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UPDATE: RENOVATION PROJECT

Since we learned that there was a possibility of Bob Stephens joining our effort from the wilds of Canada, we have wrestled with the problem of his housing while here. Bob felt that be would like to stay on-site if possible.

After looking into the costs of housing in the immediate area, it became clear that this would in fact be the most cost effective. It was therefore decided to renovate the north half of the RO office building into a comfortable apartment. To this end, Richard Smith, a carpenter of Dr. Barnhart's acquaintance, agreed to perform the labor, under the agreement that we would pay him up to $1350.00. If the project was to cost more, Dick agreed to donate the necessary time to complete the project.

During the renovation, many items of furniture and carpeting were donated to the new apartment by Dr. Dixon and Dr. Barnhart. John Ayotte arranged for the donation of 2 brand new refrigerators, as well as a brand new electric stove, through his company. This resulted in a tremendous savings.

As far as the renovation itself goes, it finished out to be a first class job; looking as good as any of the newer apartments in the area. One of the few problems that cropped up was one of potable water. Many options were discussed. The one agreed upon and finally implemented was a large polyethylene storage (initially suggested by John Kraus) tank housed in an out building attached to the office building. The extra plumbing required of this solution ran the NAAPO account a bit over budget, but we still managed to cover everything.

Another problem solved by volunteers in this project was painting. Obviously, much of the new apartment would have to be painted, and we could not afford to hire someone to do this.

In response to this situation, Ron Huck & Steve Brown both did a lot of painting. Also, John Ayotte's son's Boy Scout troop came to our rescue; supplying us with Ken Ayotte, Rob Hite, Scott Wilson, and Andrew Watts for an emergency painting session. Ken, Rob, and Scott are all with Troop 98, in Gahanna; and Andrew is with Troop 776, in Gahanna. We all would like to extend a heartfelt "Thank You" to Richard, Ron, Steve, John, Ken, Rob, Scott, and Andrew for all they've done to help bring this project in as close to the projected cost and time as possible. It couldn't

have been done as easy without you!

MOUNT GRAHAM OBSERVATORY WINS LEGAL ROUND

In mid-December a US court of appeals in San Francisco ruled that the University of Arizona may proceed with construction of the Mount Graham Observatory, despite concerns voiced by environmentalists over the fate of the red squirrel, an endangered species. The court found unanimously that legislation adopted by Congress in 1988 exempts the first phase of the project, in which three telescopes are to be installed, from further environmental review.

The appeals court remanded two points still in dispute back to a district court, which in the meantime also has found in the university's favor. While those points may be appealed again, university officials are beginning to sound confident that they will prevail and that construction will proceed without further hitches.

The University of Arizona still is seeking a new cosponsor or cosponsors for the Columbus Telescope Project, one of the three telescopes slated for Mount Graham. While it has received expressions of interest from several institutions, a firm commitment has yet to materialize.

Before Ohio State's withdrawal from the Columbus project, the plan was to start work on the Columbus mirror soon after a 6.5-meter mirror is cast this winter for the conversion of the Multiple Mirror Telescope to a single-mirror telescope. The MMT, located on Mount Hopkins in Arizona, is run by the Smithsonian Institution and the Universitv of Arizona.

PHYSICS TODAY; FEBRUARY 1992; p 89

2-1-92 MEETING NOTES

The meeting began at roughly 10am. Those in attendance were Barnhart, Campanella, Phillips, Childers, Dixon, Janis, Brown, Hanson, and Dixon's guest Jim VanProoyen, from Grand Rapids, MI.

The meeting started out as a working session, removing some furniture to the apartment in the RO. Dixon brought 2 large trash cans, to donate to the apartment. He announced a communication from Bob Gray regarding the WOW signal. Bob G. feels that it might match a signal sent from a nearby star. Dr. Kraus feels it may not have been possible to measure the optical Doppler shift to the required degree of accuracy. It turns out we can, therefore the possibility is there. He also received an invitation to speak at an astronomy camp in Wilma, Ohio on SETI. Re also reports that the preliminary report written by Brown and Klein has been sent in to NASA. Brown has been busy on the proposal, therefore has had little time to spend on site. He and Hanson did some work on the 11/750 at Dreese, getting the RL02 drives to function, and moved some data from them to magnetic tapes. Jim VanProoyen may be able to obtain some VAX parts for us in his travels. Hanson would like to change his strategy of card reading to a much slower rate, in order to lessen the amount of damage being done to cards now being read at high speeds. Janis is pursuing getting the VAX at Dreese on the campus maintenance program. Be will also try to read a box of cards after the campus people have gone over the reader. Childers has not been able to repair the scissors on the ground plane. The born cart is still not movable so far because of this. Barnhart reports that the carpenter has completed the apartment renovation as of 2/3, and Stephens can move in anytime now. The cost overrun was primarily due to the construction of the out-building to house the large water tank. The meeting broke at roughly 11:30pm, with most going off to their respective tasks.

