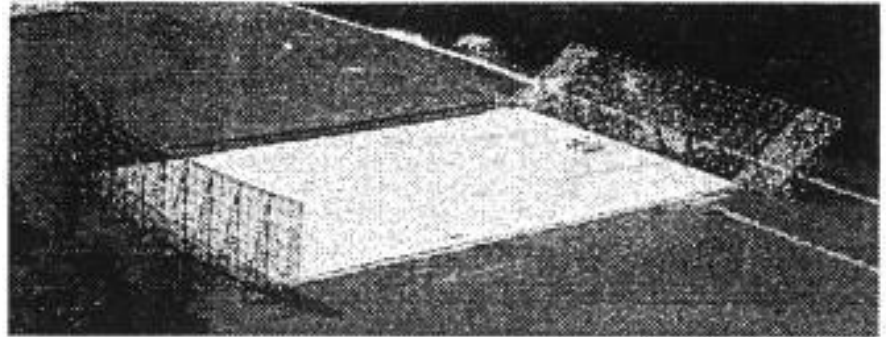




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SIGNALS



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Chief Observer's Report

by: Russ Childers

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May 17, 1996

The declination is -11 degrees, 00 minutes. Seventy one percent of the current survey is complete. This Spring started out cold and clear. This meant quiet, noise-free observing conditions. Suddenly, however, the Spring turned rainy and stormy. This set back the progress of the survey, because I had to extend the time spent at each declination. I prefer to have at least three days' worth of noise-free observation at each observation point. (*Ten seconds per point for the continuum program and twenty seconds per point for the SETI program.*) Rain ruins the continuum observations; at least when the rain comes and goes. Steady rain allows some good data. But rain — and the humidity that accompanies it — that comes and goes affects the two front-end HEMT amplifiers differently. This produces sharp offsets in gain between the amplifiers. This is bad because our system measures the DIFFERENCE between the signals from the amplifiers. If the amplifiers were enclosed in moisture-proof containers, this would not be a problem. But containers have not been constructed to house the amplifiers. We have a single container designed to house both amplifiers, but this requires that coaxial cables be run from the feed horns to the amplifiers. These cables need to be extremely noise-free, because the amplifiers magnify the feed horn signals by 10,000 times. If any noise is generated by the cables, this is also amplified by 10,000 times. Simple thermal noise, produced by the

ambient heat, is enough to greatly increase the amplified noise. We could get around all this by cooling the cables and the amplifiers with liquid nitrogen. This requires constant maintenance, monitoring, and replenishing of the coolant, which is not possible with no full-time paid staff and a low budget. Thus, pray for no rain!

We have created four CD sets of **SETI** data from the **LOBES** (*LOw Budget ETI Search*) system. Ken Ayotte has been instrumental in this task. About five weeks' worth of data fits onto a CD. Ken has diligently taken ZIP disks and produced CDs at his high school. This preserves the data for present and future generations to analyze. I have written a program which replays the data in an attractive display. It is amazing how beautiful seven properly-chosen colors can look.

The **SERENDIP** system has been running only for demonstration purposes. Bill Brown, **SERENDIP**'s custodian, has undoubtedly been busy with his masters-level classes.

The recent Open House, held on May 11th, brought hardy citizens to the observing site on a dreary, drizzly, cold day. Spirits were not dampened, however, when it came to taking radio pictures. People bravely stepped forward, with \$1 donations in hand, to take the once-in-a-lifetime experience of having their body temperatures taken by Big Ear. Thanks go out to the chilled bodies and spirits of Tom Hanson, Jerry Ehman, and Ron Leeseberg, who joined me in entertaining open-housers outside on that dreary day. Steve Brown and Bob Dixon were with us in spirit, but not in temperature, as they lectured at their respective posts in the Focus Room and Office Building.

For those of you who have been following the exploits of my three turtles, now out of their hibernating bliss at Big Ear, there is no news except that they have voracious appetites. I keep them in an 80 degree Fahrenheit aquarium with a sunning area for drying off. The lone female turtle has shown no desire to lay eggs, but a watery nest holds no allure. The aforementioned cold weather has prevented me from placing her in a sandy area outside. I hope that the weather will warm soon (*as it now appears to have done*), so I can place her in an environment more conducive to egg-laying.

