

Astroparticle Physics – the European Strategy

Recommendations for projects and future large-scale facilities

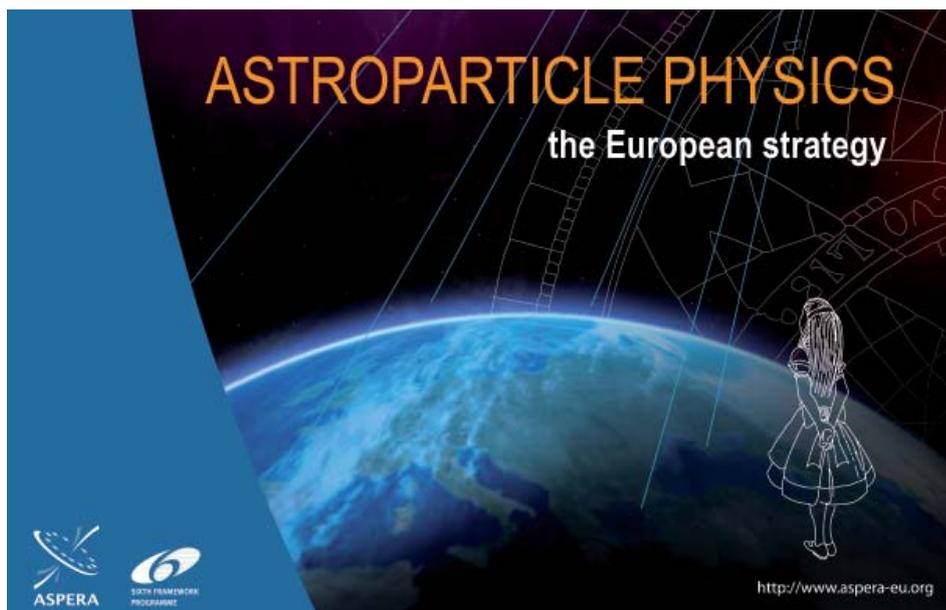
by Christian Spiering

The young research field of astroparticle physics is gaining speed. More and more it features, in journals like Nature and Science. European astroparticle physicists presented a roadmap in Brussels on 29 September for the development of this emergent field at the intersection of particle physics, astronomy and cosmology. Three projects shall investigate the high-energy universe: the first is the Cherenkov Telescope Array (CTA) for high-energy gamma rays. It is based on the experience from the successful gamma ray telescopes H.E.S.S. and MAGIC. Currently it is in a prototype phase, with DESY physicists from Zeuthen already contributing to telescope design and drive systems.

Moreover, the Pierre-Auger-Observatory will be upgraded. In addition to the Argentinean site which observes the southern sky, a future site in Colorado, USA, will survey the northern sky for sources of charged cosmic rays.

A third project, the neutrino detector KM3NeT in the Mediterranean Sea, would complement the Antarctic IceCube towards a full-sky view with high-energy neutrinos. Construction start for all three projects is planned for 2012.

Two additional topics are experiments searching for dark matter and neutrino-less double beta decay. Both the identification of dark matter and the determination of neutrino properties with the help of double beta decay experiments would have fundamental consequences



Detail of the cover page of the new brochure which can be downloaded from the website (see below).

for cosmology. Priority decisions are to be taken between 2010 and 2013, taking into account the results of the projects which currently are under construction.

The construction of the last two large-scale projects – a huge underground detector for proton decay searches and low-energy neutrino astrophysics, and an underground gravitational wave observatory “E.T.” (Einstein Telescope) – would start only mid or end of the next decade.

Astroparticle physicists may well realise this programme by priority setting, appropriate phasing and stretching and international cost sharing – provided the European countries will spend in the

next decade one and a half times the sum they had spent in the past decade for astroparticle physics. This may not be moderate, but given the enormous discovery potential it seems not at all utopic.

INFO

Christian Spiering, Chair of the ASPERA Roadmap Committee
www.aspera-eu.org

Helmut Dosch to be new DESY Director

Professor Helmut Dosch will become the new Chair of the DESY Directorate. Solid-state physicist Helmut Dosch is at present Director of the Max Planck Institute for Metals Research and professor at the University in Stuttgart. Dosch, who also accepted a chair at the University of Hamburg, will replace Albrecht Wagner who will retire on 1 March 2009.

Helmut Dosch is no unknown person at DESY. He has already been a member of the DESY Scientific Council and, as surveyor of the German Council of Science and Humanities, he evaluated the TESLA/XFEL project which later developed into the European X-ray laser project XFEL and the International Linear Collider ILC.



