

December 31, 2011

**Dear Colleagues:**

As the year 2011 is coming to a close it is fitting to take a look back at some of the events we all have experienced together.

I like to begin by welcoming the new members to the CLAS/CLAS12 collaboration. They have made the collaboration stronger this past year. The most recent collaboration meeting had about 130 registered participants, one of the largest meetings since we kept a record of the participation. The Hall B collaboration at large had a good harvest of published/accepted papers in refereed journals, including 7 collaboration papers and 4 papers involving higher-level analysis by individuals or small groups. Several more have been submitted for publication. They span the physics spectrum from nuclear interactions, spectroscopy, and deeply virtual processes. Another measure of success is the 122 talks presented at conference and workshops, many of them given by graduate students and postdocs. We added five scientists to the Hall B staff in support of the CLAS12 project and the science program for the 12 GeV upgrade.

**The 6 GeV program:**

In course of the year we continued our experimental program with two major run groups. The 2-photon-exchange experiment eg5-TPE was completed last spring. This is the first experiment that uses a mixed electron-positron beam to directly measure the 2-photon contributions to the elastic electron-proton cross section. It required a very large effort in simulations and installation work to optimize the setup and get the experiment ready for operation.

The hardware of the new HDIce In-beam-cryostat (IBC) was installed in April 2011 and many components were commissioned. A piece of solder that blocked the liquid He flow in one of the cooling capillaries prevented the cryostat from cooling down to the 50mK of temperature, where the target polarization can be kept frozen over long periods of time. The cryostat was fixed later in the HDIce lab and easily cooled down to 35mK, which amounts to a major success! The six-month shut down from May through November was spent overhauling many of the drift chambers in all 6 sectors of CLAS in preparation for the final run of the 6 GeV era. G14 uses HD as a polarized neutron target. Together with the series of previous photon runs, G14 will complete the search for un-discovered excited states of the nucleon. The HDIce IBC was re-installed in October and a polarized target sample was successfully transferred from the HDIce Lab. It has been operating in the photon beams for the past month.

The Hall B technical team deserves much of the credit for keeping Hall B in good conditions and ready for experimentation. They have done a marvelous job in maintaining CLAS detectors and carrying out design and complex installation tasks for the TPE and G14 experiments, and have done this in the most professional way.

**The 12 GeV Upgrade:**

The collaboration has laid the foundation for an exciting physics program with 15 approved experiments to which the PAC assigned 1,231 days of beam time, with 948 days of beam time receiving scientific ratings of A and A-. In addition, three experiments were conditionally approved with requested beam time of 293 days. Several approved experiments require additions to the base equipment, such as polarized targets, micromegas tracking detectors, detection of neutrons at large scattering angles, and a forward tagging system. Moreover, the detection of high-energy charged

kaons in CLAS12 is currently insufficient and needs improvement by adding a RICH detector. Several European groups in the collaboration have joined into initiatives to add equipment to accommodate these additional requirements. An agreement has been reached with CEA/IRFU about the construction of the barrel and forward Micromegas trackers for the Central Detector, and prototyping effort is underway for all of the new detector systems. These are important additions to CLAS12 and require cooperation of many groups to develop the detectors and raise the necessary funds. They also reflect a full involvement of international groups into defining the future directions of research with CLAS12.

Thanks to the strong commitment of the engineers and designers, the Hall B detector upgrade with CLAS12 had a successful year 2011. All detector systems are now in full construction mode underway at seven Universities and laboratories. Three of the six region 2 drift chambers have been completed. One of the region 1 chambers is fully strung and the second one is being strung. The first of the region 3 chambers has been assembled and stringing will begin in January. One of the PCAL sectors has been completely stacked, and the second one is nearly done. The mirror production for the HTCC is well underway, and the first SVT module has been assembled and is being tested. The FTOF construction is well advanced, and CTOF construction is beginning this year.

Besides this great progress on the detector construction, we had a major set back. The contract for the construction of the two superconducting magnets for CLAS12 has been terminated with our vendor in California. Project management is working on a new plan that involves fabricating the magnets at JLab and at other DOE institutions.

#### **Looking forward to 2012:**

With the G14-HD experiment we still have an important experimental program to complete in the coming year. During the past several years we have collected a treasure trove of high quality data that are being analyzed and form the basis of many PhD theses. Extracting the physics from these data will keep many of us busy for years to come.

As for the 12 GeV upgrade, developing a new construction plan for the CLAS12 Torus and Solenoid magnets is the single most important task we are working very hard on resolving to keep the project on schedule.

CLAS12 will play an increasingly important role in our activities in 2012. Construction and testing of detector component are in full swing at several institutions. They provide excellent opportunities for new postdocs and students to be fully involved in the preparation of the 12 GeV program. The development of the software for the calibration and commissioning of CLAS12 and for the full event reconstruction is becoming a pressing project and has high visibility at DOE. We will have a software review for CLAS12 in the spring of this year, where we need to demonstrate that we have a well-developed plan for the software architecture and for all its components.

Let us all work together to make sure 2012 will be another great year for the ongoing 6 GeV program and for our 12 GeV future together!

I wish you all a peaceful and successful year 2012.



(Volker Burkert)