

Apple Valley site allows students to tap into deep space

By Jim Steinberg Staff Writer

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Students the Academy of Academic Excellence in Apple Valley collect data using radio telescopes from NASA's Goldstone Deep Space Network in the Mojave desert as a part of a long-term study on power fluctuations in quasars, Thursday, Sept. 8, 2011. The Space Science Class is a part of the Goldstone Apple Valley Radio Telescope or GAVERT project, a partnership of the National Aeronautics and Space Administration, Jet Propulsion Laboratory and the Lewis Center for Educational Research in Apple Valley. (Eric Reed/Photographer)

APPLE VALLEY - Gabriel Perreira is just starting out in the ninth grade and already he has two years of experience on a radio telescope.

At age 15, he's participated in major research projects, including one that confirmed there's water on the moon.

Now, says Gabriel, he's considering a career in science.

Gabriel's world was astronomically expanded by participating in the Goldstone Apple Valley Radio Telescope project, a partnership of the National Aeronautics and Space Administration, the Jet Propulsion Laboratory and the Lewis Center for Educational Research in Apple Valley.

The radio telescope project began when the government gave the Lewis Center a \$12million radio telescope slated for demolition.

"It was going to cost \$2million to take down," said Rick Piercy, the Lewis Center founder and president/CEO.

Piercy said he talked to Rep. Jerry Lewis, R-Redlands, who set up a meeting with then-NASA administrator Daniel Goldin, who supported turning it over to a school.

The Lewis Center operates two public charter schools on four campuses.

A nine-story structure supports a 110-foot wide dish known as Deep Space Station-12 at the Goldstone Deep Space Communications Complex on Fort Irwin property, about 35 miles north of Barstow.

The 850,000-pound structure is operated remotely in a sophisticated command center, called "Mission Control," in the Lewis Center's Technology Building.

Participation in the Goldstone Apple Valley Radio Telescope project is open to science teachers and their students worldwide via the Internet.

Science teachers used to have to attend a five-day training program for \$995 at the Lewis Center prior to radio telescope access. But because of today's school budget realities, a free, less detailed training program is now available online, said Ryan Dorcey, manager of global operations.

After gaining exclusive access to Deep Space Station-12 in the late 1990s, the Goldstone Apple Valley project picked up some time on nearby DSS-13, a research antenna with more capabilities.

And recently, the Lewis Center gained exclusive access to DSS-28, a state-of-the-art radio telescope at the Goldstone site developed for the "Star Wars" defense program, Dorcey said.

Dorcey expects this newer generation listening device will be incorporated into the Goldstone Apple Valley Radio Telescope program early next year.

At Mission Control in Apple Valley, students can direct the antennas of DSS-12 and DSS-13 to points in space where they want to listen. Web cameras allow them to watch the antennas turn after they punch in the appropriate coordinates.

Before listening for deep space signals, students must master the art of directing the antennas and checking their calibration by zeroing in on space objects known to produce extremely stable signals.

A weekly chart compiled by Mission Control staff tells students which calibration signals and what study sites are visible to the antennas during their class time.

NASA avoids space objects fading from view due to the Earth's rotation by operating two other deep space communication complexes: in Madrid and Canberra, Australia.

Researchers take their collaboration with Goldstone Apple Valley students seriously, said Steven M. Levin, Juno project scientist at JPL.

Last month, an Atlas 5 rocket at Florida's Kennedy Space Center lifted off with a space probe called Juno that will look for clues on Jupiter about the solar system's origins.

Jupiter data collected by Goldstone Apple Valley Radio Telescope students over a decade was a valuable resource for scientists plotting a course for the probe that would avoid Jupiter's powerful radiation fields, Levin said.

Scientific modeling of those fields was adjusted to include the long history of Jupiter monitoring done by the students, he said.

"It is a better science mission with GAVRT than without," said Levin, who has been the lead scientist at JPL working with the Goldstone Apple Valley Radio Telescope project and coordinating that research with other scientists.

Scientists treat the work the students do seriously because radio telescope time is scarce, he said.

NASA likes the project, he said, because "it helps kids begin to think scientifically and helps them understand the world rather than just live in it."

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