DIRECTOR'S CORNER

In its autumn meeting, the Administrative Council discussed the current developments at DESY, including DORIS and FLASH operation, construction of PETRA III, the developments in particle and astroparticle physics, XFEL implementation and the preparation of the programme evaluation in the Helmholtz Association. High compliments were paid to the PETRA III project team which, shortly before commissioning, has stayed within budget and schedule. The Administrative

Council was also pleased about the success of the economic measures that will cut the liabilities of the past years according to schedule in 2008.

The approved 2009 budget plan leaves only little flexibility. DESY's claim for cost-covering funding of the large facilities has generally been accepted by politics. The search for a solution is ongoing.

Next year, the Helmholtz evaluation will find a stable funding base for our programmes in the coming five

years. With the support of the funding agencies, we are confident to manage to close the funding gap as of 2010, at least proportionally. This discussion is part of the negotiations with the new directorate which could take up work in the first quarter of 2009.

The Administrative Council plans to authorise DESY to sign the convention for the XFEL construction in mid-November 2008. This will be an important cornerstone for the realisation of the XFEL.

In spite of economisation measures many things have been initiated in 2008 for the coming years. This is a good occasion to express my gratitude to all those involved. There are considerable tasks lying ahead of us. This means exciting times that will challenge us.

Best regards,
Christian Scherf

Economising sensibly

“Open Space” put into practice

Time, money, energy and raw materials – these are valuable resources which DESY wants to use most efficiently. Corresponding proposals had been compiled by about 100 DESY staff members within the framework of an “Open Space” meeting. On this basis, the directorate has assigned specific tasks which are currently being worked out. At DESY, there are various saving possibilities and various planned measures as well – and every DESY person can help: how to save effectively in one's own working environment is described in a leaflet to be distributed at the same time with this DESY inForm issue. Two additional leaflets are in preparation. One of it deals with spon-

soring, the other one shows how to plan and carry out meetings in an efficient and time-saving way. More items on the saving list are for example discounts for large orders or alternative models for the reduction of energy costs. The DESY vehicle pool is also subject to close scrutiny: vehicles are to be used more efficiently and the total stock is to be reduced. Successful results have already come out of the inspection of internal transportation, saving a six-digit sum.

Time, money and nerves may also be saved with workflow optimisation. Several activities are available, for example a better interchange of the DESY development sectors. The current status is accessible online.

Anyone who wants to contribute ideas to optimise the utilisation of resources or to make the operations flow more efficient is welcome to turn these in to the DESY employee suggestion scheme. (uw)

INFO

www.desy.de/verborgene-schaetze

Climate Change in the Spotlight

Climate change is quite present in the media and in politics. However, to which extent is it possible to presume a climate change and negative or positive effects? This will be the topic of meteorologist Christiana Lefebvre in her lecture “Climate Change in Germany and World-wide” (in German) on 12 November at 7 pm in the auditorium.

Renovation of Building 1

Complete refurbishment of building 1 will start in 2009 with special funds of the Helmholtz Association. Windows, façade and roof will be modernised in a three-year construction phase. The electrical installation and the heating system will be re-engineered. At the end there will be additional office space because building 1e gains another floor.

DESY's EU Projects

Flavianet

by Rainer Sommer

The EU project is supposed to help understand some of the most fundamental coherences in particle physics. Where do the masses of elementary particles like the electron, muon and quarks, and their so called mixings come from? And why, in fact, are there several families of these particles? The precise study of these questions requires an intense interaction of new experiments, for example the LHCb at the LHC, and new theoretical analyses. Flavianet links research groups with expertise in different theoretical approaches and experimental physicists. With a funding volume of nearly 3,2 million Euros for four years, research centres in 13 countries have organised themselves into 11 network nodes. The overall coordination of the project, planned for a period until 2010, is carried out by the University of Valencia in Spain. There are two German nodes; one of them – Germany North – will be coordinated by DESY in Zeuthen. DESY contributes its expertise in the simulation of lattice quantum chromodynamics to the network and conducts the corresponding work group. The training of a new generation of flavour physicists is one of the main aspects of the network. Two junior scientists work at Zeuthen.

INFO

Flavianet website
<http://ifc.uv.es/flavianet>



After their successful session, the participants of the 19th ISC meeting were all smiles.