Saturday, 4/6/96 Meeting Report

By: Tom Hanson

We had a full house on Saturday, April 6th. The discussion underway when I arrived was of Dr. Kraus' adventures in trying to implement some advanced computing technology. I gather that the ultimate result of this effort will be a World Wide Web site. It would not surprise me if such a site were to become quite popular with a variety of interest groups, as well as members of the general public. During the course of the meeting, Dr. Dixon received a call from Bob Gray of Chicago, who was travelling down this way with his family. Bob did arrive before everyone had departed, and Russ Childers gave a special tour for the Grays.

Attending today were: Cindy Brooman, Earl Phillips, Jerry Ehman, Michael Brooks (*), John and Ken Ayotte, Joe Mitchell, Russ Childers, Mark Sundstrom, Dr. Dixon, Don James, Ang Campanella, Dan Fleisch and Steve Brown. On this occasion, everyone had a report.

After the meeting, in addition to the Gray family tour, there was a demonstration of a portable disk drive. This equipment was connected to the Ron Leeseberg software distribution PC, and the 850 megabyte drive worked immediately and perfectly through the parallel port. This drive is available for just over \$300 from ValueStor.

As a reminder, any Radobs member desiring a copy of advanced Homenet software can obtain copies by visiting the Observatory with a supply of 3.5" high density Dos diskettes. The PC will be removed when Ron returns from Florida.

Mark Sundstrom has been travelling. He planned to pick up more current data from Russ Childers after the meeting.

Tom Hanson described the use of a portable disk drive from ValueStor, for creation of a CDROM disk at Kinko's on Kenny Road. The cost of the Kinko's service is \$75 for a Master disk, and \$35 for each copy, and thus is not for everyone.

Russ Childers reported that the Flat Reflector is positioned at 7 degrees, 20 minutes. He reviewed his attempts to observe the recent comet, and informed us that he sent a ZIP floppy disk of data to Herb Johnson, covering the passage of the comet. Russ has improved his offline **LOBES** display, and he demonstrated the simulated 'real time' quality of the display, using a laptop with color display. The segment of data

included "Radio Sun Dogs", as reported on previous occasions. Seven more Zip disks of data were turned over to Ken Ayotte. Ken will be writing CD set Number 4.

Joe Mitchell led a discussion of planning for the May 11th Open House. Ang Campanella may be out of town, but he will consider how he might adjust his schedule to allow him to be present for part of the event. There was a discussion of hours for the event, and it was decided that publicity should state hours are from 1 PM until 4 PM. It was felt that overflow and late coming visitors will insure we will be working through to 5 PM. Joe will order more T-shirts. He said that surprisingly, the cost of these shirts has actually decreased. Finally, Joe will look into making new postcards, to augment the rapidly diminishing supply of the long post cards which have been so popular in the past.

Ken Ayotte passed around a letter, announcing his selection to receive a \$100 award from the International Society for Measurement and Control. He described preliminary results from his new corner reflector antenna in looking at the sun at 612 MHz. The beam is much better defined than was true with his earlier design. Bandwidth is 6 MHz.

John Ayotte turned over to Cindy Brooman a diskette containing translated files from scanned-in "*Cosmic Search*" articles. Articles scanned are from Volumes 1 and 3. John said that he found his software produced excellent results when set to 300 dpi, even though the video display looked hopeless. John brought a collection of **Argus** papers, which he turned over to Dr. Dixon.

Mike Brooks has agreed to undertake a restoration of the **RFI** project. He has been talking to Dr. Dixon since last fall. Steve Brown led a discussion of the history of the **RFI** equipment and the original application concept. Mike expressed some interest in the Fortran language with which he will be dealing, after 14 years away from the language. Steve Brown said he and others had already written most of the needed code, to solve a similar problem of working with **LOBES**, when the famous Van Horne gas cloud study was done. Russ Childers added a moment of levity by stating that "All I do is look at the code and figure it out".

Jerry Ehman recently added a ZIP drive to his computer. He solved some problems with the SCSI interface.

Earl Phillips brought one of the CDROM's written by Ken Ayotte, and confirmed

that the disk was readable in both PC and Macintosh systems. Earl contributed a plastic wrapped "Discover Columbus" game for the open house.

