



University of Kansas
Quarknet Center Report
September 2012

The University of Kansas (KU) QuarkNet center had two major activities this academic year, both during Summer 2012. Our summer research experience for high school students ran from June 1 to July 27 and our workshop for high school teachers was held June 4 thru 6.

Prof. Phil Baringer, QuarkNet center mentor, Prof. Dave Besson, and research teacher Oather Strawderman, from Lawrence Free State High School directed the summer research experience. We had thirty students apply to the program, one more than the previous year, and we had to make difficult decisions about who to accept. We decided to accept 13 students and distribute the funds so that each student would work 122 hours over eight weeks. Eight of the 13 students were female. Six of the 13 are attending KU this Fall, which allowed us to pay some of the stipends from undergraduate researcher funds in another grant. The students were: Carolyn Bandle, Thomas Boatright, Dawson Conway, Erica Crandon, Anna Dietz, Eilish Gibson, Hazlett Henderson, Andrew Johansen, Patrick Shields, Emily Smith, Alexander Souvannakhot, Sisira Srisutiva and Amy Zheng. Bandle, Dietz and Gibson were returning students who had also worked with us in Summer 2011.

On June 1 we assigned students to a variety of projects, matching the students' interests to the projects as best we could. The pre-test was also given at this organizational meeting. In a couple of cases we adjusted assignments a couple weeks in. We held weekly Friday pizza sessions where all QuarkNet students attended. KU undergraduate researchers would present their work and program announcements were made. The students were all invited to go on a field trip to Fermilab July 2-5, led by Strawderman. July 3 was spent touring Fermilab and the 4th of July was spent in Chicago at the downtown museums. On July 25 and 27, the QuarkNet students gave short presentations on the work that they had done during the summer. Most students worked in groups of two or three and the groups gave a single presentation with each student being responsible for five minutes of the talk. Student projects included measurements of electromagnetic surface waves in ice, writing games in Flash for a particle physics outreach website (quarked.org), analyzing CMS Monte Carlo data, and working on antennas for radio detection of ultra-high energy cosmic rays. The post-test was given after the final batch of talks on July 27.

The three-day teacher workshop focused on experiments with cosmic ray detectors, a follow-up to the workshop held in 2010, two summers ago. Four of our five attending teachers were new to cosmic ray detectors and indeed new to the KU QuarkNet center. (David Wright was the sole returnee.) Bob Peterson came from Fermilab to lead the workshop and Kris Whelan visited from QuarkNet. KU undergrad Kate Orr helped us develop synergy between the high school research program and the cosmic ray workshop. Before, during and after the workshop she developed experiments with the detectors and then she trained the high school students in the use of the detectors and the performance of the experiments. Pictured in the photo below are (from left to right) Matt Peterie, Bryce Baringer, Kris Whelan, Drew Keiter, Kate Orr, Bob Peterson, David Wright and Jake Burkholder. Matt, Drew, and high school researcher Alex are all from Olathe Northwest High School; they used their summer experience to develop a cosmic ray research program that they are taking back to their high school this Fall.

