

Feb. 5, 1990

E.T. Hunters to Seek Signs of Life in Southern Skies

■ **Space exploration:** Grass-roots groups and NASA scientists are heading for Latin America to scan the heavens for extraterrestrial signals.

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Hey, E.T., if you have been hiding somewhere in the southern sky, the jig may be about up.

The Planetary Society, which has been looking for you in the northern sky for several years now with no success, is shipping a truckload of equipment to Argentina to carry out the search for the first time from the Southern Hemisphere. And if you would just beam out a radio message to Earth sometime soon now, it would save everybody a lot of time.

The Pasadena-based Planetary Society, a grass-roots organization dedicated to promoting the exploration of space, is investing about \$200,000 in the expansion of its search for extraterrestrial intelligence in hopes that some folks out there on some other planet in some other solar system may be interested in letting earthlings know they are there.

For several years now the society has sponsored the work of Paul Horowitz of Harvard University, who has been using an old radio telescope about an hour's drive from the Cambridge campus to search the part of the sky that is visible from the Northern Hemisphere. The move south was prompted by the fact that the southern sky cannot be

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Institute for Radioastronomy of Argentina

observed from the north, and the center of the Milky Way galaxy with its billions of stars can be seen only from the south.

So for the first time, the search for E.T. will cover the entire sky.

"This is an important milestone," said Louis Friedman, executive director of the society. Moving the search south, he said, "more than doubles the number of good targets"—stars that support life on planets, as the sun supports the Earth.

There are nearly 800 stars within 75 light-years of Earth that are prime candidates for extraterrestrial intelligence. The search will cover all of those stars specifically, as well as all the others in a broad sweep of the heavens.

The system uses a sophisticated computer to "listen" to millions of narrow radio wavelengths, and it produces a graphic that looks a little like an electrocardiogram. Strong emissions are registered as spikes on the graphic, giving the researchers specific targets to concentrate on if they look interesting. So far in the north, however, all the spikes have been caused by radio emissions from earthly sources.

Raul Colomb, director of the Institute for Radioastronomy of Argentina, said the equipment has been under construction at Harvard for the past year

and it will be shipped to Argentina within a few weeks. Colomb will use a 30-meter radiotelescope that has been operating at the institute for more than a decade.

Colomb, who briefed officials with the Planetary Society in Pasadena last week, said scientists at his institute, located near Buenos Aires, will begin operating the equipment as early as June.

But the actual search, appropriately enough, is set to begin on Columbus Day, Oct. 12.

He estimated that it will take about 160 days to sweep the southern sky in the first phase of the three-year program.

"The completion of our first survey will mean that for the first time the entire sky will have been explored," Colomb said.

The society's program, which is the only comprehensive search now under way, is far more narrowly focused than an ambitious effort planned by the National Aeronautics and Space Administration over the next decade. NASA hopes to conduct a complete survey of the sky at a wide range of frequencies in a program that would use the largest radio telescope in the world at Arecibo, Puerto Rico. But NASA's program has had trouble getting the \$100 million the full project would need, and it may be scaled down.

Even if it is never fully funded, however, NASA scientists expect to begin at least a limited search in a couple of years.

"We will find a way to descope the search if necessary," said Edward Olsen of the Jet Propulsion Laboratory in Pasadena. "We will do some part of it."

Olsen, who is a member of JPL's Search for Extraterrestrial Intelligence team, said scientists will continue to push for the full program because "the payoff is incalculable."

Meanwhile, the Planetary Society, supported by contributions from its members, will push ahead in a program that could lead to what many believe would be the most important discovery of all time—the existence of other intelligent forms of life elsewhere in the universe.

Unlike the NASA program, which would search a wide range of frequencies, the society's program concentrates primarily on one wavelength, the radio frequency emitted by hydrogen. But the society's project, called Megachannel Extraterrestrial Assay, or META, will search 8.4 million ultra-narrow channels in the hydrogen band.

The society's program is based on two broad assumptions: Someone out there wants to be detected, and thus is broadcasting a message to space; and extraterrestrials would probably broadcast at the hydrogen frequency. Theoretically, E.T. would know that is the frequency someone else would most likely be monitoring since hydrogen is the most common element in the universe.

Scientists also call it one of the "magic frequencies," and, in what has become part of the folklore in the search for E.T., they say it makes sense to look there because hydrogen is the principal component of water and civilizations have always gathered at the watering hole.

The society's search has one advantage over NASA's project. Since it is concentrating on one frequency, it will be more sensitive to signals at that



Associated Press

Raul Colomb, with photograph of 30-meter radiotelescope to be installed in Argentina, at briefing for Planetary Society members in Pasadena last week.

wavelength.

"We could detect an earthlike civilization 500 light-years away," Colomb said.

However, that is true only if E.T. is beaming a powerful message toward Earth. And if he/she/it is using another frequency, the society's computerized equipment would miss it.

"We're trying to outguess the aliens," said Thomas McDonough, who is coordinating the search for the Planetary Society.

NASA's program is the best hope of detecting signals at other frequencies, but it will be about 100 times less sensitive to weak signals than the society's equipment.

"We are sacrificing sensitivity to get a broader coverage," said NASA's Olsen.

Thus the two programs are complementary.

Scientists involved in both programs are reasonably confident they will be able to tell whether any signals they receive are messages from extraterrestrials or part of the natural radiation from space.

"If the signal doesn't move, you know it's coming from Earth," said McDonough, because the Earth rotates and stars in the sky are constantly changing their position relative to ground observers.

Also, the laws of physics determine which processes in the natural universe emit radio waves, and a signal that differs significantly could only have been created by intelligent beings. Thus a powerful radio beam from space that stands out from natural background radiation would be a clear signal to

scientists that they have found something.

"I hope if we make contact they can understand Spanish," quipped Argentina's Colomb.

However, even if the search is successful, no one expects to be able to carry on a conversation with aliens. Space is so vast that it takes several years for radio waves, traveling at 186,000 miles per second, to reach even the nearest stars.

So instead of a chat, scientists are hoping for a message they can decipher, which hopefully will be of some use to a primitive society on Earth.

Presumably, it will not come from a civilization looking for cheap labor.

And although Friedman said he hopes the Argentina search will find something "as soon as they turn it on," he is the first to admit that is unrealistic.

"In my gut, I think this is a 50-year search," he said. "If we don't find anything in 50 years, then we will all get discouraged."