Cindy is still looking for volunteers to transcribe text from "*Cosmic Search*". Ang Campanella offered to take an assignment. Anyone wishing to assist with this project before all the articles are transcribed, may reach Cindy at Cindy@point-and-click.com. Cindy briefly discussed "frames", a new WWW capability limited for the time being to those who have access to Netscape Version 2.0. There was an extended discussion of Web page design concepts, loosely relating to a project upon which Cindy is currently engaged.

Dan Fleisch reported that the chess players who took his tour of the Observatory recently were very enthusiastic. Dan also gave a tour for a group of business people who have special interests in areas of interest to Radobs members. Dan has a program at work which converts from latitude and longitude to bearing and distance from one's current position.

Ang Campanella informed us he is continuing to investigate possible Argus antenna design. He then announced that he felt it is time to develop a general plan for **Argus** development. He proposed construction of an 'executive' plan, such as might be output from a PERT design process. It turns out that Ang has experience with the process, including design and construction of an experiment package for a sounding rocket, when he led a group of 8 engineers. John Ayotte proposed use of Microsoft Project, and Ang said he would look into it. A few days later, Ang reported that the deep discounts anticipated by Tom Hanson were **** not **** currently in effect, so Ang will begin working on a paper-based version of the chart.

Don James has been on vacation, but he reminded us once again of the importance of repairing the loose aluminum sheets on the ground plane before the open house.

Following the meeting, Russ Childers gave a tour of Big Ear to Bob Gray and his family, who had driven down from Chicago.

Saturday May 4, 1996 Meeting Notes

By: Tom Hanson

With freshly brewed mug of hot coffee at hand, I am pondering how best to report this remarkable day. Perhaps the best theme would be that when bureaucratic bungling takes place at far away places, individual persons are seen to rise to the occasion, often putting in fine performances and occasionally achieving heights of resourcefulness which are worthy of note on a larger canvas. It is not my purpose here to call unnecessary attention to any particular far away organization, so the organization involved in this day's display of resourcefulness will remain unnamed.

We had a small group on hand for this day's unexpected events. Dr. Barnhart was present, along with Ang Campanella, Jerry Ehman, Cindy Brooman, Joe Mitchell and Russ Childers, to the best of my recollection. There was a chaotic atmosphere when I arrived, and accordingly I failed to record the list of attendees, and in fact, much of anything which happened. Dr. Barnhart finally brought order for brief intervals, but this was anything but a normal meeting.

By all measures, the most noteworthy performance of the day was that of the bus driver who brought a load of visitors from the unnamed organization to the Observatory. Since the unnamed organization had not thought to provide an experienced guide, it is my impression the driver turned onto the oval track which leads to Perkins Observatory. Upon discovering this was not the desired destination, the driver found himself pointed back down hill, with the prospect of risking a barrage of golf balls and the even greater risks of Route 23. He had no idea where the Radio Observatory might be, so he elected to back his bus and full load of passengers up the curved and narrow incline to the Avenue of Pine Trees, which he carefully negotiated, only to find himself at another golf ball firing range. He could at least see the flat reflector by this time, so he completed the two curves from the fence to the parking lot, and arrived at the Administration Building to the cheers of the passengers, and the astonishment of those of us in the midst of planning next week's Open House. The surprise for me was increased by my expectation that the visitors were to arrive after the meeting, but here they were, so we brought as many as would fit into the meeting room, and the rest meandered around the hallways and nearby grounds.

The next person to meet the challenge of this 'opportunity' was Dr. Barnhart, who bravely attempted to resume the meeting, while simultaneously attempting to educate

and entertain the guests. While the physical temperature in the meeting room rose as a direct result of the number of people packed therein, I attempted to entertain or at least distract the 'outside' guests. At a certain point, the outside natives became restless, and I was appointed as an emissary to see if the inside natives were keeping track of the time. The entire busload of passengers had been told they would be back at their starting point by 12:30, and it was beginning to look as though that would not be possible. After a brief negotiation, it was decided to adjourn the meeting, and the next phase of individual performances began.

