NAAPO (North American AstroPhysical Observatory)

"NAAPO News"
Volume 2 Number 6
(December 10, 1986)

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DIXON HAS CLOSE ENCOUNTER OF THE FOURTH KIND

On a routine flight back to Columbus from the Windy City, Bob Dixon had the good fortune to find himself in conversation with none other than OSU's President, Edward Jennings. After some discussion of weather, sports and parking spaces for the faculty, talk got around to Big Ear. Bob discovered that as many have suspected over the years little communication of substance occurs in the bureaucratic quagmire of a large state university.

Pres. Jennings seemed disturbed that he was unaware of the crisis Big Ear is enduring as a result of the squeeze play in the College of Engineering. As a result of Bob's spelling out of the situation, a meeting has been arranged to clarify the University role in the maintenance and support of Big Ear. Details of the meeting and possible aftermath will be reported in the next NAAPOnews.

GROTE REBER RETURNS TO NORTHERN HEMISPHERE

John Kraus has been in touch with Grote Reber who is presently setting up to observe long wave radiation through the ionospheric opening over the magnetic pole. This is a complimentary survey to the one he completed in Tasmania.

Reber is one of the earliest pioneers in the discipline of radio astronomy. Following Jansky's discovery of cosmic radio emission, Reber was the first to attack the problem systematically. His ordeal in becoming recognized by the astronomical establishment and getting a paper published in The Astrophysical Journal are part of the lore of the science. He is undoubtedly a model of the rugged individualist in the community of scientists.

During the glorious years of Big Ear, Grote Reber carried out a project of cosmic ray detection in the laboratory building adjacent to the radio telescope. At that time he was granted an honorary doctorate by the Ohio State University. It is time to start planning to invite Dr. Reber to one of our consortium meetings. We rarely have the opportunity to greet and talk with bona fide pioneers in any scientific field.

COORDINATOR'S CORNER

I have just subjected myself to a discussion of philanthropy (of all things) and the 'volunteer society' in our country. It is very interesting to digest some of the figures (as of 1984, but not significantly decreasing with time) and to realize that NAAPO is a part of this 'big business' aspect of our culture.

Of particular note: Just under 50% of the American population volunteer participation in associations or organizations for significant amounts of time during their lifetimes. Estimating an average of 1 hour per week (about 2% of productive working time -- the same as the proportion of income donated to philanthropic causes -- this yields the order of 3.9 billion person-hours annually devoted to unpaid labor for causes perceived to be worthwhile. Even at minimum wage this amounts to nearly $14 billion in donated labor.

In addition, about $80 billion is donated in actual cash or property. Of this $35+ billion goes to religious causes which may not really qualify as philanthropy, because it may not be 'voluntary'. Far less than $1 billion of this finds its way into support of science. The tradition of scientific philanthropy (Yerkes, Hooker,

Rockefellers, etc.) has been directed toward hardware -- large telescopes or observing sites. Most philanthropy rests upon support of an idea. NAAPO is a pioneering organization in this respect. We seek support for an idea not traditionally thought to be the target of philanthropy. Scientific skills and scientific thought are our main goals.

Over 90% of US philanthropy is from individuals, not corporations nor foundations. So far, NAAPO is representative in this respect.

It is evident that the primary motivation for donating time and money is belief in some cause. We do it to support an IDEA. In evaluating my motivation for investing in Big Ear I have come to the conclusion that I have no trouble with this concept. The idea of science -- embodied in the Charter of NAAPO -- to obtain an understanding of the essence of the universe is strong enough cause to devote a portion of myself to the endeavor. There is a strong indication abroad that if we don't do it, there are precious few who will.

Working session met at my house this time. We adjourned later than usual and there was still discussion going on around 2:30 in the afternoon. Enthusiasm for various elements of the cause runs high among our people. I gather from the comments and conversations that the NAAPO experiment is exciting and that there is much to do.