2-15-92 MEETING NOTES

The meeting began at roughly 10:10am. Those in attendance were Dixon, Barnhart, Phillips, Werden, Ayotte, (John), Ayotte, (Ken), Janis, Childers, Campanella, Brown, and Hanson.

Barnhart submitted the RO Remodeling Expense Summary. Around $7500.00 has come from the NASA account; NAAPO contributed around $4600.00; and appr. $4100.00 comes from various donations. He has also received a letter from Dennison University indicating that there is an astronomy club there that would like to volunteer to the RO.

Bob Sickles has sent a letter with a $25.00 donation (thanx Bob!).

The water shed will require a coat of paint for protection from the elements.

Dixon reports that Bob Stephens has spoken with Dr. Kraus by phone, indicating that he may be up early next week to inspect the apartment. Bob also sent a contract proposal, which included some points that will require further discussion and clarification.

We also need to get rid of all the trash we have removed to the outside.

Brown has replaced a faulty RL02 drive in the 11/750 at Dreese, and almost immediately another one failed. He has also connected some floppy drives to it, and taken continuum and log files from the RO to that computer, and is putting that info on mag. tapes. He will attempt to remove a lock from one of the doors at the RO today that is not currently being used, and place it on the new watershed.

Childers has ordered a clock/calendar for the NCR computer in the focus room. This gives battery backup time to that computer, instead of having to enter it manually.

He has not recently caught anymore satellites; there may be either local RFI or a malfunction is the equipment causing this.

Hanson will be talking with some DEC experts soon, and will ask them about some

of the problems we are experiencing with our equipment.

Campanella reports that he and Hanson have discussed the possibility of using a fax machine to read punched cards.

Ayotte reports that his son has completed a school report on the effects of sunspots on 21cm radio emissions. His son built his own antenna for the project, as well as modified some receiving equipment. The report is quite good; surely an "A" job!

The meeting broke at roughly 11:23am, with most going off to their respective tasks.

THE OHIO SETI PROGRAM
A BRIEF HISTORY
1990
Robert S. Dixon

The Ohio SETI Program got its first strong impetus from NASA's Project Cyclops. The goal of Cyclops, which was a paper study conducted in the 1970's, was to assess what it would take in terms of time, people, equipment, and money to mount a large search for radio signals from other civilizations. The end result was a report that was widely circulated as a NASA Special Publication, recommending a small array of radio telescopes, which would grow with time as needed.

During my project Cyclops research, it became clear to me that many theoretical papers were being written about SETI, but nobody was doing any extensive actual searching. I also realized that we had a large, fully operational radio telescope available at Ohio State that was designed explicitly to search for new radio signals in the sky. (It had just completed the largest all-sky survey of natural radio signals made up to that time.)

Coincidentally, this telescope was also chosen by the Russian scientist Gindilis, as the telescope most suited for SETI, because of its unique surveying ability.

Although we had no money, we had a crew of able volunteers on hand. Faced with the alternative of ultimately turning off the telescope and letting it rust away, we decided that we had a responsibility to seize the opportunity that had been thrust upon as and start a real SETI program. It did not take too much arguing to convince

John Kraus, Director of the OSU Radio Observatory, to allow me to use the telescope for the world's first fulltime SETI program.

The Ohio State Radio telescope is larger than three football fields in size, and equivalent in sensitivity to a circular dish 175 feet in diameter. The beam of the telescope is elliptical, being 40 minutes of arc in the declination (vertical) direction, and 8 minutes of arc in the right ascension (horizontal) direction. This may be visualized by comparing it with the size of the moon, which is a 30 minutes of arc diameter circle. The telescope surveys the sky by remaining stationary and allowing the rotation of the Earth to sweep its beam in a narrow circular path through the sky once each day.

