

Virginia QuarkNet Center 2019 Activity Report

November 23, 2019

The Virginia QuarkNet Center currently has around 10 active high school teachers from Richmond and northern Virginia. Josh Erlich from William & Mary and Phil Rubin from George Mason University are the mentors. Several teachers share leadership responsibilities, with Deborah Roudebush acting as the lead teacher. QuarkNet Fellow Mike Fetsko also assumes a large share of the organizational responsibilities.

Masterclass 2019

The Virginia center scheduled two Masterclasses in March 2016.

A CMS masterclass took place at William and Mary on March 9, 2019, with Josh Erlich mentoring and lead teacher Mike Fetsko organizing. In addition to the analysis of CMS data and the videoconference, the students heard presentations about particle physics and they toured a neutrino control room, a polarized helium laboratory for a JLab experiment, and an ultra-cold atom lab.

Another masterclass focused on neutrino-nuclear reactions via the MINERvA experiment, and was held at George Mason University in northern Virginia on April 6, 2019. Phil Rubin acted as the mentor, and lead teacher Deborah Roudebush was the main organizer. In addition to the data analysis activity and videoconference, the masterclass included an introduction to particle physics with a focus on neutrinos, and an introduction to detectors and data analysis.

In addition, Mike Fetsko organized an unofficial J/Psi masterclass at Godwin HS and videoconferenced with schools from Minneapolis, MN and Medford, MA to discuss the results from the data analysis. A former Godwin HS student who currently resides in Berlin, Germany and works on the IceCube experiment also connected with the students and discussed her work and life as a physicist.

Workshops

The Virginia center generally has a 2-3 day summer workshop and two or three Saturday workshops. Over the past year, they met at the Bryan Innovation Lab of The Steward School on November 17, 2018; and at Centreville High School in Northern Virginia on March 23, 2019.

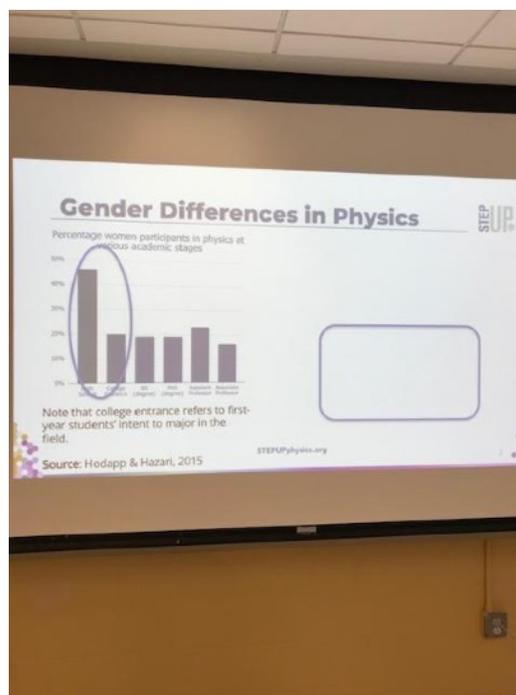
The workshop at The Steward School included a presentation by Josh Erlich about cosmology, an activity led by Deborah Roudebush about signal vs noise in experiments; and a Feynman diagram activity.

The workshop at Centreville High School included discussion of the MINERvA Masterclass and included a videoconference with Ken Cecire; and a talk by Phil Rubin on the latest particle physics results.

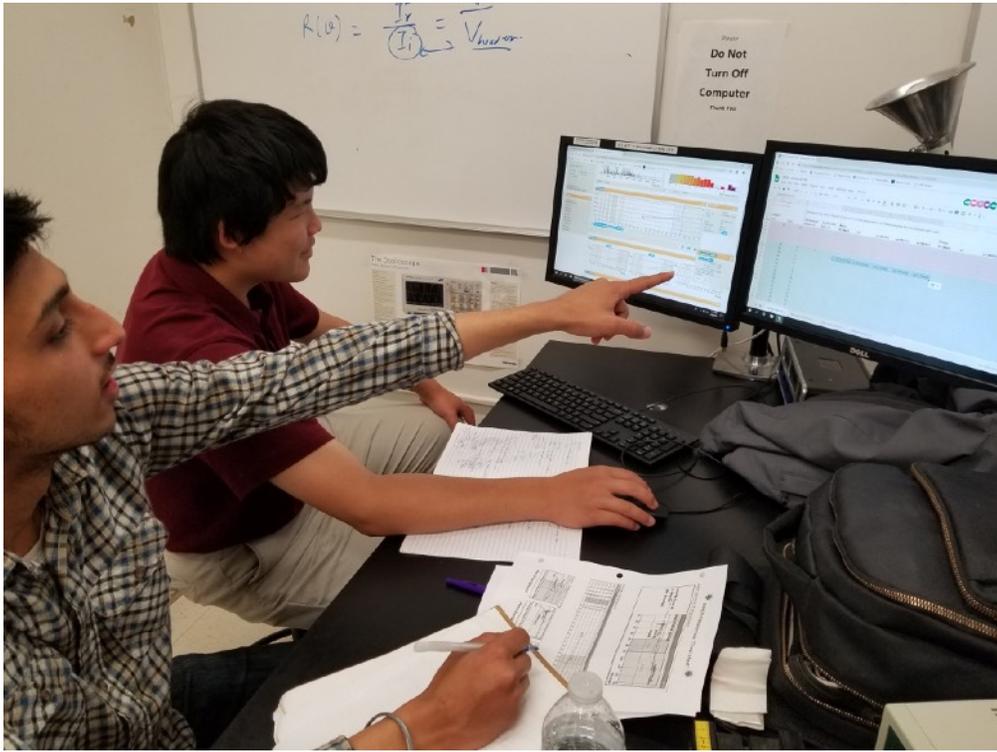
The summer 2019 workshop took place August 5-7, 2019 at William & Mary. We had a CMS data workshop led by Marla Glover, who also guided us through the TOTEM Data Express exercise related to the proton radius. Deborah Roudebush led a Step Up workshop focused issues of diversity in physics. And Josh Erlich discussed the Event Horizon Telescope image of the M87* black hole.

Additional Teacher Activities

Mike Fetsko attended the International Teachers Week program at CERN in August, 2019.



Step Up workshop at August meeting, William & Mary



Masterclass at George Mason University