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Physicists Inspiring the Next Generation: Exploring the Nuclear Matter

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A joint collaboration between the National Society of Black Physicists (NSBP) and the National Radio Astronomy Observatory (NRAO) launched a two-week program geared toward middle and high school students in the Summer 2014. The program, known as "Physicists Inspiring the Next Generation (PING): Exploring the Cosmos", involved 20 pre-college students and 4 undergraduate students. Students were tasked to collect data from the 21 cm emission line of the hydrogen atom from specific locations in the universe using the 40 ft radio-telescope of the Green Bank Observatory located in Greenbank, WV. The program is now part of the outreach programs of NRAO and is being held annually. In the Summer 2019, a one week-long pilot program "Physicists Inspiring the Next Generation (PING): Exploring the Nuclear Matter" was conducted at the Facility for Rare Isotope Beams/National Superconducting Cyclotron Laboratory in East Lansing, MI. The program included 4 high school students and 2 undergraduate students. Students were tasked to build two parallel plate avalanche chambers to be used as beam monitoring systems for nuclear physics experiments conducted by the MoNA Collaboration at this facility. One additional difference from the original astronomy focused PING program is the extension of the high school students beyond the summer that continued over the entire academic year. One student was tasked to model one of the MoNA experiments scheduled in the Summer 2020 that will study ^{13}Be and his isomer using the Geant4 Monte Carlo based G4beamline software and ROOT analysis tool. The setup consists of six silicon detectors, a beryllium target, a cesium iodide calorimeter and a veto scintillator. More specifically, the goal was to reconstruct the momentum and angular distributions of all isotopes exiting the CsI and depositing some energy in the veto detector. The PING program has inspired several students to pursue an education in STEM, some currently pursuing B.S. and Ph.D. degrees in physics and astronomy. We will provide an overview of the PING program and highlight some personal experiences that make this program very successful.