

Summer QuarkNet Program at Syracuse University

The Syracuse University High Energy Physics (HEP) group is organizing a three week long summer QuarkNet program in the Physics Department at Syracuse University. We are recruiting high school teachers from around the area to participate. QuarkNet is a NSF/DOE funded program to provide professional development and on-going support for high school physics teachers via interactions with researchers in the field of particle physics. The logistical details of the summer program at Syracuse University are:

- **Tentative Dates:** June 25, 2012 - July 13, 2012. These may shift by 1-2 days depending on participant constraints.
- **Location:** Physics building on Syracuse University campus.
- **Stipend:** \$1500 total for the three week long program.
- **Materials Budget:** \$200 per participant for materials for any take-home activities.
- **Contacts:** Steve Blusk (sblusk@syr.edu) and Mitch Soderberg (msoderbe@syr.edu).
- **Further QuarkNet Information:** <http://quarknet.fnal.gov>

More detail about the program activities are provided on the next page. At an upcoming kick-off meeting (date TBD), we'd like to get early feedback from interested high school teachers to make sure the proposed activities are suitable, and also to help us finalize the schedule for the 3-week program. **The number of participants is limited, so please reply as soon as possible, and no later than March 31, 2012.** Participants will be chosen based on earliest response date.

The program will include several lectures on particle physics given by faculty members from the Syracuse HEP group. There will be a 3-day hands-on cosmic-ray workshop given by a QuarkNet representative, during which participants will assemble and use cosmic-ray “counters”. Syracuse will have two of these cosmic-ray devices available for loans to local high schools throughout the academic year. We will also have a variety of activities related to particle physics that attendees will participate in. Among the activities we plan to have available this summer are:

1. **Muon Lifetime** - The lifetime of cosmic-ray muons that reach the earth’s surface will be measured. This activity uses modern computing equipment and scintillation counters.
2. **Neutrino Detector Testing** - The SU High Energy physics group is currently building detector components for an upcoming neutrino experiment at Fermilab. This activity will have participants help build and test the components, and also learn about their function in the neutrino experiment. This activity should produce take-home materials.
3. **Instrumentation Lab** - Participants will set up simple electronic circuits that can be connected to a computer. Studies will be performed of the behavior of amplifiers and other components that are present in the circuits.
4. **Gamma Spectroscopy** - A radioactive source of gamma-rays will be detected by a scintillator counter, which will allow the energy spectrum of these gamma-rays to be studied and compared to theoretical predictions.

We have several other activities that we are considering, including the possibility of some simple computer programming related to particle physics. Each of the activities will come with written instructions, as well as guidance from members of the HEP group who will be overseeing the program. Participants will have an opportunity to perform all of the activities offered.