Friday Flyer - June 29, 2012
Something to share: an interesting research project or kudos for a student, teacher or mentor? Contact Kris Whelan.

CENTER SPOTLIGHT: Ole Miss (University of Mississippi)
http://www.phy.olemiss.edu/HEP/QuarkNet/

For tips on keeping teachers involved in a rural program, contact Lucien Cremaldi.

Ole Miss keeps things fresh by scheduling field trips to HEP facilities such as Fermilab, Brookhaven and SLAC. The program usually runs two to three days in the summer. This summer the workshop topics were using the new LIGO e-Lab and analyzing bubble chamber photos. They have included students in workshops on cosmic ray detectors and LHC simulations. Ole Miss has also been an active participant in masterclasses. To maintain such an active center in a rural setting, the Ole Miss mentors offer three bits of advice: meet frequently, place professional development of teachers as a high priority and involve students. The Ole Miss center is also somewhat unique because most of the high-energy group is involved in the project including Lucien Cremaldi who is working with the teachers on taking measurements associated with the Auger Project. The QuarkNet center at Ole Miss began in 2001. One of few programs in the Deep South, and in a very rural setting, they have supported an average of seven teachers each year.

News from QuarkNet Central
Getting to Know Your Detector
Another important part of the muon counter is the photomultiplier tube (PMT) that turns photons into electrons, providing an electrical current that we can measure. The PMT used in our counters is inside what is called a model P30CW5 "photomultiplier module" made by Sens-Tech Ltd. in the UK. This module combines a photomultiplier tube with a high-voltage source inside a protective cylinder, thus protecting the user from any shocking experiences. All this module needs is a 5-volt DC source for power and a variable control voltage on the control lead from 0.3 volts to 1.8 volts DC. The PMT is sensitive to light from 280 to 630 nm in wavelength, which is a good match to the output of the plastic scintillator that emits light from 400 to 500 nm in wavelength, peaking at 425 nm. A special optical couplant (silicone grease) is used to eliminate the air gap between the window on the PMT and the cookie on the scintillator, making for much better transmission of the small amount of light energy created by any muon passing through the scintillator. Inside the PMT, photons of light entering its window cause a cascade of electrons down multiple dynodes, creating a detectable current or signal output. This is created by the "photoelectric effect." Connectors are added to the signal cable and power cable coming out of the module so 50-foot-long extension cables allow placement of the counters in a wide shower array. A four-way power and control box, the power distribution unit (PDU), provides the 5 volts of power and variable voltage to each of the four counters in our kit. The signal cables connect to the four input channels on the DAQ, where the signal from each photomultiplier module is monitored, timed and analyzed.

Physics Experiment Roundup: EXCITING NEWS!
"To be, or not to be? That is the question," and we're getting closer to an answer. CERN will give an update on Higgs search as curtain raiser to ICHEP conference.

For information and URLs of the press conference and webcast, see Interactions.org: http://www.interactions.org/cms/?pid=1031844

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