It is nice that there are a dozen people interested enough to sit down every two weeks and work over these important and sometimes frustrating matters. We have seen very positive results demonstrated at this meeting, and see promise of more to come shortly. We are starting the climb up out of the trench we dug for ourselves last summer when the mouse king dealt us the humiliating blow by building his nest in the disc drive mechanism, crashing us off the air. We are beginning to complete our extended turn-around and will get back to the business of radio astronomy the Big Ear way shortly.

I am thinking about a holiday pause for NAAPOnews following the next Working Session (December 20). Our next issue will probably not hit the mail till following the first meeting of the new year. More later.

---PEB

MIKESELL TO BE OFF HIS FOOT

Toward the end of this month Gene Mikesell will go under the surgeon's meat cleaver to have a bone spur exorsized from his foot. This will give him an enforced vacation which in all likelihood he would rather be spending somewhere else -- even Philadelphia. We all wish Gene a speedy and totally painless recovery.

WORKING SESSION
6 DEC 1986
at Barnhart's

In attendance: Abbott, Abel, Barnhart, Bolinger, Dixon, Engle, Guthrie, Helwig-B, Helwig-R, Huck, Kraus, Mitchell, Mook, Rugare, Saum.

General Announcenents

1. Dixon/Jennings conversation leads to a meeting on Dec. 8. Proceedings will be summarized at a later meeting.

2. Kraus believes SARA 'intermittent' source may be side-lobe based. Big Ear will try to investigate.

3. We have not received much encouragement on our request for PDP 11/44 support as sought in the last NAAPOnews. It looks like business or industry is our best hope for help in this direction.

4. Big Ear is featured on the cover of the Otterbein College Physics Department brochure.

5. Barnhart is going to talk to the Kent State Physics Colloquium on 29 January on the subject of Big Ear and NAAPO.

6. The equipment from St. Mary's was turned over to the Dreese crew for evaluation and implementation. MANY THANKS, BILL LONC! The material is much appreciated.

7. Bill Mook displayed the board from Paul Horowitz known as 'Suitcase SETI'. He

reports the software supporting it is on the way.

STATUS REPORTS

1. Radobs office -- Dreese Labs

a. Bolinger reports 11/23 is running and ready for the interface. He also indicated he has made progress on his 'fish-eye' antenna farm project.

b. Huck displayed the prototype board for the interface. The project is GO. The board looks good, and to the first approximation seems to be working. Good Job, Ron!

c. Dixon volunteered to provide for the Facilities Manual a description of the 11/30 and 11/23 system and operation.

2. Otterbein Office

a. Beth Helwig has been asked to coordinate a project through the Otterbein Technical Writing classes (winter and spring terms) to produce a Big Ear Facilities Manual. This shift in duties will necessitate obtaining another Newsletter editor/writer.

b. Term end chaos has left the NAAPO Coordinator flustered and behind schedule.

c. The Micro Group has established a regular working schedule and will have a routine data monitoring and recording/storage system in operation fairly soon. They estimate we have considerable computing and control power on hand now and should be able to accomplish much in the way of data access and processing independantly of the 11/23 if necessary. They will report regularly to the working sessions.

d. Two new task forces are now initiated. Jill Rugare is coordinating the writing of research proposals. Meetings with Barnhart and Kraus are being scheduled and production is about to begin. Carol Abbott is beginning to set up the Horn Cart System task force. Specific requirements are being assembled and she will be ready to confer with development groups soon.

3. Site Report

a. Kraus and Mikesell succeeded in stretching the east security fence on a cold and windy day in December. Several hundred more wire clips need to be installed and the three strands of barbed wire still need to be strung. Barnhart has some volunteers who can do this before the first of the year.

b. The receiver seems to have some problems. A concentrated effort will have to be made to get it operational soon. [Bolinger and Barnhart installed the Dennison two channel strip-chart recorder on 9 Dec. It seems to work well.]

c. The ESL project continues. The ground plane repair awaits warm weather -- probably like we wi11 see next in May or June.

d. Some security problems seem to remain unresolved.

