



Astronomical history comes back to life in South Jersey

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Fred Carl of the InfoAge Science Center with the remodeled radio telescope. ED HILLE / Staff



GALLERY: Astronomical history comes back to life in South Jersey

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The Inquirer

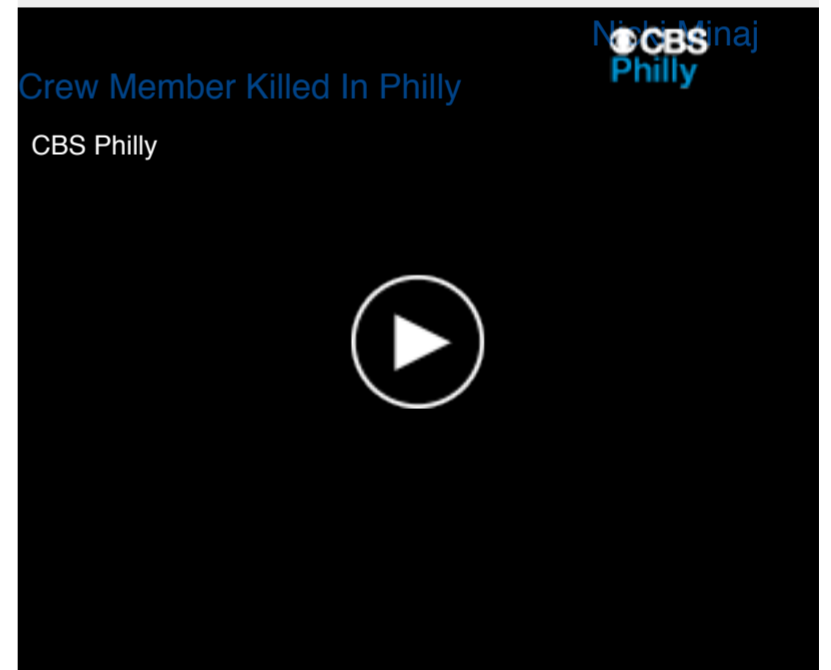
WALL, N.J. - The five-story satellite dish made history nearly six decades ago, early in America's space race with the Soviet Union.

It tracked the first U.S. space launch, Explorer 1, that year, and received the first hurricane data from the TIROS 1 satellite in 1960.

Then the dish was mothballed in the late 1970s as more modern equipment came into use, and eventually was relegated to the status of science relic, part of the museum collection of the InfoAge Science Center at Camp Evans, a historic former Army Signal Corps center in Monmouth County.

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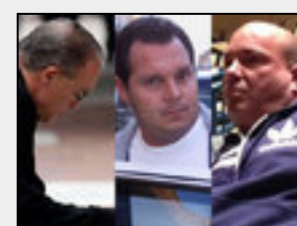
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No one thought the deteriorating leftover would ever be used again.

Then, about two years ago, InfoAge director Fred Carl received a call from a Princeton University professor who - along with others - volunteered his time to give the dish new life and purpose: receiving radio waves from space, and observing pulsars and other astronomical events.

The new capabilities promised to transform it into an educational and research tool for Princeton and local students.

Over countless hours, vacuum-tube technology and rusty equipment was replaced, massive motors were reconditioned, and software was added to transform the site into a modern radio telescope.

The first test came last month, and no one was disappointed.

After lying dormant for decades, the dish, overlooking Shark River, successfully picked up radio waves emitted from hydrogen gas deep in the Milky Way galaxy, thousands of light years away.

"That was just to prove the telescope worked," said Daniel Marlow, the Evans Crawford 1911 Professor of Physics at Princeton, who helped pull together the team of about a dozen volunteers that worked on the project.

"We were worried about interference from terrestrial sources, but the data was good," he said.

The test thrilled Carl and the staff of InfoAge, a nonprofit, hands-on science and learning center for children that opened at Camp Evans in 2001.

"This is beyond a dream," said Carl, a former science teacher and computer sales support representative. "It will inspire kids to learn about science.

