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Quarknet

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QuarkNet started as a small pilot project about 15 years ago and has now grown into a national program with more than 50 centers spread across the United States. Each year several hundred high school teachers, along with another hundred high school students, work together with particle physicists to create a community of researchers. With support from the National Science Foundation and the Department of Energy, QuarkNet provides professional development for teachers and brings the excitement of modern physics research to interested students. Each QuarkNet center is in some sense an individual program. A few examples of different successful centers will be contrasted and compared. About half of the centers include student research and a number of those research activities will be discussed in the talk, including contributions of QuarkNet students to major particle physics experiments like CMS at the LHC. One of the original motivations for QuarkNet 15 years ago was the realization that the future graduate students and postdocs working at the LHC were at that time in middle and high school. One of the great successes of QuarkNet within the past few years has been to bring LHC data into the classroom for teachers and students to analyze. The talk will review how this was accomplished and look at our plans for the future. QuarkNet has created a network of teachers and students who study cosmic rays with detectors they assemble and operate. Via the cosmic ray “e-lab” students collect data, prepare posters and share their results with other students around the country and overseas. The “masterclass” is another important tool that brings current physics research to groups of students. These have primarily focused on high energy physics but new masterclasses in astrophysics are under development. Recently the QuarkNet program was approved for another 5 years of support from NSF and DOE. While continuing to grow key aspects of the program like the e-labs and masterclasses, one goal of the new program is to start to engage the Native American community in physics outreach. Initial plans for this new direction for QuarkNet will be presented.