Jerry Ehman and Russ Childers agreed to provide tour services, and Joe Mitchell and I provided auxilliary services which can best be likened to those of well trained, highly alert, ever moving, roving entities. Once the busload had been divided into approximately equal sized groups, and the tour lectures were well underway (*Russ in the focus room and Jerry on the ground plane*), Joe and I attempted to remove the long cable which ElectroScience Laboratory researchers had strung between the parabolic reflector and the flat reflector. Since Russ Childers has been steadily moving the flat reflector toward the south for the past year, the ESL cable now draped threateningly in the path of our anticipated visitors at the Open House next Saturday. Don James had brought this situation to our attention some weeks ago, and I had come up to this day's meeting equipped with tools to disassemble the U-bolts which my earlier inspection had led me to believe were securing the cable in the middle of the ground plane. We discovered that the cable is continuous, for the entire length of the ground plane, and that the U-bolts I had found were merely holding brackets for radar targets. This meant that One of Us had to climb the flat reflector, so One of Us got the climbing belt from the focus room locker, and made the ascent, while the Other of Us prepared for any eventuality below. Fortunately, it turned out that ESL had secured the cable at the top of the flat reflector with a spring loaded locking hook, secured by a threaded outer ring. While this was going on, Jerry Ehman had taken one of the tour groups to the parabolic reflector, the better to watch the carnage if the safety belt did not hold. Fortunately, the trip back down the ladder was negotiated safely, and Joe and I then coiled the ESL cable back and forth at the foot of the parabolic reflector. During the ladder ascent, Russ and Jerry exchanged tour groups, and at 12:18, everyone prepared to climb back aboard the bus, which the driver then took nose first back down the hill.

In other news: **THE MAY 18TH SATURDAY MEETING IS TO BE CANCELLED.** The Open House will be held on the 11th, and the Dayton Hamvention will take place on the 18th. Since many volunteers will be attending the Hamvention, no

meeting will take place on the 18th.

Russ reports the telescope is positioned at minus 10 degrees even, which is 72 percent of the current north-south pass. Russ found a visitor from Roswell, Georgia, on the Observatory site Wednesday night. This visitor is interested in Big Ear, and Dr. Barnhart will add his name to the "*Signals*" mailing list.

In response to an inquiry from Stuart Kingsley, it was decided to make a Zip Disk copy of the contents of the Radio Observatory Software Distribution PC hard drive. Russ Childers took care of this during today's meeting, and the Zip disk is now available for use by members who are equipped with Zip drives.

Joe Mitchell provided everyone present with copies of flyers announcing the Open House scheduled for May 11th.

GALILEO MISSION STATUS

June 4, 1996

Yesterday marked the start of the return of scientific data recorded by NASA's Galileo spacecraft during its close flyby of Jupiter's moon Io last December 7. The data will be sent back at the rate of 20 to 80 bits per second over the next two-and-a-half weeks.

Among the data being returned are long-awaited measurements of the Io torus, an invisible doughnut-shaped ring around Jupiter populated in part by charged ions of oxygen and sulfur emanating from the volcanic moon Io. The measurements Galileo made of this energetic region are of great interest to scientists attempting to understand the complex interplay of magnetic forces and matter in Jupiter's magnetosphere.

Planning continues for Galileo's upcoming June 27 encounter with the moon Ganymede. Yesterday's data return from the spacecraft included an optical navigation image of Ganymede and a reference star to help fine-tune targeting of Galileo's 844-kilometer (524-mile) altitude flyby of that big moon. Used for navigation purposes only, the image is the product of new computer processing capabilities on the spacecraft that allow Galileo to send back only the information required to show the spacecraft is properly targeted and that the jovian satellites are where navigators calculate them to be.

Ganymede is the largest satellite in the solar system. With a diameter of 5,300 kilometers (*about 3,300 miles*), it is three-quarters the size of Mars.

The return of the Io data and the optical navigation frame were enabled by the extensive new software that was radioed to the Galileo spacecraft last month. Galileo is now equipped to perform its orbital mission with this new software. Galileo is now 10.8 million kilometers (*6.7 million miles*) from Jupiter, and 653 million kilometers (*405.7 million miles*) from Earth. One-way communication time is 37 minutes. Galileo's speed in orbit around Jupiter is 3.2 kilometers per second, about 7,300 miles per hour.