After a few days of observation, the beam is moved slightly up or down, and the pattern repeated. It takes several years to thoroughly search the sky.

We went on the air in 1973, using an eight channel receiver system, originally constructed for 21-cm. hydrogen line observations by Bill Brundage (who later became Chief Engineer of the 300 foot telescope at Green Bank, and still later was responsible for preparing the Very Large Array to receive Voyager spacecraft signals from Neptune). The bandwidths of the channels ranged from 10 to 50 kHz, depending on their distance from the center frequency. The output of the eight channels was plotted as wiggly lines on pen recorders.

The charts were laboriously searched for unusual signals by graduate student Dennis Cole (now a contractor to JPL), and used as the subject for his master's thesis in Electrical Engineering. This may have been the first graduate degree ever awarded in SETI.

The search strategy chosen then was to search in the vicinity of the 21 cm hydrogen line, Doppler correlated to the Galactic Standard of Rest. Due to the random motions of the stars and the rotation of our galaxy, signals transmitted at the hydrogen line frequency (1420.4056 MHz) would be received at somewhat different frequencies because of the Doppler shift. To avoid this frequency ambiguity, we made the deliberate assumption that any civilization transmitting at the hydrogen line would offset their transmission frequency in just the right way to remove all their motions with respect to the center of the galaxy, which is the only unique reference point shared by all the galactic inhabitants. Then it was up to us to offset

our receiver frequency to compensate for Earth's motions, to arrive at this unique "galactic" frequency. Because of man's uncertainty about our galactic rotation velocity (we measure it by observing the motions of the stars and gas in our neighborhood), we still had to search a total bandwidth of several hundred kHz. A lot of chart paper was generated during the two years this effort continued, but no recognized signals of intelligent origin were found. By 1975, a 50 channel filter bank receiver had been borrowed from Green Bank (NRAO) and software for the already old IBM 1130 computer had been developed by Professor Jerry Ehman (now Chairman of the Mathematics Department at Franklin University) and me, to process all 50 channels continuously. The software was sophisticated, with many internal checks for false alarms and equipment malfunctions.

Each of the 50 channels was processed independently, and the computer automatically removed the individual gain and baseline variations of each channel. A number of search algorithms were run simultaneously, including searches for both isolated pulses and continuous signals which rose and fell in intensity in just the predicted way (for a continuous, narrowband signal) as they passed through the antenna beams.

The highly processed output data was printed every 10 seconds for all 50 channels, and signals the computer thought were "interesting" were also flagged and saved on punched cards for later analyses.

The old IBM computer was built like a battleship and ran without fail for many years. Its operating system could run huge programs in a tiny memory very efficiently. It was fast, even by today's standards.

Over the years, a few cold hydrogen clouds were found, and huge piles of computer printouts accumulated. There was no magnetic tape drive or equivalent device available, so there was no way to record all the data permanently in computer-readable form. Only the small fraction of data represented by the "interesting" signals was preserved in computer-readable form.

Along the way, a small NASA grant was received, which continues today.

Two types of unexplained signals were detected during this search. The first kind is quite rare, with the best example being the "Wow!" signal found in 1977. This name

was unintentionally applied from Jerry Ehman's comments in the margin of the computer printout when be noticed the signal. The signal was unmistakably strong, and had all the characteristics of an extraterrestrial signal. It was narrowband, and matched the antenna pattern exactly, indicating it had to be at least at lunar distance. (A signal from a nearer object would show a wider pattern.) But it was not coming from the direction of the moon, or any planet, or even any particular known star or galaxy. Of course, there are always many distant stars and galaxies in the beam of a radiotelescope all the time, but that is not significant. A check of manmade satellite data showed that no publicly known earth satellites were anywhere near the position of the signal source. Furthermore, the frequency of the signal was near the 1420 MHz hydrogen line, where all radio transmissions are prohibited everywhere on and off the earth by international agreement.

We searched in the direction of the "Wow!" signal hundreds of times after its discovery, and over a very wide frequency range. We never found the signal again. It was gone. In fact, while we were receiving it the first time, it turned off as we listened.

