

News from the Laboratory

The news from the laboratory was presented by Helmut Dosch and Joachim Mnich. Although the final report is yet to come, the laboratory informally received positive feedback from the review committee for the proposals on particle and astroparticle physics of the second five-year cycle within the Helmholtz Association for the Program Oriented Funding (PoF) covering the period between 2010 and 2014. The proposal was submitted in November, 2008 and reviewed in February 2009. On April 16th, beam was stored in PETRA III. By the end of this year, PETRA III will be operating for users. FLASH operation for photon science and machine development is running nicely, including an ILC dedicated high current machine study run. State of Hamburg launched research support programs to prepare for nation-wide Excellence Initiatives.

HERA Experiments: H1, ZEUS, and HERMES

The H1, ZEUS and HERMES experiments are at their peak in harvesting physics from the HERA data. The importance of HERA results for other communities, especially LHC, becomes more and more visible. The PRC congratulates for the continuous production and timely publication of high quality physics results in accordance with the publication schedule, and for the visibility of the collaborations on conferences. The PRC also congratulates the H1 and ZEUS collaborations for the progress towards publication of combined analysis results. In the ZEUS collaboration, the PRC has concern on its core computing support for easy access to computing power for analysis and simulation. Progress on the analysis of the HERMES data with the recoil detector is clearly visible, but there is some concern that the final data productions become available relatively late and decreasing person-power might hinder to completely harvest the physics results of this dataset. The collaboration is especially encouraged to publish technical papers on the recoil detector as an enormous effort went into building it.

The PRC notes that it is challenging to motivate institutes to remain involved in analyses of HERA data. In this context, the PRC notes that Eastern Europeans have been providing significant resources and additional financial support for them would be of importance. The PRC supports the active contribution of HERA experiments to development of long term data preservation strategies. The PRC thanks for the laboratory's high level of support for the collaborations to guarantee excellent physics results and publications, and recommends their continuous support in the coming years. The PRC also recommends that the laboratory and the collaborations help experiments' critical collaborators to be visible in the particle physics community.

It would be desirable for the next PRC to see a summary of the key physics results that HERA experiments have published and the priority for the remaining high impact papers. The PRC strongly recommends the polarization task team to present a solid result of the polarization at the next PRC meeting, which can be officially used by various electroweak measurements at HERA.

LHC

The PRC acknowledges that the DESY LHC groups have made significant contributions to the ATLAS and CMS experiments, and have very good and fruitful collaboration with local universities in Hamburg and Berlin. Both groups have been taking visible responsibilities for detector and trigger commissioning and operation. The CMS group has worked out a pragmatic solution for the PMT readout of the CASTOR calorimeter which had been found to be exposed to unexpectedly large magnetic stray fields. Both groups have attracted many young postdocs and Ph.D. students. As the time for first collisions approaches, both groups have strong emphasis on physics analysis of the first data. In addition to Z, QCD, and Top physics, the groups are starting new attractive activities in SUSY and Higgs searches. The PRC encourages a close collaboration of the DESY groups in these activities in order to maximize the impact and visibility within the Physics Working Groups of the collaborations. Both ATLAS and CMS groups are preparing for participation for sLHC, the luminosity upgrade of LHC. The PRC encourages the participation to these upgrades within the Helmholtz Alliance. The PRC recognizes that both groups need DESY scientists who could coordinate these upgrade efforts. During the LHC running periods, the groups would need more travel support in order to achieve their responsibilities in operations. The PRC acknowledges the groups' efforts on outreach programs such as the LHC exhibition (Berlin October 2008, now traveling exhibition).

The PRC would like to get a report on the activities in the Analysis Center at the next PRC meeting.

ILC

The PRC congratulates the DESY ILC team for continued high levels of critical contributions for ILC accelerator and detector development. In the accelerator development, the XFEL experience will be of great value as for ILC cavity production (30 cavities to be built for the ILC-HighGrade project; successful identification and association of weld defects and impurities leading to quenches), and FLASH with ILC-like beam parameters will provide important operational know how. The role of DESY in these regards has been well recognized by the ILC community. In detector development, DESY has been strongly involved in R&D collaborations such as CALICE, LC-TPC, and FCAL, and has provided strong leadership in developing an ILC detector concept, in producing the LOI with detector optimization, and in benchmark physics studies. The PRC notes that the DESY group would need a minimal level of engineering support for work on

the detector concept in the TDP Phase II. The PRC recommends that the DESY ILC team maintains strong involvement in ILC accelerator and detector developments and exploits connection in detector development between ILC and other projects such as sLHC and XFEL. The PRC congratulates the ILC team for engaging young physicists in ILC detector development as part of “hands-on” education. The PRC encourages the ILC team to maintain contacts with the CERN community developing the CLIC project.