"I never thought this dish would be working and that students would benefit," he said.

The next goal? "We will attempt to pick up signals from distance point sources," Marlow said. "We're focused on stars."

In the next few weeks, the dish will be aimed at Cassiopeia A, a supernova remnant in the constellation Cassiopeia and the brightest extrasolar radio source in the sky.

Data from the equipment are picked up, then made available online so teachers and students will not have to be at the dish site.

"It's available 24/7," Marlow said. "It can be used in a lab course, and other courses can be developed for students who



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don't major in the natural sciences.

"Whether they go on to be scientists or not, these courses are designed to give students an appreciation for the scientific method and science itself," he said.

Local students also will use the dish. "We envision opening up the site to them as well as the staff [of Wall Township public schools] and families," said Jeff Janover, director of technology for the school system and an InfoAge trustee. "In order to get into a top university like Princeton, you have to have done research."

Transformation of the dish was made possible with \$30,000 in contributions and work from scientists, engineers, technicians, and other volunteers from Princeton, InfoAge, Wall Township, and the Ocean Monmouth Amateur Radio Club (OMARC).

"Everyone was working on this in their spare time," Carl said. "Some had classes to teach, papers to write, and grants to write."

Over months, the volunteers rewired equipment and installed junction boxes, power feeds, and a new feed horn in the center of the dish to translate radio waves from space into data to be fed into computers, Carl said.

At one point, a one-ton motor that tilts the dish was lowered with pulleys onto a flatbed truck and driven to a Texas company, which reconditioned it.

What might have cost Princeton millions of dollars to build from scratch ended up only costing tens of thousands, Carl said.

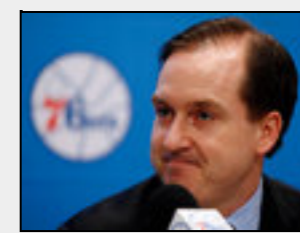
The site of the dish was already a historic place when it was built in 1958. The Army Signal Corps had conducted an experimental project there in 1946 called Project Diana, named for the Roman goddess of the moon.

A large transmitter, receiver, and antenna array bounced radar signals off the moon and received reflected signals in the first experiment in radar astronomy and the first attempt to actively probe another celestial body.

Twelve years later, the dish was erected and was the latest in Earth-observing technology. Data from TIROS 1 were received on April 1, 1960, and a photo of a forming hurricane was flown by jet to President Dwight D. Eisenhower in the White House the same day.

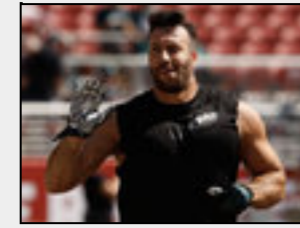
"For hurricane tracking and Earth-observing satellites, this was like the Wright brothers' first flight," Carl said. "This was the birthplace of hurricane tracking.

"It was a scientific sensation in its day," he said. "The dish is a national treasure."



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InfoAge oversees 16 buildings on 37 acres of what once was a 50-building, 200-acre site where scientists worked on radar and other electronic projects during World War II. Saving it from demolition "was our gift to the nation," Carl said.

Situated at 2201 Marconi Rd., InfoAge has numerous attractions and memorials in its buildings, including a military electronics and radar, military technology, and shipwreck museums.

Officials say they expect the dish to become one of the most popular attractions. Three similar dishes can be found in Alaska, Canada, and Australia, but none is being used.

Students who tour the site an Camp Evans have looked up at the massive structure and learned about its place in history. It was repainted and refurbished in 2006 with help from the original manufacturer, Harris Corp., of Florida, which contributed \$16,000 for the work.

Now, researchers will be able to do more than look at a relic; they will gather live data. A visitors center with a NASA-style control room and exhibit is being created out of one of the original buildings next to the dish. It will open April 1.

"It's amazing that a small group of preservation volunteers have enabled Princeton University to rehabilitate this historic dish into a new tool for science education," Carl said.

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