The radio telescope actually receives two beams from the sky at once (somewhat offset in direction from each other), and subtracts one from the other to cancel out terrestrial radio interference. Objects in the sky are usually received twice with a slight delay, once in each beam. But the "Wow!" signal was received only once, indicating either that it turned off after the first bean received it, or that it turned on after the first beam had passed it.

What was the "Wow!" signal? Probably we will never know. Conceivably it could have been a secret military satellite in solar orbit, transmitting on an illegal frequency (military transmitters often ignore civilian agreements). Its characteristics rule out any terrestrial transmitter, or any near-eartb satellite or reflection from space debris, or equipment malfunction. Perhaps it was a transmission from some other civilization. If so, it seems that they were not trying very hard to attract our attention, since the signal disappeared before we could really find out what it was.

The other kind of unexplained signals we receive are much more numerous. These are narrowband pulses (lasting less than 10 seconds) which go "bump!" in the night. There have been thousands of such signals received, apparently from all over the sky, and never from exactly the same direction more than once. Clearly these

signals are not from any single source (intelligent or otherwise), but they are very interesting in their own right, and could be some form of previously unknown astrophysical phenomenon. Of course pulsed signals like these could easily be caused by terrestrial radio interference or equipment malfunction. But if that were their source, then they should appear randomly scattered across the sky. The interesting thing is that they do not. They exhibit a zone of avoidance along the galactic place, and areas of concentration above and below the galactic center, along the galactic north and south polar axes. It is possible that the zones of avoidance and concentration are caused in some complex unknown way by an interaction between the galactic continuum radiation and the automatic gain and baseline correction algorithms in the computer. We simply do not know.

A resurvey of a portion of the same area shows roughly the sane effect, so the phenomenon appears to be repeatable. We plan to resurvey this area again with all new equipment in the future.

At one point, there was danger that the telescope would be destroyed. The land under and around the telescope was sold without our knowledge to a developer who wanted to enlarge the neighboring golf course. The developer wanted the telescope torn down and completely removed. This created a furor that was widely reported in the world press.

After great struggle and with help from many people, the telescope was saved and a long-term lease was signed for the land.

For several years, we published the first and only SETI magazine, called Cosmic Search. Its editorial board included all the world-wide luminaries of SETI. The magazine was a technical and popular success, receiving great praise on all fronts. But it was a financial failure and finally folded after the thirteenth issue.

In the mid 1980's, a new and more powerful computer was donated by the Digital Equipment Corporation, and we began what we knew would be years of effort to place it into operation in the next generation of the Ohio SETI program.

Unfortunately, while this development was proceeding, the old IBM computer came to a premature death at the bands of a mouse. The mouse built a nest at the air intake to the disk drive, and cut off the air supply. This caused the disk drive to

destroy itself. IBM said the computer was so old that it would cost a lot of money to fix it, and they would not guarantee it to work normally even after it was fixed. So, regretfully we abandoned the IBM computer to devote all efforts toward getting the new DEC computer operational.

During the years of 8 channel and 50 channel observations, we accumulated more on the air SETI observing time than all earlier or contemporary SETI programs combined. The new system (soon to be in full operation) has many improvements over the earlier one.

No assumption as to exact signal frequency is made, as the entire water hole (1.4-1.7 GHz) is searched continuously in 3,000 channels. When a signal is found the search is temporarily suspended, so that the signal may be examined immediately in great detail, and studied for an hour or so. This avoids the problem encountered by other SETI programs where interesting signals are found after-the-fact as part of a systematic search, but are no longer there when pre-observations are attempted.

An on-line catalog of known Radio Frequency Interference sources is maintained, and used by the computer to ignore them.

A new type of radio telescope is being designed, and a small prototype has been successfully tested. This telescope is called a Radio Camera, since it forms an image of the entire sky at once. This avoids the possibility that a signal might arrive from an unexpected direction, but be missed by radio telescopes that are looking in "likely" directions.

Jim Bolinger wrote his master's thesis describing the prototype, and plans are now being made to build a such larger one. We have named this the Argus telescope, after the mythological being that had 100 eyes and could see in all directions at once.

The Flag of Earth flies at the OSU Radio Observatory, as well as many other SETI locations around the world. It symbolizes the fact that SETI is carried out on behalf of Humankind as a whole; and the individual people, organizations, or nations involved are not relevant.

