

Space Watch: ETs may be beaming lasers at us

Optical search starts after UC Berkeley astronomer suggests aliens shine light

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Friday, December 13, 2002 - BERKELEY -- For more than 40 years, researchers on Earth have scanned data from radio telescopes around the world looking for signals from another civilization somewhere in myriad stars -- without results.

Now, thanks to a suggestion from a University of California, Berkeley, Nobel laureate, they're trying something different: Astronomers are peering into space with their own eyes. They are looking through data from optical telescopes seeking bright bursts of laser light that would indicate a sentient being is out there.

Astronomers have discovered more than 100 planets circling other suns, and belief is growing that we are not alone.

Indeed, scientists now realize life is hardy. Researchers recently found primitive bacteria nearly two miles down in a South African gold mine, surviving on hydrogen and sulfur instead of oxygen.

The nonprofit SETI Institute, based in Mountain View, conducts a massive radio astronomy search using data received by the huge radio telescope array at Arecibo, Puerto Rico. The optical search began about two years ago, and more astronomers are signing on.

Besides a UC Berkeley effort at the Leuschner observatory near Orinda, and by a Harvard astronomer, SETI and UC Santa Cruz are conducting a search from the Lick Observatory on Mount Hamilton, near San Jose. SETI also has commissioned UC Berkeley graduate student Amy Raines to examine data obtained by Berkeley planet hunter Geoff Marcy.

The optical idea came from UC Berkeley professor Charles Townes, who shared the Nobel Prize for physics in 1964 for the basic inventions that led to the laser, which he patented with Arthur Schawlow, a 1981 Nobel laureate.

Townes said Thursday he's delighted about the optical search.

It has always made sense to him to look for points of intense laser light from space, he said. A civilization as advanced as our own or more sophisticated might indeed use a tight, compact laser beam as a bright signal.

Dan Werthimer, a UC Berkeley astronomer and extraterrestrial intelligence researcher, says he's a bit chagrined.

"Charlie Townes' office is right next to mine. I've been here 25 years and he's said for a long time, 'Dan, you should do some optical searches,'" Werthimer said. "Charlie was right, and we're really a little bit embarrassed. We thought radio was the only way to communicate between the stars. But that is an antiquated point of view."

Radio was developed during World War II and the technology became good, Werthimer said. "Lasers came along later and, at the time they were invented (before 1960), they were little dinky things.

"Only Charlie Townes could see the laser power that was coming."

Townes said he and a colleague first wrote a paper on a laser search in 1961. "A civilization out there could be a thousand years ahead of us," Townes said. "It seems possible that some being on a planet orbiting a nearby star could send a bright enough beam that we could see it blinking."

Radio waves spread out, but laser beams stay compact and focused, he said. "Nobody took us very seriously then, but now people have begun to say, 'Wait a minute.'"

Townes advanced the idea again in 1997 at a SETI Institute planning session, and this time the group took him seriously. Planners included laser experts from Livermore National Laboratory, where the world's most powerful lasers are being developed for the National Ignition Facility.

Optical SETI was born.

Seth Shostak, SETI Institute senior astronomer, said the optical idea makes a lot of sense.

"Charlie pointed out to us that if an advanced civilization wanted to get in touch with Earth, why not ping us with a laser. Pulses as short as a nanosecond -- one billionth of a second -- would do it," he said.

"There are lasers at Livermore now that could send a signal like that," Shostak said.

Building such a laser is expensive, but looking for a beacon is cheap, well within SETI's nonprofit budget. "For \$10,000 or less, you can build an instrument to look for beacons. Now it's being done," Shostak said.

Townes watches the whole process with delight. He agrees that scoffers about the possibility of extraterrestrial life are themselves a vanishing species.

The SETI Institute, in appreciation, will bestow its second annual Frank Drake Award to Townes next spring.

At 87, Townes still arrives at his UC Berkeley office around 8:30 a.m. daily. And he continues his research. "Science is fun," he said. "Why stop?"

