Rutgers 2022 Annual QuarkNet Program Report

This year the Rutgers QuarkNet Center was very pleased to be able to once again hold our acclaimed two-week [Summer Program on Fundamental Physics](#) for New Jersey high school students after a two year hiatus due to Covid restrictions. Twenty-four students participated in daily
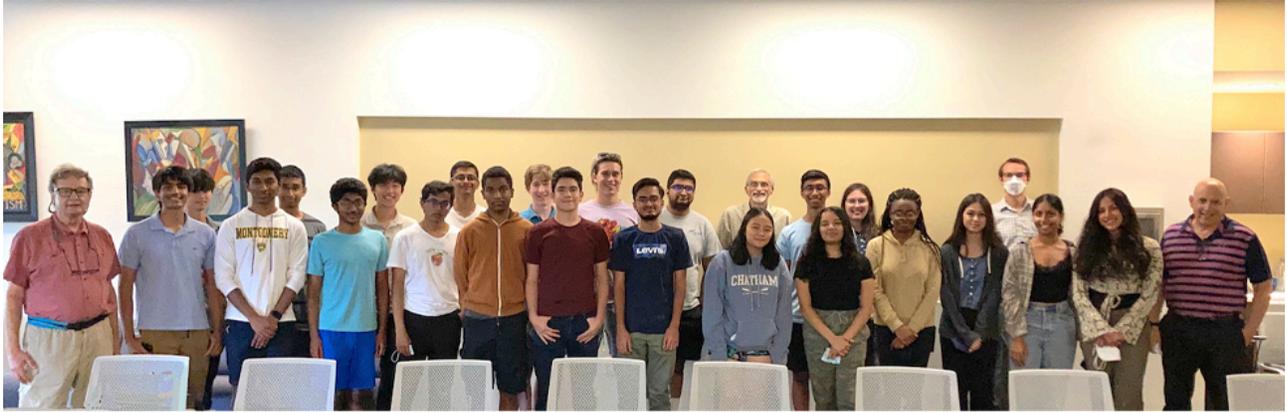
sessions covering neutrino physics, quantum computing, cosmic ray detection and cosmology. In the neutrino sessions, students participated in hands-on activities analyzing data from the Fermilab MINERvA experiment. In the quantum computing sessions, students used the IBM Qiskit framework to compose quantum algorithms and run them on actual quantum computers through the cloud. In the cosmic ray sessions students used the cosmic ray detection kits provided by Quarknet to make measurement on cosmic ray muons including a high-precision measurement of the muon lifetime. A high point of the program was the Friday evening closing event in which groups of students gave presentations to an audience of family, friends and teachers on what they had learned during the program. These were very well done and everyone was very impressed by what the students had learned and accomplished. In addition to the summer program, we also held a Masterclass program in March on data from the MINERvA experiment attended by twenty-five students and four teachers.

Mentor: Steve Schnetzer

Rutgers University is one of the oldest QuarkNet centers having been established in 2000 the second year of the NSF funded QuarkNet program. Our center has trained over twenty high school physics teachers from throughout New Jersey in leading edge particle physics and have involved them in the construction, operation and classroom use of cosmic ray detector kits. For over ten years, we have run a highly successful two-week summer program for high school teachers and students.