European XFEL GmbH

Steering committee agrees on convention texts

by Petra Folkerts

On the morning of 22 September, the participants of the 19th meeting of the International Steering Committee (ISC) looked solemn and tense. At lunchtime however, they were all relieved and smiling when they met for the group photo. After another intense round of discussions, they had finally adopted the contents of the intergovernmental convention for the construction and operation of the European XFEL, the European X-ray free-electron laser. This had really been hard work because all the particulars had to be elaborated at length and agreed on by 14 countries with very different framework requirements. It took several meetings of the ISC and its subcommittees to reach the agreement. The next step will now be the formal preparation of the signing of the convention, including the translation of the comprehensive 40-page English text into six other languages. If all goes accord-

ing to plan, high-ranking government officials of the 13 foreign countries involved will join German federal research minister Dr. Annette Schavan in Berlin in early 2009 to sign the convention. The European XFEL GmbH, the limited liability company that will be responsible for the construction and operation of the European X-ray laser facility, could be established a few weeks afterwards.

Activities will start on all three construction sites beginning of 2009. The access road "Holzkoppel" leading to the Schenefeld site has already been upgraded to accommodate the upcoming lorry traffic, one crossroads is currently being repaired, and other measures for the preparation of the three construction sites are impending.

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www.xfel.eu

Cross of Merit for Jochen Schneider

On 6 October 2008, Federal President Horst Köhler awarded long-time DESY research director Jochen Schneider the Federal Officer's Cross of the Order of Merit. Schneider was honoured for his contributions to make DESY one of the leading photon science centres in the world. From 1993 on, he headed HASYLAB and from

2000 to 2007 he was director in charge of photon science at DESY. During this period, the free-electron laser FLASH had come into operation and the foundation stones have been laid for the future projects PETRA III and European XFEL. Beginning of this year, Schneider went to SLAC in Stanford, California.



Entrance to the Weltmaschine exhibition in Berlin

Weltmaschine Exhibition in Berlin

More than 10000 visitors go underground for LHC exhibition

by *Katrin Voß*

More than 10 000 visitors in ten days – this is the current record of the Weltmaschine exhibition in Berlin’s underground station “Bundestag”. The exhibition, inaugurated by Federal Minister of Science Annette Schavan, CERN Director General Robert Aymar and DESY Research Director Rolf-Dieter Heuer, is open for the general public since 15 October. Until 16 November, visitors can learn about the LHC, the detectors ATLAS, CMS, LHCb, ALICE as well as LHC physics.

Particularly the guided tours, offered several times daily by physicists from all over Germany and from CERN, are very appealing to the visitors. One of numerous entries in the guest book reads “If all physics teachers would

explain things as well as the exhibition guides do, more young people would study physics!” Most visitors are this enthusiastic. In addition to the tours for the general public, school classes have the opportunity to make tour reservations. Already before the exhibition’s opening day these tours were booked out.

On 14 November, there will be a teachers’ training course dealing with “The smallest particles and greatest mysteries in the universe,” including an exhibition tour at the end. More than 100 teachers from all over Germany will take the opportunity to learn more about particle physics.

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www.weltmaschine.de

Sensitive Eye

For the first time, the MAGIC telescope “sees” pulsed gamma-rays of a neutron star in the Crab Nebula. The MAGIC collaboration, with the participation of Elisa Bernardini’s young researchers’ group from Zeuthen, published the results in *Science* online magazine on 16 October. The neutron star powers the famous Crab Nebula. It is located in the constellation of Taurus with a distance to Earth of around 6000 light years. Due to an upgrade of the trigger electronics, the detection sensitivity now has a precision that allowed MAGIC to measure pulsed gamma-rays of more than 25 Giga-electronvolts (GeV). The mechanism of this electromagnetic radiation is an open fundamental question. Previous models predict that the energy spectrum drops off sharply between a few GeV and a few tens of GeV. However, the new results of MAGIC reveal that the drop-off in the emitted radiation occurs at relatively high energies, thus reducing the possible models. (*she*)

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Jentschke Lecture

This year’s Jentschke Lecture on 4 December will be held by Helmut Dosch, the DESY Director General to-be. He will give a talk about “Grand Challenges for Megafacilities”. The lecture in memory of DESY founder Professor Dr. Willibald Jentschke is given in English at 5 p.m. in the auditorium.

Emergency Address

Just one click away: phone number and location plan of the DESY medical service are now in the DESY internet. Moreover, this website informs about tasks and services of the surgery and includes a list of medical specialists in the neighbourhood of DESY. Website in German: www.desy.de →Info and Services→General Services