TOPEX/POSEIDON MISSION STATUS

May 1, 1996

The satellite is operating normally and is in cycle 133 of data collection. Each data collection cycle is 10 days long.

The science data team reports that the Sensor Data Records and Interim Geophysical Data Records (*IGDRs*) for cycle 132 have been completed. After archiving and packaging, the IGDRs will be sent to the Physical Oceanography Distributed Active Archive Center at JPL.

Dr. Dudley Chelton, a TOPEX/Poseidon science team member at the College of Oceanic and Atmospheric Sciences at Oregon State University in Corvallis, reported in *Science* magazine last month that he is using TOPEX/Poseidon data to track Rossby waves as they move through the open ocean. He reported that scientists have determined that, at mid-latitudes, the Rossby waves are moving two to three times faster than previously thought. Rossby waves are large-scale ocean waves, with wavelengths of hundreds of kilometers from one wave crest to the next. These waves carry a "memory" of weather changes that have happened at distant locations over the ocean.

ULYSSES MISSION STATUS

May 1, 1996

All operations and science experiments continue to go well aboard the Ulysses spacecraft as it heads for the orbit of Jupiter. NASA's tracking facilities near Madrid, Spain and at Goldstone, Calif., continue to monitor the spacecraft about 12 hours a day.

Today Ulysses is about 41 degrees north of the Sun's equator, traveling at a heliocentric velocity of about 52,000 kilometers per hour (*32,000 miles per hour*) with respect to the Sun.

Ulysses will reach Jupiter's distance of 5.4 astronomical units (*about 800 million kilometers or 500 million miles*) from the Sun on April 17, 1998. Once there, the spacecraft will loop around and return to high latitude regions of the Sun. In September 2000, the spacecraft will begin its second solar orbit, which will take it over both poles of the Sun.

VOYAGER MISSION STATUS

June 1, 1996

Voyager 1 is currently 9.33 billion kilometers (*5.79 billion miles*) from Earth, having traveled 11.23 billion kilometers (*6.98 billion miles*) since its launch in September 1977. The Voyager 1 spacecraft is departing the solar system at a speed of 17.42 kilometers per second (*38,976 miles per hour*).

Voyager 2 is currently 7.20 billion kilometers (*4.47 billion miles*) from Earth, having traveled 10.61 billion kilometers (*6.59 billion miles*) since its launch in August 1977. The Voyager 2 spacecraft is departing the solar system at a speed of 16.03 kilometers per second (*35,857 miles per hour*).

Both Voyager spacecraft are healthy and continue their departure from the solar system. As they travel farther and farther from the Sun, the two spacecraft are returning data to characterize the outer solar system environment and search for the heliopause boundary, the outer limit of the Sun's magnetic field and outward flow of the solar wind.

Each Voyager spacecraft has seven science instruments returning data. However, the

sensitivity of the plasma instrument on Voyager 1 is severely degraded, limiting the scientific value of the data. The spacecraft are collecting data on the strength and orientation of the Sun's magnetic field; the composition, direction and energy spectra of the solar wind particles and interstellar cosmic within the outer heliopause. These data are transmitted to Earth in real time, at 160 bits per second, and captured by 34-meter Deep Space Network stations. After transmission of the data to JPL it is made available in electronic files to the science teams located around the country for their processing and analysis.

Flight controllers believe both spacecraft will continue to operate and send back valuable data until at least the year 2015.

GALILEO FINDS GIANT IRON CORE IN JUPITER'S MOON IO

Jupiter's volcano-pocked moon Io has been found by NASA's Galileo spacecraft to have a giant iron core that takes up half its diameter, scientists report in Science magazine. The spacecraft also has detected a large "hole" in Jupiter's magnetic field near Io, leading to speculation about whether Io possesses its own magnetic field. If so, it would be the first planetary moon known to have one.

These newly identified characteristics of Io may be related to the intense heating of the moon caused by the constant squeezing and distortion of Io in Jupiter's powerful gravitational grip, according to Galileo Project Scientist Dr. Torrence Johnson of NASA's Jet Propulsion Laboratory (JPL), Pasadena, CA. Io is the most geologically active body in the Solar System, and though it is less than a third of Earth's size, it generates twice as much heat as the Earth.

