



NAAPO (North American AstroPhysical Observatory)

**"Signals"
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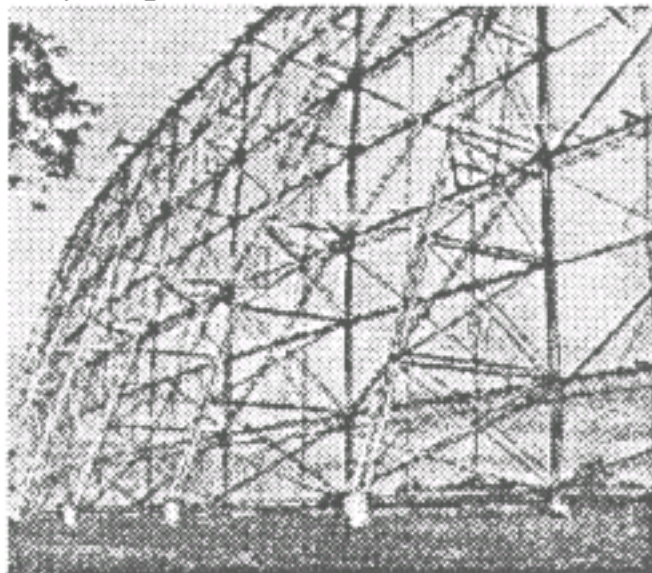
**NAAPO Coordinator: Dr. Philip E. Barnhart, Dept. of Physics/
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1516]**

Coordinator's Corner

Phil Barnhart

At the last Working Session the question of volunteer attrition arose. This has been a common occurrence in every volunteer organization I've ever encountered. Part of the explanation lies in the expectations brought to the engagement by the volunteer. The expectation that there will be a tailor-made task just waiting for the volunteer to step into and be led through step by step is quickly dispelled.

Another part of the explanation lies with the necessarily loose organization necessitated by the nature of the volunteer organization. Group leaders or individuals working on tasks often do not have time to indoctrinate and then bring up to date new volunteers "looking for something to do". This we can address. On the one hand, busy as we are, we need to take time to discuss (= educate) with new volunteers just what the problems are and how someone might aid in the



solutions. On the other hand, our greatest resource has always been the volunteer who can look at the situation and say, "I bet I can fix that if they give me the chance." We have seen this happen in a great way this spring with Steve Ellingson in RFI and John Ayotte in Editorial Management. Earlier in the year Lloyd Bamhart took on the challenge in getting the discone built. Let us not mourn the volunteer who does not insert him (her) self immediately into what must seem to some as a rather weird set of behaviors with many sailors and no captains. Let us rather cheer on the ones that stick to us and get monumental jobs done in spite of our organizational ineptitude. Without the Tom Van Homes we would not now be scratching our heads over one particularly intriguing 'mystery object'. If we had been "organized" he would have been writing copy for Signals!

I have just spent a week recovering from a massive attack of alien being in my digestive tract. It's one of those things the doctor says, "treat it and it will go away in a week; leave it alone and it will go away in 7 days." I elected to leave it alone and am now up and going again -- after seven days.

My sabbatical has begun. I am now starting full time on the NAAPO circuit. There is much to do. If you would like to unload some problem off onto me, I am fair game for the next three months.

Hunt for Life Beyond Earth Grows

Baltimore (AP) (Aug 9 1988)

The discovery of new planets and of complex organic chemicals in comets is encouraging astronomers to intensify their search of the universe for intelligent life beyond Earth.

"The circumstantial evidence is mounting every day" that intelligent life could have developed elsewhere in the universe, Michael J. Klein, manager of NASA's radio search for life, said yesterday.

Klein said discoveries announced last week that planetlike objects are orbiting distant stars, and that organic chemicals thought to be the precursors of life exist in comets support fundamental theories about life evolving from cosmic chemistry.

"That is the circumstantial evidence that life exists elsewhere," Klein said. "We know now that the materials are there."

He made his comments at the 20th assembly of the International Astronomical Union, which is meeting in Baltimore.

Klein heads a project called the Search for Extraterrestrial Intelligence which is planning an intensified search for radio signals from civilizations that may exist on planets orbiting distant stars.

Programs run by the National Aeronautics and Space Administration, Harvard University and others have listened for intelligence-directed radio signals for more than 20 years.

But only a small fraction of the vast universe and the many radio frequencies that must be monitored have been checked.