NAAPO Account

The NAAPO account has been drained paying for the apartment project. If you have ever felt like making a monetary donation to the RO, now's the time! We are in desperate need of a few dollars to purchase a few more necessities to complete the project. Please help if you can!

OSURO - - - - - SETI PROJECT UPDATE

RUSS CHILDERS

For the past six months or so, an active SETI program has been running at the OSURO. The system follows up on detected radio sources in realtime, thus eliminating the need for a human operator to be continuously on site.

The current system uses the 50 NRAO 100 kHz receivers and 12 10 kHz receivers to sample the 1.4-1.7 GHz band of the "waterhole".

If the response of a 100 kHz channel matches that of the OSURO's antenna pattern, the 12 10 kHz channels are used to analyze that 100 kHz channel. If a signal shows up strongly in only one of the 10 kHz channels, the feed horns are moved to anticipate the signal again. The feed horns will continue to move until the signal is no longer detected.

During the followup, an audio recorder tapes the output of an ICOM receiver which has been tuned to the frequency of the detected signal. A hard copy of the 10 kHz channel values is made for later analysis.

Currently, the system is still being shaken down. We have been observing only -13 degrees declination and have not used liquid nitrogen to cool down the front end.

Nevertheless, we have made some detections. We have detected the galactic plane and the sun — they show up as strikes on many 100 kHz channels simultaneously. These are "broadband" strikes. The system has also detected narrowband sources.

A signal generator provided by William Lonc puts out a weak, narrowband, 1422.5 MHz signal. This signal can he turned on and off such that it simulates a source passing through the antenna beams. GLONASS global positioning satellites have been detected at 1680 MHz. As of yet, no point source, narrowband, constantly

radiating, celestial source — the ETI candidate — has been observed.

I am presenting the work I've done above in my Master's thesis. It was not my intent to conduct a complete survey of the sky: I wanted to get the system operational and reliable; to conduct tests which would provide the operating parameters of the system.

I have recently had the honor of being granted GRA support from the OSU EE department.

Until January '92 I had been a part time university employee. I will be working along with Bob Stephens when he comes to the OSURO.

OSURO --- SYSTEM CALIBRATION PROJECT UPDATE

STEVE BROWN

I have been asked to write up a description of the experiments which Russ and I performed with the "Lonc custom signal squirter"; the 1422 MHz transmitter that we have at the RO. Russ worked out a control circuit to switch the power to the transmitter in phase with the Dicke switch control voltage. That is, the transmitter is powered when the switch is set to the west horn and off when the switch is set to the east horn. (The sense of this pattern can he reversed by reversing the connection to the control circuit). The fact that the transmitter signal arrives at both horns with the same amplitude doesn't matter then, because the transmitter is on when the receiver looks through one horn and off when the receiver looks through the other. Instead of being canceled out because the signal appears equally in both horns, the signal appears in only one horn and is accepted. When the control circuit was working, we positioned the transmitter at the base of the parabola. Using the cable strung under the groundplane last summer by the folks from St. Vincent's, we connected the transmitter to the control circuit.

The results? Basically, it worked well. The receiver detected a narrowband signal at 1422 MHz and the phase detector output went to maximum, indicating that the signal is properly phase-correlated to the Dicke switch. (The continuum receiver also detected it, and the chart recorder pen swung to one side of the chart). When the connection to the control circuit reversed, the phase detector output reversed sign (and the chart recorder pen swung to the other side). The drawback: it was difficult or impossible not to saturate the receiver. Even with the signal squirter

