

FRIDAY FLYER – AUGUST 31, 2012

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

CENTER SPOTLIGHT: University of Hawai'i at Manoa - <http://www.phys.hawaii.edu/~quarknet/>

Contact Mike Jones for ideas on how to recruit teachers from areas far removed from a center.

You may not be aware that we have centers on two islands. Puerto Rico has a center in Mayaguez (stay tuned next week) and the University of Hawai'i at Manoa has a center on Oahu. One of the unique challenges to our Hawai'i center is the recruitment of teachers. The school district of Hawaii actually includes all the Hawaiian Islands. The Hawai'i Department of Education is ranked only behind districts in Alaska in geographic size. Combining that with decreased budgets and cost-cutting measures such as "Furlough Fridays," it becomes a challenge to recruit and retain QuarkNet teachers. Mike Jones has been able to maintain a small, yet active, group of teachers. The UH QuarkNet Center has a core of teachers who have been participants since the first year, 2003. This center, rather than meet for five days in the summer, has elected to spread their meetings throughout the year. The center offers new teacher workshops to recruit more members. All but one of the teachers is located on Oahu. Keith Imada teaches on Maui and is in charge of our highest-altitude cosmic ray detector. Currently being run at sea level in Maui High School, this detector had been located at an elevation of 10,000 ft. at the summit of Haleakala for a several months. After further testing, they plan to move it back to the summit. Mike Jones has taken an active role to ensure the high quality of data being produced by Hawai'i's detectors. He has helped developers troubleshoot both the hardware and software at his teachers' schools. This year, Mike and his teachers will be piloting a cosmic ray masterclass to be held at Brigham Young University-Hawai'i. Mike and BYUH physicist Mike Weber will be hosting a group of students from nearby Kahuku High School. They plan to run the masterclass in October with the possibility of repeating it each succeeding October. Stay tuned for the results!

News from QuarkNet Central

Texas school learns a powerful lesson

When the P30CW5 photomultiplier module (see Friday Flyer, August 3, 2012 article) was selected as the QuarkNet PMT, it was necessary to create a way to distribute power to all four muon counters in the detector kit and send a control voltage at the same time. This challenge was given to a group of physics students at Kempner High School in Sugar Land, Texas being taught by Nancy Cashiola. They produced some prototypes and a final design for a power distribution unit (PDU) that is still being used today. A small circuit board design using a voltage regulator takes 5 VDC power and creates the range of 0.3 V to 1.8 V needed to control the sensitivity of the PMT. The team also designed the box that houses the circuit board and all the test points, the variable potentiometers and the cable connections. For three years, students in Kempner's physics classes built PDUs, giving them a real and inspiring connection to the QuarkNet project. In fact, the entire process from idea to product mirrored the way physicists work on the big experiments. Teams of students designed two prototypes that were presented to the entire group. The designs were voted upon, and then implemented. Each team (design, construction, quality control, etc.) worked under project managers such that the final product functioned correctly. Mass production of PDUs is now done at Fermilab, with only one change—a resettable fuse put on the circuit board.

Physics Experiment Roundup:

Pierre Auger Observatory tests particle knowledge beyond reach of LHC

<http://www.symmetrymagazine.org/breaking/2012/08/27/pierre-auger-observatory-tests-particle-knowledge-beyond-reach-of-lhc/> Do you have a cosmic ray detector in your classroom? Take a

look at this article talking about one of the BIG cosmic ray experiments. Your students can even go

to the Auger website (<http://www.auger.org>) and look at real data.

Staff Teachers

Ken Cecire, kcecire@nd.edu

Jordan, jordant@fnal.gov

Bob Peterson, rspete@fnal.gov Tom

Kris Whelan, kkwhelan@uw.edu