

and later declared bankruptcy, Pianelli says. If the suit is successful, though, it could cost Baylor even more. Angelides has accused the university and its staff of slander and breach of contract, arguing that it ended his tenured professorship without due process.

University officials also declined to comment. But in court filings, Baylor's attorneys maintain that the university simply acted as an agent of the federal government, which requires that allegations of scientific misconduct be fully investigated. Soon, that interpretation of the handling of the charges against Angelides will be vindicated or rejected by 12 citizens of Texas and an appeals board in Washington, D.C.

Whatever the outcome, cell biologist Jeffrey Rosen of Baylor, who acted as Angelides's volunteer faculty adviser during the investigation, argues that the 7-year process leading up to these pending verdicts didn't serve the scientists or the university very well. "I question whether it might not be better to conduct [such inquiries] from the start as legal proceedings," Rosen says, because that would give the accused a better chance to confront the accusers. Instead, the investigation involved a baroque academic process in which all of Angelides's questions to his accusers had to be directed through the chair of the investigative panel, who often rephrased them. Rosen is also unhappy about the amount of time, energy, and money it has taken to referee this quarrel, saying he would "never again" offer to get involved.

—ELIOT MARSHALL

ASTRONOMY

New Telescope Will Turn a Keen Ear on E.T.

BERKELEY, CALIFORNIA—Astronomers listening for radio signals from other intelligent life may soon get their own ear on the cosmos. SETI, the Search for Extraterrestrial Intelligence, has subsisted for decades on small amounts of observing time at radio telescopes built for other purposes. Last Monday, however, the SETI Institute of Mountain View, California, a private advocacy group that supports and carries out SETI studies, and the Radio Astronomy Laboratory at the University of California, Berkeley, announced that they are teaming up to build the first major telescope largely dedicated to searching for other civilizations.

The privately funded telescope, called the One Hectare Telescope or 1HT because it will measure 100 meters on a side, has a design as ambitious as the search it will conduct. To be built in the next 5 years or so, probably at Berkeley's Hat Creek Observatory in northern California, it will match the sensitivity of a single giant dish by combin-

ing the signals from 500 or more dishes just 3.5 to 5 meters across—essentially off-the-shelf satellite TV antennas. The design will allow the telescope to be expanded as additional funds become available. And it will cost a fraction as much as a comparable single-dish telescope: about \$25 million,



Talk to me. An artist's conception shows some of the 500 or so dishes that will make up the new radio telescope.

which the SETI Institute is now raising from private sources. "We're planning to put as little money as possible into the antennas and instead to keep making [the system] better at the back end," says Jill Tarter, the science team leader at the SETI Institute.

SETI researchers have long dreamed of having a telescope of their own, able to devote large amounts of time listening for potentially meaningful signals from other sun-like stars in the Milky Way galaxy. And Berkeley was a natural collaborator. William "Jack" Welch, the former head of the radio astronomy laboratory, has just been named to the newly created SETI chair in the astronomy department and is also the vice president of the SETI Institute. Berkeley will design the instrument and pay operating costs; in return Berkeley astronomers will get telescope time for more conventional studies.

The 1HT should let both sets of observers collaborate seamlessly, because its design will allow "multibeaming." By interweaving the signals from its individual dishes in sophisticated ways, the array will make high-resolution observations simultaneously in 100 directions or more to monitor an array of stars for signals from an extraterrestrial civilization while also studying pulsars, the intergalactic medium, and the cosmic background radiation. And to cast the broadest possible net for meaningful signals, the telescope will monitor each source across a wide range of radio frequencies, from 300 MHz up to 10 gigahertz.

The biggest design challenge, says Welch, is the sophisticated signal-processing

circuitry and software needed to combine and analyze hundreds of wide-band signals at once. "We couldn't [build] this before now," says Welch, "but we have every reason to believe that it can be done in the next year or two," when 1HT designers hope to install a prototype array of a dozen or so dishes at

Hat Creek. Other radio astronomers say it won't be easy. But "if anyone can do it, Jack Welch is the one to pull it off," says Woodruff Sullivan, a radio astronomer at the University of Washington, Seattle.

If the funds can be raised and the design challenges overcome, 1HT will allow SETI researchers to search the sky 100 times more efficiently than with the 100-meter radio telescope now nearing completion near Green Bank, West Virginia. The 1HT will also sharpen radio astronomers' dreams of constructing a square-kilometer arrangement of

radio antennas, two orders of magnitude larger than the 1HT, capable of detecting signals—from alien cultures or the inanimate cosmos—fainter than any other telescope on Earth. But even more visionary designs will be needed: With current technology, the cost of a square-kilometer array would rise into the billions of dollars. "The challenge is to build a complete array for less than the square-meter cost of an expensive carpet," says Tarter.

—DONALD GOLDSMITH

Donald Goldsmith's most recent book, *Voyage to the Milky Way*, will appear in May to accompany the two PBS television programs with the same title.

SCIENCE IN SOCIETY

Plan for Divulging Raw Data Eases Fears

Congress dropped a bombshell on the scientific community last fall, when it quietly passed a law that appeared to open up to public scrutiny the data of all federally funded researchers. Now the Administration has drawn up a blueprint for implementing this law that would limit its reach to "published" data used to develop policy. Although relieved, agency officials and scientific groups say the Administration must still clarify gray areas in a rule that threatens to undermine scientists' sovereignty over one of their most precious resources: raw data.

Slipped into the 1999 omnibus spending bill by Senator Richard Shelby (R-AL), the directive requires that the White House Office of Management and Budget (OMB) amend

CREDIT: SETI INSTITUTE