positioned to produce the wrong polarization, and with it down in the "snake pit" with the lid shut, the receiver was indicating the strongest signal that it can; (we did not try the box on the far side of the parabola's screen). By varying the position of the cart, we could weaken the signal slightly, but this was somewhat tricky. Conclusion: The basic principle is sound. But it cannot be used to diagnose the computer because the signal is so strong it causes 'A/D errors' at the computer. Before this will be a really useful diagnostic tool, some way must be found to tone down the squirter's output. There are a couple of ways to do this. We can vary the duty cycle of the transmitter; that is, instead of leaving it on for the whole time the receiver is looking through a particular horn, turn it on for only a part of that time. The average energy will be reduced in proportion and the receiver's integration time is long enough to smooth this out. We should be able to cut the power by at least 10dB, perhaps 20, before the 'on' time is too short for the transmitter to operate stably. There are 2 problems with this: 20dB of attenuation may not be enough; and the receiver front end will still be saturated (even though the receiver as a whole is not) however briefly, which may distort the results. The solution to these problems is to control the transmitter at some intermediate stage inside it, instead of at the power leads. There the duty cycle can be made very small, and it should be possible to cut back the peak power output as well. Some filtering may be necessary to prevent IF from leaking into the cable under the groundplane and radiating from there. In the near future, I will open up the signal squirter and look at it's circuit to see how this is possible (unless someone beats me to it — don't be put off). A volunteer is welcome to take over this job. Another job a volunteer could do is to construct a weatherproof enclosure to house the transmitter at the far ead of the groundplane. It needs to be large enough to house the signal squinter, batteries, and a bit of ancillary electronics. I'd be glad to consult on the requirements. Ideally, this enclosure should be tightly sealed aluminum, but I think that exterior plywood or particle board, properly painted, would be nearly as good. For electrical shielding, we can line it with aluminum foil (i.e.,groundplane foil) or aluminum sheet.

Editor's Update

Since Steve penned this article, Bill Lonc, at St. Mary's University, Halifax, Nova Scotia, the original builder of the signal squirter, has installed a mains power supply and greatly attenuated the radiated power from the antenna. It is now interfacing much better with our equipment.

COORDINATOR'S CORNER

After three months of nearly superhuman effort, the living quarters at the RO are now ready for occupancy. Initial estimates of the cost have been exceeded by over 100%. The difference has been entirely covered by volunteer activity, donations and the limited account of NAAPO. The NASA grant has provided $7500 as was proposed. NAAPO agreed to underwrite the carpenter's labor cost. The decision to house the potable water supply adjacent to the headquarters building was made when the estimate of cost was within the balance in the NAAPO account. The additional $5000 for this project has been covered by the generous donation of $2850 in labor by Dick Smith and the exhaustion of the NAAPO account. If you have been thinking of contributing to the cause of SETI and find yourself too far from Big Ear to provide direct labor, NOW IS THE TIME TO HELP BOLSTER THE KITTY!!! A $20 donation from each subscriber who has not contributed in the past year would return as to pre-construction solvency. A few dollars more would assure future activity that will surely be necessary. Remember, ALL donations go to observatory activity. Administrative activity is ALL donated or volunteered. Send Checks to:
NAAPO/OTTERBEIN
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Thanks in advance
PEB

Mt. Graham cancellation causes chair's resignation

Thursday, February 20, 1992
By Kevin Corvo
Lantern staff wrfter

Eugene Capriotti, chairman of the OSU Department of Astronomy, will leave his post on Feb. 29 in protest of the university's abrupt withdrawal from the Mount Graham telescope project.

Capriotti, who has been at Ohio State for 28 years, and has been chairman of the Department of Astronomy for 14 years, said his departure is the final result of the

decision by the university to withdraw from the telescope project last September.

"To this day, no one has bothered to explain anything to me," Capriotti said Tuesday during an interview.

Capriotti said he has visited several universities, but he is not sure where he will be going after he leaves Ohio State.

I live in Columbus," Capriotti "said: "My life and my family have always been here."

In 1986, Ohio State, the University of Arizona, the University of Chicago and Italy's Arcetri Astrophysical Observatory became partners in an effort to build one of the most powerful telescopes in the world.

Located in Arizona, the proposed telescope would have been the largest in existence capable of making "new discoveries regarding the origin and evolution of the universe — issues that border on the very core of human existence," Capriotti said.

The University of Chicago was forced to drop out and, although the remaining partners were able to modify the project to absorb the loss, Ohio State remained skeptical, Capriotti said.

"It was no secret that there were negative feelings, but I made every effort to comfort them," Capriotti said. "I was working 20 hours a day last summer chairing the department and the telescope project, and it was killing me."

In a letter to OSU President E. Gordon Gee, Capriotti said he had solicited financial assistance from Italy in order to continue the project, as well as substantial revenue from selling telescope time to other universities.

The project required a $15 million initial investment from Ohio State, Capriotti said. However, university officials said Ohio State could only contribute $5 million.

In a July 25 meeting, the University of Arizona accepted the condition of a maximum of $5 million liability to the project by Ohio State.

