. Shortly after leaving, the taxi driver noticed the abandoned wallet and immediately returned, to the DESY main gate, to ask for Janos Hajdu. He had found the name on the credit card but there were no telephone numbers or other hints inside the wallet. Only this: cards of an Oxford bank or saying things like Uppsala University or SLAC, Stanford University. The owner seemed to be a modern research migrant. The telephones ran hot at the gate. No entry for



Professor Janos Hajdu had an exciting time at DESY.

Hajdu in the DESY telephone directory. Perhaps a guest scientist? This assumption was a hot trace, but the first name misled the helpers, they were looking for somebody from Poland. Janos Hajdu only became aware of his loss at lunchtime, at the cash point in the canteen. Worried, he went searching on the roads he had walked, on his desk and at the experiment —no wallet anywhere. Then he

remembered the taxi receipt. He found a telephone number on it but his call was answered by an advertising agency for taxi companies. All other investigations on the internet or in Berlin public authorities remained without result. It seemed that the taxi company, including the driver, had vanished into thin air. It was in the afternoon when Professor Hajdu decided to inform his Oxford bank. He was surprised when he was told that the credit card had already been blocked—by the smart taxi driver. He had had this idea at the DESY gate when it became clear that the professor could not be found. He left his name and his normally secret telephone number. Taxi driver and passenger met at Hajdu's hotel where the story had begun in the morning. Happy to have recovered his

wallet, Janos Hajdu asked the man from Tanzania why he never left his telephone number anywhere. The reason: to avoid bullying. Therefore he keeps his number under closure like a treasure. He only bit the bullet for Hajdu. The only way to a happy end in this story and a wonderful early Christmas gift for the scientist. There even was another early present for the Swede. On November 12, the research results of the international research team under the leadership of Professor Hajdu and his Californian colleague Professor Chapman were published in *Nature Physics* online. For the first time, the scientists had been able to take a picture of a sample with an extremely short and intense laser shot before the laser pulse damaged the probe. This new method is called "flash diffractive imaging". (she)

## Does Santa exist?

### A recurring question, scientifically regarded

🦌 No known species of reindeer can fly. But there are 300,000 species of living organisms yet to be classified (most of these are insects and germs) so this does not completely rule out flying reindeer which only Santa has ever seen.

✳️ There are 2 billion children (persons under 18) in the world. But even when Santa handles only the Christian children, it reduces the workload to approximately 378 million. At an average (census) rate of 3.5 children per household, that's 91.8 million homes. One presumes there's at least one good child in each.

✳️ Due to the time zones, Santa has 31 hours of Christmas to work

with, assuming he travels east to west which seems logical. This works out to 822.6 visits per second. This is to say that for each Christian household with good children, Santa has 1/1000th of a second to park, hop out of the sleigh, jump down the chimney, distribute the presents, eat the snacks, get back up the chimney and move on to the next house. Assuming that each of these 91.8 million stops are evenly distributed around the earth, we are now talking about 0.78 miles per household, a total trip of 75.5 million miles, not counting stops to do what most of us must do at least once every 31 hours. This means that Santa's sleigh is

moving at 650 miles per second—a conventional reindeer can run, tops, 15 miles per hour.

✳️ The payload on the sleigh adds another interesting element. Assuming that each child gets nothing more than a medium-sized lego set (2 pounds), the sleigh is carrying 321,300 tons. On land, conventional reindeer can pull no more than 300 pounds. Even granting that "flying reindeer" could pull ten times the normal amount, we need 214,200 reindeer. This increases the payload to 353,430 tons.

🦌 353,000 tons travelling at 650 miles per second create enormous air resistance—this will

heat the reindeer up in the same fashion as spacecraft re-entering the earth's atmosphere. The lead pair of reindeer will absorb 14.3 quintillion joules of energy. In short, the entire reindeer team will burst into flames almost instantaneously. A 250-pound Santa, meanwhile, will be subjected to centrifugal forces 17,500 times would be pinned to the back of his sleigh.

**Conclusion:** Theory seems to rule out Santa's existence. However, we can probably rely on the fact that, as every year, there will be presents under the tree.