FRIDAY FLYER – JULY 6, 2012

Something to share: An interesting research project or kudos for a student, teacher or mentor? Contact Kris Whelan.

CENTER SPOTLIGHT: Brookhaven National Lababoratory/ Stony Brook University/Columbia University

Contact Mentor Helio Takai to learn how to support teachers in building HEP "gadgets" for their classrooms.

Helio says, " . . . centers have their own life. The most important aspect of centers should be to have fun learning and exercising their creativity. It is important to have motivated teachers and scientists about what they do. QuarkNet is a two-way street. Physicists work with teachers because we want to show and discuss the exciting science we do. In return, I feel like I've learned so much more about how to properly communicate with people and explain what I do in a form that people can understand."

Firm believers in having part of their meetings dedicated to "make and take," teachers have developed lots of classroom gadgets—big and small. For example, they built an experiment to measure the muon magnetic moment, crafted a thermos bottle Cerenkov detector, created Cosmic Chris to explain cosmic rays to students, built cloud chambers with magnetic fields and more. In addition, the center is big on field trips and tours. Teachers tour BNL every year, and have toured the research labs of both the American Museum of Natural History and the Metropolitan Museum. They went to the Pajama Party at Fermilab for the LHC startup and had a field trip to the cosmic ray detector in Delta, Utah. Helio plans "anything that connects science to the real world, and in particular particle or accelerator physics." The proximity to New York allowed the teachers to participate as a group in an event to promote the ATLAS book, as well as a workshop during the PAC2010 accelerator conference. They recently went to a special presentation of QED (about Richard Feynman). The group has spawned other initiatives. The biggest one is called Teslamania—a physics demonstration show that is organized by teachers in the center. Another successful initiative has been the implementation of Masterclass@School with a virtual visit to ATLAS.

The center has a healthy student research program, encouraging them to develop original projects. This year, students are working on a small portable cosmic ray detector while others are analyzing five years of cosmic ray data acquired in the MARIACHI experiment. They follow the students over the years and have found that the majority of students that participated in research actually start undergraduate research as freshmen, not all in physics, but they do some kind of research.

NEWS FROM QUARKNET CENTRAL- Support we can provide for our centers?
QuarkNet can provide workshops led by staff teachers or fellows. Topics include datasets from the cosmic rays detectors, CMS and LIGO, Teaching and Learning. QuarkNet Central begins collecting budget requests for each center in early winter. The budget is based on the number of teachers who attended the previous summer session. Some mentors request additional teachers. If a center wishes to add a field trip, develop a "make and take" workshop, or send a teacher to present at a professional meeting, they may request supplemental funding. Some centers also receive financial support from their physics departments or other funding.

PHYSICS EXPERIMENT ROUNDUP:
Did you stay up for the big announcement from CERN in the very early morning of July 4?

The announcement of Higgs boson candidates had many URLs. One of the main things to understand is that although this is very exciting, there is more work to do. Both the CMS and ATLAS scientists who presented the findings stressed the need for more data. Think about having a histogram with only five data points. Now multiply the number of data points by 100, 1,000 or 10,000. Not only would the mode be better defined, but also the conclusions reached by the researchers would be better supported. So, there is exciting evidence for the Higgs (at or around the predicted value of 125 GeV), but much more data is needed to verify the results.

Find more information at these websites:
CERN Bulletin, the official press release
http://cdsweb.cern.ch/journal/CERNBulletin/2012/28/News%20Articles/1459454?ln=en
Quantum Diaries
http://www.quantumdiaries.org/2012/07/05/new-boson-could-pave-the-way-towards-new-discoveries/
(QD has bloggers who gave a minute-by-minute account of the conference.)
USLHC, a collection of articles about the Higgs published in numerous newspapers and on websites
http://www.uslhc.us/News
USLHC Teachers and Students has a Higgs candidate as the event of the week http://uslhc.us/Teachers_and_Students
Video recording of teachers meeting with Peter Higgs, before the official announcement
http://youtu.be/TvV9xSr0UpU
(Courtesy of Paul de Haas, an HST2012 participant from the Netherlands)

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