4. DeVry Institute of Technology

a. The interface drawings are essentially complete. Delivery is due soon.

b. Rugare and Barnhart are scheduled to meet with the administration representative on 12 Dec.

5. Miscellaneous

a. Mook reported on his trip to Boston to get 'Suitcase SETI`. He reports Horowitz gets -- and does not understand -- narrow band anomalies. We are not alone in this respect.

Bill also reiterated his offer for use of the Applications Innovations Lab in its new, expanded location, for testing and development of new circuitry.

Adjournment 12:45 pm

Next Working Session:
at Big Ear

December 20, 1986
10:00 am

DIXON CONTRACT RENEWED BY NASA

Bob Dixon reported at the 6 Dec. working session that he has received word his NASA grant has been renewed. This means he has $15,000 to continue the SETI program at Big Ear.

Though not unexpected, this renewal is quite welcome. It is evident that much of the public response to the threat of loss of Big Ear was tied to the fact that the telescope is engaged in this popular endeavor. The present status of NAAPO owes much to the on-going program supported by NASA.

HAY RIVER WRITES AGAIN

For those of you wno did not get to see Bob Stephens letter at the working session last week I have reproduced the letter for all to read. It is very difficult to find (outside of NAAPO) people with the kind of commitment to a cause displayed by Bob. Carry on, Bob. You're battling against all odds.

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Hay River Radio Observatory
P.O. Box 120.
Hay River, N.W.T.
Canada XOE ORO

Institut EIectromagnetiques Interstellaires
l'Observatoire Radioastronomique d'Hay River

November 19, 1986

Dr. Phil Barnhart
Advisor, IEI
Dept. of Physics/Astronomy
Otterbein College
Westerville, Ohio

USA, 43081

Dear Phil,

Thank you very much for the chart paper and other components. I can use the electrolytic capacitors, but I'll be darned if those old germanium transistors (this is my guess by merely looking at them in reflected visible light) are going to be of much use. Although they might make reasonable temperature sensors.

On future shipments please declare the goods something like, "obsolete surplus, no commercial value". It seems Canada Customs wants me to put money (which they don't yet know that I haven't got) into their pockets. Of course this is rediculous [sic] and typical therefore of a Canadian government run operation.

A) We must at all costs, protect Canadians from themselves.

B) Above all, do not let visionary foreign nationals assist fledgling Canadian programs designed to help Canadians. Canadians are required to accomplish things on their own and without Ottawa's help also.

C) Do not allow foreward progress to be established, especially if engaged in deficit spending.

and finally the solution to everyone's problems,

D) If you need money, go get a job!

Can you please mail me an invoice ASAP stating that the goods are useless and were sent as a gift. Thanx.

I am very pleased to be able to show you the enclosed neutral hydrogen spectroscopy! I have gone through the entire receiver chain since installing the Tap Lum LNAs and I'm afraid this is about as good as can be achieved until someone donates 50¢ that can make it past my mouth and be used to purchase newer equipment. With what might be the best telescope I'll ever build I have heavily engaged myself in a small mapping program which will result in a paper in about 5 or 6 weeks. I'll send you a copy when it is finished.

I recall a comment in an earlier NAAPO NEWSletter made by one of the summer interns, Marks I or II, that while engaged in the mundane preliminary work of upgrading/restoring the telescope that he,"...could not wait to get on with some science". I remember thinking to myself, "These guys don't have much patience", but you must know that I am at least equally eager. It has been some 4 1/2 years working from an initial dream, and two weeks ago my telescope became good enough to do some science. With impending doom perhaps around the next corner, dammit, I don't care, I'm going to do some science!

By the way, the impending doom threat here is real. I quickly need $2000.00 to cover back rent and utility bills. HRRO could soon be shut down without electricity, phone, heat, roof etc. It would be exceptionally difficult to continue operating the telescope under such inconveniences. My receiver does run on storage batteries, but not as a planned contingency for this kind of peril. Perhaps I shall soon join the ranks of big-league professional radio astronomy in Canada merely by ceasing operations. Have you heard of Algonquin?