Astroparticle physics

The astroparticle physics activities of DESY were not formally reviewed since most experts were unavailable due to an IceCube collaboration meeting in Madison, U.S. The PRC was nevertheless impressed by the overview given by Christian Spiering. IceCube installation has again been very successful in the last season with a new record of 19 strings deployed. A variety of interesting physics results have been obtained from analysis of the data taken with the partial IceCube detector where DESY continued to be a major contributor. The DESY IceCube group is also successfully pursuing the multi-messenger program in collaboration with MAGIC and has contributed to the camera hardware of the second telescope of MAGIC, currently being in the commissioning phase on La Palma. The CTA activity has been steeply ramped up in the last months with emphasis in the areas of prototype telescope construction, array control and operation, as well as simulation work for trigger and timing studies. The PRC congratulates the astroparticle physics groups for their achievements. On the next PRC meeting in November, a detailed report on the CTA activities as well as a presentation of the results from the test measurements for acoustic neutrino detection (SPATS) are expected.

Theory

The DESY theory group maintains a core effort in a broad range of topics that are main stream in the fields of high energy physics and cosmology. This includes four main thrusts: i) Collider physics in connection with HERA, LHC and a future prospective ILC as well as B factories, ii) Lattice Gauge Theory playing an important role in developing advanced methods for non-perturbative field theories, iii) particle cosmology with a leading role in developing ideas to explain matter-antimatter asymmetry and dark matter, iv) string theory with possible connections to strongly coupled gauge theories and cosmology. The PRC recognizes the efforts of the DESY HH theory group to re-establish leadership in the phenomenology/collider physics thrust after the retirement of Professor Zerwas. The PRC gives full support to this endeavor which is of crucial importance in the starting LHC era, and hopes to hear about significant progress on these efforts in the next PRC meeting in November. The DESY theory group, both in HH and Zeuthen, have programs which go in line with the laboratory's experimental initiatives. The PRC encourages strong connections between the Hamburg and Zeuthen theory groups. The PRC, furthermore, supports the development of a

proposed centre for Theoretical Physics and Mathematics with Hamburg University as part of a new particle physics cluster in Hamburg. With the LHC and many new experiments in the cosmology frontier and promising exciting developments in the coming years, the intellectual leadership of the DESY theory group as a whole is of unique value to the German physics community. The PRC congratulates the theory group for its scientific achievements, the efforts in the education of students and the successful mentoring of postdoctoral fellows, as well as for the strong involvement with local universities.

ALPS

We congratulate the ALPS collaboration for the successful installation of the first light-shining-through-a-wall experiment with an optical resonator. Although time scale has slipped by several months compared to planning presented in October 2008, prospects for delivering world-leading result are good. ALPS appears to be ready to make a competitive measurement this year. The PRC recommends that the collaboration focuses on completing this year's experiment and getting the result out.

At the next meeting, the PRC hopes to hear physics results from this year's running and the resourced-loaded plan for the next generation of experiments.

OLYMPUS

The goal of the OLYMPUS experiment is to determine the contribution of two photon exchange processes and to resolve the existing discrepancy measuring the ratio of the electric to magnetic form factors using either a Rosenbluth separation or a recoil polarization measurement technique. The PRC has been strongly supporting the physics case of this experiment and the PRC acknowledges that with both intense electron and positron beams, DORIS has a unique position for this experiment. The PRC acknowledges that the OLYMPUS collaboration has worked out the installation scenario with DESY and established a first draft of commissioning and data taking schedule. The collaboration has a limited time window to execute this experiment. The PRC notes that funding from the US and the firm commitment from the collaboration, in particular, the commitment from German groups, in a timely manner is critical to start the experiment. A decision on the experiment is only possible after the US funding decision, and when well-defined in-kind contributions from other countries and a firm commitment of all participating institutions are offered. The PRC will have a conference call on Friday, June 12th to discuss the development in these aspects. The PRC requests the collaboration to provide materials to demonstrate that each sub-project can be successfully executed on time and on budget by Monday, June 8th. The materials include i) the status of the US funding, ii) the dedicated person-power (names of people and fractions of their efforts on this project) for each sub project, iii) the installation process with possible backup plans, and iv) a commissioning strategy robust enough for timely completion.