Arizona officals accepted the agreement in an effort to keep Ohio State involved in

the project, Capriotti said.

"I mean, they stood there and shook hands and said 'We're in'", Michael Cusanovich, vice president at the University of Arizona, told the *Tucson Citizen*, an Arizona newspaper.

However, by the time University of Arizona officials arrived in Columbus for the Ohio State v. University of Arizona football game on Sept. 7, the fate of the project had already been determined by OSU trustees, the provost and Gee, Capriotti said.

"I still have my ticket to the game," said Capriotti, who was informed of a meeting between Gee and University of Arizona President Manuel Pacheco shortly before the game.

At the meeting, Ohio State announced that it was withdrawing from the telescope project.

Ironically, the University of Arizona had used its 30-second halftime television spot to promote the project. "I went home and watched the game on television after that," Capriotti said.

James Garland, acting dean of the College of Mathematical and Physical Sciences, said, "Dr. Capriotti made his whole career here and did a great deal to make it (the Department of Astronomy) a strong program. I know he was very disappointed by the decision of the university to withdrawal. It was a matter of principle, and I respect Dr. Capriotti for taking a stand over an issue that is so important to him."

According to an article in this month's issue of "Physics Today," the University of Arizona is still searching for new sponsors. Several universities have expressed interest, but none have committed.

"It's unacceptable that they kept secrets and kept leading everyone in the project to believe they would continue to support us," Capriotti said. "My only option was to resign."

THE OHIO STATE LANTERN, Thursday, February 20, 1992

NASA to begin search for alien beings on Columbus' anniversary

Tbe Columbus Dispatch Sunday, January 26, 1992

Los Angeles Daily News

PASADENA, Calif. — Using the most sophisticated listening devices on Earth, about 100 California scientists are preparing to launch a search for alien civilizations across the vast oceans of space.

The National Aeronautics and Space Administration's Search for Extraterrestrial Intelligence, better known as SETI, will begin on Oct 12, 1992 — 500 years after Christopher Columbus and his 90 crewmen landed in the New World.

Scientists with the Jet Propulsion Laboratory in the Los Angeles-area city of Pasadena began setting up computerized radio receivers last week at NASA's Deep Space Network radio telescope complex in the California desert near Barstow.

Their 10-year, $100 million mission is based on the premise that somewhere within 100 light years of Earth there is a civilization of E.T.'s who are trying to phone Barstow — or anywhere else that might harbor intelligent life.

"We're looking for an intentional communication from civilizations, technologies on a planet far out across the galaxy orbiting a distant star," said radio astronomer Michael Klein, the laboratory project manager.

"The question is how many intelligent civilizations with some kind of technology exist in the galaxy?" Klein said. "That's what SETI is all about."

Like Columbus, the scientists have been criticized for hatching a wild scheme that doesn't have a chance of working. And the astronomers themselves acknowledge that, like Columbus who went looking for China but discovered two unknown American continents, they might not find exactly what they're looking for.

But like Columbus. thev insist that the search must be carried out primarily because no one knows what is out there.

"Up until now, we've only had the perspective of understanding where we fit in on Earth," said Samuel Gulkis, a laboratory project scientist. "Now we're standing up, and we're asking 'where do we fit in in the rest of the galaxy?'"

He acknowledged there is a slim chance aliens are broadcasting a radio beacon into space, but he said we should at least take a look.

"Think of another planet like Earth that existed 500 years ago, just like Columbus." Klein said. "They happened by chance to have a very close neighbor. They're maybe only 40 light years apart. And by chance they're communicating. Now there's an incentive to try to make contact with others. They've proven to each other that at least two exist."

Critics, like the late Rep. Silvio Conte, R-Mass., have railed against a NASA program that will spend $100 million searching "for little green men with misshapen heads."

Arguing against SETI's $6 million 1990-91 budget, Conte read into the Congressional Record a series of headlines from supermarket tabloids, including "Noah's Ark Was Built by Space Aliens."

"Of course there are flying saucers and advanced civilizations in outer space", Conte said in the House. "But we don't need to spend $6 million to find evidence of these rascally creatures. We only need 75 cents to buy a tabloid at the local supermarket."

"IF WE NEVER SEARCH, THE CHANCE IS ZERO!"

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