Please pass on all my best wishes to the NAAPO group for me, and please keep that wonderful newsletter coming my way.

Yours sincerely,

Robert W. Stephens
President

encls.

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Extraterrestrials Exist!
by William H. Mook, Jr.

The foremost critic of SETI has been Dr. Tipler. Tipler has written many articles which purport to prove ETs cannot exist. If they did, Tipler argues, they would be detectable now. Tipler points out that technology is capable of sustained exponential growth in time periods short by astronomical standards, and so Tipler repeats Enrico Fermi's famous question, "Where are they?".

Some who ponder this question conclude, as Fermi did, that any technical civilization agressive [sic] enough to unleash atomic power, is too agressive [sic] to survive atomic power. Tipler says all ET's who survive the atom will end up dominating the galaxy. By putting these two arguments together you can prove ETs do not exist.

Life is not as simple as this. Carl Sagan pointed out that if there were some ET's who survived the nuclear threat and retained a technical capability these ET's would end up being 'nice guys' who would choose through intelligent action not to dominate the galaxy the way Tipler envisions. Tipler predictably classed this last argument as wishful thinking and pointed out that no life form we know of chooses not to compete for resources. Sagan responded that no other form of life we know of is intelligent. Presumably this included Tipler.

Between a universe devoid of technical life forms and a universe dominated by C1 - the first culture I feel there are other possiblities. Tipler sees no mechanisms which would limit ET's growth once a certain stage were reached. This is wishful thinking on his part. Tipler also fails to enumerate factors which would affect population density of the dominant ET culture. This last is important because population density will be a primary factor in the detectability of ETs. If population density remains high as ETs spread throughout the galaxy they will be easily detected. If however ET population density falls over time, ETs may be very difficult to detect.

There are three quite reasonable factors which come to mind which may affect ET population density if they exist. First, all stars may not interest ETs. Second, fecundity of ET's may fall as they progress technically. Finally, ET may value the diversity of emerging cultures more than the resources they consume.

All stars may not interest an advanced civilization. If humans should develop an interstellar capability we may find the first 100 or so star systems extremely interesting. One could imagine that we may settle them fully. This excitement may not exist after the first million stars are explored. It may turn out that after exploring and fully settling all worlds within a sphere 100 parsecs in radius or less from the Sun we would be more selective in our choice of target worlds. Applying this rule generally, after ETs settle a representative sample of the galaxy all future attention would be paid examining the truly interesting and unusual phenomena presented to the exploring culture. In this scenario very dense 'hot spots' would exist in the galaxy, but the average density of ETs could be quite low. On our own Earth this is the case. If you were to visit Kwoloon, Tokyo, Manhattan or Paris on a Saturday night you would correctly conclude that Homo Sapiens were the dominant species on the planet. If you were presented with the floor of the Pacific Ocean or a polar ice cap, you may come to a different conclusion.

ET reproductive capability may fall as technology rises. On Earth there appears to be a strong correlation between standard of living and slowing of the reproductive rate. Sociologists explain that this is due to the plethora of activities a technical culture allows. All of these activities compete with reproductive activities so where technical culture is most deeply entrenched we find the lowest birth rates. This effect appears to be universally applicable. If it is ETs may find that after a short period of time that few individuals are spread throughout a large volume of space. It may be that small bands of ETs may control the resources of several star systems and have little impact on any one of them. The industrial model for ET expansion which Tipler applies may be incorrect. A tribal model may be more appropriate. A scenario where many small tribes of ET's are dispersed throughout the interstellar wilderness may be more correct. If so such ETs may be very difficult to detect.