"Jupiter's massive gravity field distorts the shape of Io in the same way that tides are raised in Earth's oceans by the gravitational tugs of the Sun and Moon," Johnson said. As Io orbits Jupiter, these so-called "body tides" rise and fall due to subtle changes in Io's orbit which in turn are caused by the gravitational nudges from Europa and Ganymede, other moons of Jupiter.

As a result, Io is squeezed like a rubber ball. Friction created by this action heats and melts rock within Io to produce the volcanoes and lava flows seen all over its surface, and huge geysers that spew sulfur dioxide onto Io's landscape.

The large, dense core Galileo found within Io was deduced from data taken during the spacecraft's flyby within 559 miles of the moon last Dec. 7, as Galileo passed by

the moon on its way to enter orbit around Jupiter. Precise measurements of the spacecraft's radio signal revealed small deviations in Galileo's trajectory caused by the effects of Io's own gravity field.

From these data, Galileo scientists have determined that Io has a two-layer structure. At the center is a metallic core, probably made of iron and iron sulfide, about 560 miles in radius, which is overlain by a mantle of partially molten rock and crust, according to JPL's Dr. John Anderson, team leader of Galileo's celestial mechanics experiment and principal author of the paper published in *Science* today. The core was probably formed from heating in the interior of the moon, either when it originally formed or as a result of the perpetual tidal heating driving its volcanoes.

Galileo scientists also are trying to determine the cause of the hole they found in Jupiter's magnetic field when the spacecraft was closest to Io. "Instead of increasing continuously as the spacecraft neared Jupiter, the magnetic field strength took a sudden drop of about 30 percent," Johnson said.

"It's an astonishing result and completely unexpected," said Dr. Margaret Kivelson of the University of California at Los Angeles, who heads Galileo's magnetic fields investigation team. Preliminary analyses of these data are currently being prepared for formal publication.

"The data suggest that something around Io — possibly a magnetic field generated by Io itself — is creating a bubble or hole in Jupiter's own powerful magnetic field," Kivelson said. "But it's not clear to us just how Io can dig such a deep and wide magnetic hole."

Possible explanations for this signature can only be sorted out using data from all the other space physics instruments onboard Galileo, Johnson said. "We're eagerly awaiting the return of data from the magnetospheric measurements taken during the Io flyby to see if we can resolve this mystery," he said. This data, recorded on board the spacecraft, will be transmitted back to Earth in June or July.

If analysis of this data eventually proves that Io indeed has a magnetic field of its own, it would be the first moon shown to have one. Io would join the Earth, planet Mercury and the outer giant planets as bodies in our Solar System that generate their own magnetic fields.

Other studies conducted by Galileo during its December flyby of Io have provided new evidence that Io is most likely the source of high-velocity dust streams littering millions of miles of space around Jupiter.

In July 1994, Galileo's dust detector began sensing dust streams more powerful than those previously discovered by the Ulysses spacecraft. Dust detectors on Galileo sensed more and more particles during its approach to Jupiter, reaching a peak of 20,000 impacts per day during the longest and most intense interplanetary dust storm ever observed.

These fast-moving particles travel at speeds from 30 to 60 miles per second away from Jupiter — fast enough to escape the Solar System. These dust impacts continued up to the time of Galileo's Io flyby and then ceased, said Dr. Eberhard Grun of Germany's Max Planck Institute in Heidelberg, principle investigator for Galileo's dust detector experiment.

"My preliminary interpretation of these observations is that they support the idea that Io is in some way the source of the Jupiter dust streams," Grun said.

One theory proposed after the NASA Voyager spacecraft flybys in the late 1970s is that dust particles emitted from Io's volcanoes could become electrically charged and then swept away by Jupiter's rotating magnetic field. Recent modifications to this theory suggest that the dust is subsequently accelerated in the magnetosphere and flung outward from Jupiter at high velocity, creating dust streams.

Galileo's next close encounter with a moon of Jupiter will occur June 27, when the spacecraft will pass about 530 miles above the surface of Ganymede. Larger than Mercury, Ganymede is the largest moon in the Solar System. Galileo will make repeated close flybys of Ganymede, Callisto and Europa during its two-year mission in orbit around Jupiter.

Galileo was launched aboard Space Shuttle Atlantis on Oct. 18, 1989. The mission is managed by JPL for the NASA Office of Space Science, Washington, DC.

