

### Arecibo Observatory Space Academy: Inspiring the Next Generation of Scientists from Puerto Rico

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**Introduction:** The Arecibo Observatory Space Academy (AOSA) is a ten week research program for pre-college students in grades 9-12. The goal is to promote student investigations using inquiry-based learning and indirect teaching methods. Each Fall and Spring semester, selected high school students participate each Saturday, to explore the world around them. The students, or cadets, get experience designing, proposing and carrying out research projects related to the exploration and developments towards humans living and working in space.

**Goals:** AOSA admits students with an interest in the fields of science, technology, engineering, arts and mathematics (STEAM) and help them to realize their full potential. Hispanic students are among the most underrepresented groups in science and engineering, so this program is especially important to reach the Puer-torican community. We aspire to liberate our students from the box of standardized education and testing that high school students often experience. Students are encouraged to find innovative ways to find answers, and to use all available resources in their research. The students develop their own projects around a central theme, and individually or in small groups carry out investigations under the guidance of mentors and students from previous sessions of the Academy. The Academy provides a place for students from around Puerto Rico with common interests in space and other technical fields to come together and collaborate with each other. We ensure that the students are given the chance to interact and make lasting connections with each other, mentors, and people in their fields of interest, whom they might not have met otherwise.

**Selection and Evaluation:** Students go through an application, interview and trial period before being accepted as a full cadet in the program. Each individual is evaluated with program compatibility based on peer interaction, preparation, participation, contribution to class, group dynamics, attitude, challenges and inquiry. This helps to ensure that specialized attention can be given to students who demonstrate a dedication and desire to learn

**Research:** During the semester, AOSA students are responsible for designing, proposing, and implementing a research project. Project topics and designs are very flexible to accommodate anything related to space exploration and humans in space. Cadets get the opportunity to explore their topic of choice and to practice the scientific method. For many students, this is a new

experience, and they find that real science is nothing like cinema magic. Deciding how to proceed in the face of set-backs and unexpected problems is central to the learning experience. Puerto Rico offers very little opportunity for pre-college students to gain experience in learning through active participation because few local schools have any resources at their disposal.



Figure 1: AOSA Cadet, Cristina Crespo, working on research involving light intensity under the telescope.

**Future Plans:** At the end of the semester students present their research to the program mentors, peers, and scientific staff. In Puerto Rico, education is in Spanish, although English is part of the curriculum. To continue in STEAM fields, students must be proficient in English, so cadets are strongly encouraged to work on both writing and speaking skills. In December 2014, the first bi-annual research symposium was hosted by the Arecibo Observatory. Our program has been very successful, and has been gaining in visibility. We will present the past successes of the program, and plans for the future.

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Figure 2: Participants December 2014 with NASA Administrator, Charles Bolden, visiting Arecibo.