ETs may value diversity over resources. As technology develops there is a general trend, earning a living becomes easier. Eventually a few rocks and some hydrogen is all a technical culture may need to progress economically. If this occurs the resources used by an emerging culture may be of less value to an advanced technical culture than the existence of the emerging culture. After all there are a lot of rocks and hydrogen in the galaxy compared to the number of technical civilizations. In simple terms, emerging cultures may have entertainment value for the advanced cultures. As long as the cost in resources is less than this value advanced ET's would support emerging cultures they found interesting. This

altruistic behavior may become an inculcated pattern, especially if at some point direct benefits accrue to the advanced culture because of it. After all some pretty simple animals we know of emit altruistic behaviors toward other animals. It does not seem far fetched to believe advanced civilizations could adopt altruistic behaviors for the same motives as much simpler species.

If one imagines a scenario which combines all of these factors the galaxy could be filled with technically advanced civilizations and we may not be able to detect them. We can imagine that a technical culture with interstellar spaceflight capability expanding from their home planet. As they spread they are attracted to the most interesting spots in the galaxy. At the same time their reproductive rate falls. If they should come across another emerging life form it is not hard to imagine they could set aside the resources to protect its development.

So despair not! Our skies are not filled with spaceships. The airways are not filled with ET chatter. This proves nothing as to the existence of ET's or their detectability if we put forth a concerted effort. Any belief strongly held in the absence of evidence must qualify as a superstition. As scientists we must not be swayed by superstition but develop experiments to resolve interesting problems and possibilities. ET's may exist. We might be able to advance this question through the judicious use of current radio-telescope technology. On with the search!

CSWP GAZETTE FEATURES ASTRONOMER

The Oct/Nov 1986 issue of the Newsletter of the Committee on the Status of Women in Physics features a condensation of an article entitled "Women's Work" by Vera Rubin which appeared in Science 86 (July/August). I recommend this article in the original or the condensed version. Dr. Rubin, besides being a talented and productive astronomer, has a fine sense of the not-too-glorious treatment the astronomy establishment has bestowed upon the small percentage of its workforce who happen to be women. To paraphrase a recent television plea, "A brilliant mind is a terrible thing to waste."

For those of you who do not now receive the CSWP Gazette may do so by requesting your name to be added to the mailing list. Send your requests to:

Dr. Miriam Forman
American Physical Society

335 East 45th Street
New York, NY 10017

1420 MHz CALIBRATION SOURCE NEEDED

As mentioned in the last NAAPOnews we have need for a reliable calibration source to operate at 1420 MHz. There are a number of options on this, but we need someone to begin working in collaboration with the staff here at Big Ear to develop, build and test such a device. This could well be a year-long project for one of our outlying institutions. If your group would like to take this on as a project, get in touch with NAAPO Coordinator (PEB) at (614) 898 1516 and we can begin by giving you a status report (hardware already available) and specifications for the end product.

FLAT REFLECTOR MOVED TO -28 Deg 20 Min

System check-out will begin while observing the sky in the vicinity of the galactic core. There are a number of reasons for setting at this declination. Besides the presence of Sagittarius A (or Jansky 1 in the Kraus notation) it is a declination zone that has presented a number of narrow bend anomalies. It will give us an opportunity to monitor the region for the SARA 'intermittent' source. It is most likely that the flat reflector will remain in this position for the next several months.

DO YOU HAVE YOUR *

We find life is full of risks. If you do not have a row of the little dudes across the top of your mailing label you risk the loss of future issues of NAAPOnews. You may earn a row of * * * * *s by simply doing one of the following:

1. volunteer a big block of time, material (useful to the cause), growth stock, etc., etc.

2. becoming a member institution of NAAPO (or a faculty liaison or student intern)

3. send us a check for > $9.99 made out to:
Otterbein College -- NAAPO

Then just sit back and watch those asterisks grow across your mailing label.

BOLINGER'S LAW

In specifications, Murphy's Law supecedes Ohm's.

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E-mail Webmaster

Designed by Jerry Ehman
Last modified: December 22, 2003