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Profs to Defend Arecibo Funding in D.C.

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On September 12 and 13, dozens of astronomers plan to meet in Washington, D.C. to discuss the future of the Cornell-owned and operated Arecibo Observatory in Puerto Rico, the largest radio telescope in the world.

According to Prof. Yervant Terzian, astronomy, who will be the final speaker at the meeting, "The purpose of this meeting is to gather scientists with the potential of using Arecibo in the future to do various projects, to summarize and prioritize the work that Arecibo will do, and to show the uniqueness and importance of the Arecibo giant radio telescope."

With a 1000-foot diameter and about 18 acres of collecting area, Arecibo is peerless in size and sensitivity. Originally built to study the ionosphere, Arecibo is now used by about 300 scientists a year, who are drawn to its unmatched ability to collect and focus radiation from a large portion of the universe.

However, the future of this "jewel" of a telescope (as Terzian called it) has been on shaky ground since last November.

On November 3, 2006, the National Science Foundation (NSF) issued a "Senior Review" report that advised that the NSF cut Arecibo's funding by 20 to 25 percent in order to free up funding for new observatories and projects. If Cornell could not find other sources of funding, the report recommended that the observatory be shut down.

Since then, the NSF's financial situation has changed, but their decision apparently has not. The Senior Review committee began their investigations in 2004. According to Prof. Robert Brown, astronomy, director of the National Astronomy and Ionosphere Center, "[The Senior Review's] recommendation was based on the assumption that the NSF's astronomy budget would remain flat for the next five years. If we wanted to do anything new, we would have to stop doing something old."

However, according to the NSF's website, the NSF's budget for major research equipment and facilities construction has increased by almost 30 percent since 2004,

from \$148.54 million dollars in 2004 to \$190.88 million dollars in 2007. This is a far larger amount of money that the NSF could expect to save from cutting funding to Arecibo.

“It would be utterly foolish for the NSF to follow through with this plan, since it was founded on an incorrect basis,” said Brown.

Astronomers hope that the upcoming conference will help demonstrate how crucial Arecibo is to pushing the frontiers of astrophysics, atmospheric science, and planetary science. While Cornell astronomers expressed varying levels of cynicism about the NSF’s flexibility, the overall outlook seems optimistic.

“We are very hopeful that the NSF will continue to realize the importance and uniqueness of the Arecibo facility and will continue to fund it at an adequate level,” said Terzian.

Brown added, “Generally one stages something like the Senior Review as a way to draw attention to a problem. It serves a useful function, but it should not be taken seriously. I’m very confident.”

Despite the overtones of financial stress, Cornell astronomers expect much of the meeting to be simply fun.

“[Conferences like these] are healthful for the whole field,” said Brown. “There’s a lot of bonding that goes on there.”

One of the major topics to be discussed is the future of Arecibo’s powerful planetary radar, which bounces radio waves off of planets and asteroids and “listens” to the echoes in order to create the most finely resolved images of planetary bodies that exist. Some of the most important things that the radar studies are Near-Earth Asteroids (NEAs), asteroids whose trajectories bring them close enough to the Earth for scientists to worry about an impact.

“An impact hazard is a risk comparable to other natural hazards, like earthquakes or hurricanes,” said Prof. Jean-Luc Margot, astronomy. “Lots of money goes to mitigating the effects of earthquakes and hurricanes, but we can really do nothing about them. We can actually do something about impact hazards. If we identify a potential impactor, we have the technology to deflect it.” Margot and other scientists use Arecibo to characterize the orbits of NEAs to incredible accuracies, so that they can identify which objects are worth worrying about.

“No other instruments can do that,” said Margot.

Another exciting topic on the table is SETI, or the Search for Extraterrestrial Intelligence. In 1999, Arecibo achieved national fame when it began collecting data for SETI@home, a downloadable screensaver that uses ordinary people’s personal computers to analyze data and search for evidence of intelligent life in the universe.

Prof. Jim Cordes, astronomy, and Terzian wrote a paper to be presented at the conference that suggests piggybacking SETI projects on other ongoing Arecibo projects, such as all-sky surveys of the Milky Way and extragalactic space.

“This is a long-term kind of thing—any signal we detect will probably be intermittent,” said Cordes.

It would take time and dedication to detect and monitor potentially intelligent signals. This is another strong argument for keeping Arecibo running for at least another 10 years.

“We need to make a case for Arecibo, and we need to make it compelling,” said Cordes. “We’re making a road map for Arecibo science and instrumentation for the next 10 to 15 years, as well as marshalling the community into action.”