Additional information on the Galileo mission and its results can be found on the World Wide Web at URL: <http://www.jpl.nasa.gov/galileo/>. To obtain a copy of the Science magazine article (*Dr. John Anderson et al*) reporting the new findings on Io's core, contact the AAAS Office of Communications, 202/326-6421.

Coordinator's Corner

By: Phil Barnhart

The axe has fallen officially. The world now knows what a few of us have realized for some time now. The Ohio State University has taken the stand that astronomical observatories are too expensive to maintain and operate, regardless of historical or scientific usefulness. In 1947 they operated the third largest reflector in the United States (*the Perkins Observatory 69-inch telescope*). Today, the largest telescope operated (*jointly with Lowell Obsevatory*) by OSU is the 72-inch (*the 69-inch with a new mirror*) located just outside Flagstaff, Arizona.

In a field where the name of the game is currently 'aperture', the wisdom of the university has been to distance itself from advances in this area at every opportunity. In 1992 it withdrew from a 1985 commitment to work with the University of Arizona on the Columbus Project — a dual 8-meter optical/IR telescope on Mount Graham. Use of this instrument would increase the light gathering power available to the OSU astronomers by a factor of over 40.

Just this winter, the university opted out of the opportunity to join the Magellan Project, a southern hemisphere instrument in the 8-meter class. This was an opportunity that the University of Michigan grabbed right away. It would have increased the aperture (*light gathering power*) available to OSU astronomers by a factor of 20.

In the radio region of the spectrum, the university has opted to allow destruction of the second largest aperture in the United States (*Big Ear*) just because it is not a big draw for large government or industrial contracts. As we have pointed out before in these pages, great discoveries, more often than not, arise from small projects with world class equipment at their disposal. The politics of university staffing and operations is to emphasize the capture of large research grants to assure the institution can become self-sufficient in light of decreasing state support. The nearly \$1 million income from Big Ear operations overhead (*indirect costs paid by government contracts over the past 15 years*) was simply not enough to satisfy the bean counters and administrators of the university.

On another matter, I would like to mention some comments made by one of our favorite, long time volunteers, Marc Abel. Marc was a volunteer before most of us now associated with Big Ear and was responsible for much of the transfer of software

from the IBM environment of the **SETI** program to the DEC system currently in use. He sends his concern about our public display of cynicism and criticism of the Ohio State University administration. In particular he cites recent comments regarding news releases printed in *SIGNALS* along with samples of the articles that appeared in the local news media.

In particular Marc takes us to task for statements seeming to ridicule the stand taken by the university and pointing out the mistatements of certain members of the administration to the newspapers, (*i.e.*, "*Wrong-and Haverkamp knows it!*" or "*[Haverkamp] also said that the 1960's era telescope is no longer a state-of-the art device.*"). The claim is that if we respond publicly to the stand taken by the university and expressed in news releases by its representatives that we somehow lose credibility and any hope for respect and support from the university.

While I personally agree with Marc about not criticizing "the hand that feeds you" and "keeping the public image of all happiness and light" it is also necessary from time to time to not let the propaganda machine get away with painting the picture it wants the public to see and not tell it like it really is. Just a few items that seem unfair to those of us who were rarely kept informed of 1) the ultimate purpose of the negotiations between the university and the two developers of the land, and 2) not asked by the negotiators for information concerning the true state of affairs at the radio observatory:

1. Someone (*the university attorney did not know whom*) had publicly indicated while the negotiations were going on that the \$265,000 price tag for painting the telescope was not the lowest bid in hand. A memo was sent to Bob Dixon demanding that such information not be bandied about because it would lower the negotiated settlement the university was seeking to get for early release of the developers from the lease contract.

Throughout the long negotiations we maintained what amounted to steady press blackout, keeping important information from even our friends and volunteers! We still feel much of the negotiation and settlement affairs are based upon trumped-up conditions involving the danger of "NASA vials" and arsenic poisoning of the site. The public has a right to know when lies and closed negotiations are used to attain benefit to the university at the expense of one of the most popularly based projects carried out with university facilities.

