University of Kansas QuarkNet Center

Summer 2018 report

The University of Kansas (KU) QuarkNet center hosted a three-day workshop for high school physics teachers June 11-13, 2018. The workshop theme was particle detection. Five KU professors in the experimental particle physics group contributed talks or demonstrations to the workshop. Six teachers attended, two of which were new to the KU center.

On the first day of the workshop, center mentor Phil Baringer gave a general introduction to particle detection techniques followed by an overview of tracking detectors. In the afternoon Alice Bean discussed silicon detector technology, including a lab tour, and the teachers did web research on related topics.

The second day began with teachers reporting on the results of their web research. Baringer presented on general principles of calorimetry and Graham Wilson showed the group some scintillators and how to build a cloud chamber. In spite of the cloud chamber's refusal to cooperate for long, most of the teachers came away inspired to build their own cloud chamber.

The final day had talks on timing detectors from Chris Rogan and radio Cherenkov detectors from Dave Besson. The afternoon was devoted to discussion of possible classroom applications of particle detection ideas.

The workshop schedule is attached below.

QuarkNet Workshop Schedule

June 11-13, 2018

Malott 2005

Monday, June 11

9:00 AM Introduction to Workshop

9:30 AM How particles interact with matter – Phil Baringer

10:30 AM Break

11:00 AM Measuring a particle's momentum – Phil Baringer

Noon Lunch

1:00 PM Silicon detectors – Alice Bean

2:00 PM Lab tour – Alice Bean

2:30 PM Break

3:00 PM Web research on tracking technologies – possible topics: Wire chambers/Georges Charpak, time projection chambers, cloud chambers, bubble chambers, diamond detectors, superconducting magnets, track finding software, other applications of particle detectors (such as medicine, security)

4:00 PM Adjourn

Tuesday, June 12

9:00 AM Introduction to Tuesday's topics

9:15 AM Presentations on web research – workshop participants

10:30 AM Break

11:00 AM Measuring a particle's energy – Phil Baringer

Noon Lunch

1:00 PM Particle identification – Phil Baringer

2:00 PM Live Particle Detection with Cloud Chamber and Scintillators – Graham Wilson

3:30 PM Reflection, questions for Wednesday

4:00 PM Adjourn

Wednesday, June 13

9:00 AM	Introduction to Wednesday's topics
9:30 AM	Timing detectors – Chris Rogan
10:45 AM	Break
11:00 AM	Radio detection of particles – Dave Besson
12:15 PM	Lunch
1:15 PM	Group work – considering classroom applications
2:15 PM	Break
2:30 PM	Groups report out on classroom applications
3:30 PM	Workshop wrap up -- feedback
4:00 PM	Adjourn