2. That our "public conduct" (of both the NAAPO and OSU Radio Observatory personnel) has not adequately considered the University's "needs", has been at times "downright rude". I will agree. From 1982 on, the university has dealt with the Radio Observatory in a somewhat less than upright manner. The university release of interest in the telescope to allow Ohio Wesleyan University to sell the land upon which the telescope rests was made without informing nor seeking advice of ANY of the people involved in using the instrument. Not only was this move rude, it was most inconsiderate. Of course the only way this information was made public was by press releases from Observatory personnel and ultimately brought about the negotiation of the first ten year lease agreement with Green Highlands, Inc. — the new owner of the land. Indeed, this rather rude public announcement is what brought Marc Abel into the operation in the first place.

3. The university is imposing unique, strict and arbitrary conditions on its future support of a radio telescope involving the present 'operators' of the Big Ear. The conditions involve multiple departmental involvement — spanning mathematics, physics, electrical engineering, astronomy, mechanical engineering and as many other university colleges as possible; sizable outside support obtained by this 'committee' of research-oriented interested parties; site approval by the university only after the outside support is obtained. Such restrictions are unprecedented in the operation of other research operations of the university. Multi-departmental projects occur, but are not required for university support of research. Though unfair on the surface, this seems definitely aimed at stopping the volunteer association with university facilities.

Thanks, Marc, for your concern. We hope to see you more often as **ARGUS** moves to a new site and the search continues. We have appreciated your association and help over the years and value your input today.

VOLUNTEER PROFILE: Joseph N. Mitchell

ed. note: This is a new feature for SIGNALS. We are going to include a volunteer profile in each up-coming issue. It is our hope to indicate more of what the group has been doing and a good bit about who makes up this organization.



Joe Mitchell came to the project about the same time Steve Janis moved from the chief administrative post to explore the Pacific northwest. Joe ably took over the post and continues to keep up with correspondance, phone calls and the all important interface with the university bureaucracy. He handles the bill paying routine through the university business offices and the Research Foundation. We still spend money left over from the NASA project of a few years back.

He graduated from Mount Union College in 1994 with a Bachelor of Science degree in Physics, Astronomy and Mathematics. In the fall he will enter Case Western's master's program in Electrical Engineering and Applied Physics. He is also planning to get married this summer before launching his graduate studies.

In addition to his administrative tasks, he has prepared and produced a 10-page informational packet to be distributed to those requesting information about the radio observatory. He also has been working on the Punch Card Project to transfer past observatory data from obsolete punch card format to CD-ROM. In particular he has been organizing and checking the electronically stored data with information physically written on the storage boxes before the cards are destroyed. He currently works as shift manager for Kinko's in Columbus and has managed to gain for the project minimum billings for publications such as *SIGNALS*.

Joe had known of the radio observatory by being a resident of Columbus before

going to college. He recalls a field trip to Big Ear while he was in grade school and maintains the feelings of awe first engendered on that occasion. The maintenance of this feeling makes the association with the volunteers of **NAAPO** all the reward he needs.

Joe enjoys the association with the volunteers and claims to enjoy every minute he has spent participating at the RO — even the very cold open house sessions all afternoon on the ground plane explaining the function of the telescope.

We are including Joe's profile early on because he is about to leave central Ohio. As in the past we will miss the active contributions of people like Joe, but are glad to send them on with exposure to a quality research program and the assurance that they are welcome to contribute from where ever they may find themselves. Maybe an **ARGUS** related project can serve as a master's thesis for him.

Good luck, Joe. There is a lot to learn from the universe yet. We all wish you the best and urge you to keep in touch.

[John Kraus Honored at "Hamvention"](#)

SETI League executive director Paul Shuch, N6TX, was the Hamvention banquet "speaker" Saturday evening. Shuch entertained with songs and included numbers about the search for extraterrestrial intelligence, Carl Sagan and the "Big Ear" antenna developed by John Kraus, W8JK, who was among those being honored. AMSAT-NA President Bill Tynan, W3XO, was named the Dayton Hamvention's Ham of the Year. Kraus was a Special Achievement Award winner, and Bill Orr, W6SAI, was named Technical Excellence Award winner. Neither was able to attend, however. Bob Dixon, W8ERD, subbed for Kraus while Joe Schroeder, W9JUV, spoke on Orr's behalf. More than 1000 attended the banquet.

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