The Jet Propulsion Laboratory, which is operated by the California Institute of

Technology for NASA, has proposed to expand the effort with new equipment that would listen to tens of millions of channels at the same time.

The equipment would be monitored by a computer capable of identifying signals that could be sent by intelligent life.

Klein said the new equipment would be able to look at 1,000 different stars that are thought to be similar to the sun, locations that experts believe hold the best chance for the evolution of life.

Also, there would be "whole sky survey" in many radio frequencies in which every portion of the heavens would be systematically searched.

The new equipment would be 10 million times more thorough than present equipment, he said.

"In the first few minutes we would be able to match all of the searches that were done before," Klein said.

But even with the new devices the job is immense, said Frank Drake, chairman of a Search for Extraterrestrial Intelligence committee of the astronomical union and an astronomer at the University of California, Santa Cruz.

"Many people think the project should succeed in the next year or two," he said. "That's probably not going to happen. The universe is so huge and the cosmic haystack so large, it will take us decades."

The theory behind the project's work is that because there are billions of galaxies, each with billions of stars, the odds are good that the conditions that permitted life to evolve on Earth must exist elsewhere.

Klein said the federal budget now under consideration by Congress includes a \$6 million appropriation for the enhanced equipment. He said the project would last 10 years and cost \$90 million.

If the financing is approved, the intensified search could begin in 1992, with all the new equipment on line by 1994.

Have You Thought of Gift Subscriptions to Signals?

Phil Barnhart

Over the past few months we have received a number of requests for people to be placed on the mailing list. We have tried to accommodate all such requests. It continues to be a relatively expensive means of communication and as we are aiming at a regular 2/month mailing we have to be careful not to expand the list of recipients beyond a number that might provide a useful return.

There are several categories of "subscribers" to Signals. If you are reading this you are presumably in one of the following categories, or at least on friendly terms with someone who is.

1. Active Volunteer - your subscription is in partial payment for work dedicated to the radio observatory function.
2. Donor - your subscription is provided because you have donated money (or someone donated in your name) or property of value to the radio observatory directly or through NAAPO.
3. Trustee - you are one of the dedicated who originally stood in support of the efforts to save the radio observatory from destruction when the wheels of 'progress' tried to grind the antenna into golf fairways.
4. Consortium member - Personnel at 8 colleges and universities receive SIGNALS as a part of their stated willingness to participate in the undergraduate research opportunities provided by the radio observatory.
5. Complimentary - You are on the list because someone, possibly yourself, asked to be included. There is a time limit on COMP subscriptions which may be longer or shorter depending upon whether we get indication of interest or promise of donation.

In coming issues you will find a way to determine which of the categories your subscription has been (arbitrarily) assigned. As a regular house-keeping chore subscriptions to inactive or unresponsive readers will be dropped from the active

mailing list. Reinstatement can be achieved by fulfilling one of the criteria mentioned above.

If you think someone would like to be made aware of our endeavors, consider the possibility of a GIFT SUBSCRIPTION in their name. A donation of at least \$25 will bring it about. The money so donated goes directly into the radio observatory account for use in the projects of the observatory and are not used for the production of the news letter. This cost is borne by volunteers.

Be a friend -- give a gift and provide a subscription.

Fall: Quarter Working Session Schedule

1 October

15 October

5 November

19 November

3 December

17 December

6 - 8 October Planetary Society Conference on SETI - Toronto, Canada

Galaxy Discovered Near Edge of the Universe

Baltimore (AP) (Aug 9, 1988)

Astronomers yesterday announced the discovery of the most distant galaxy known, a cluster of stars 15 billion light-years away that formed long before the Earth and the sun.

"This is very unusual and very rare," said Ken Chambers of Johns Hopkins University, one of the co-discoverers. "We're seeing something from before the Earth formed, possibly before our own galaxy, and when the universe was very different than today."

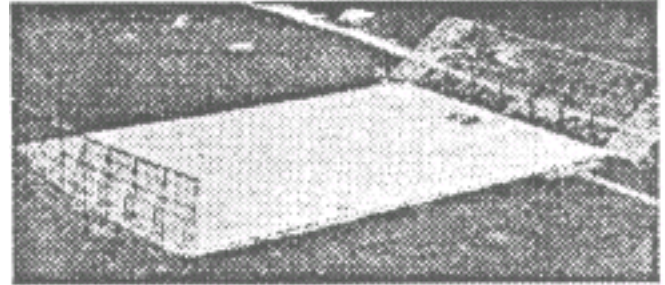
The distant galaxy, which they refer to as 4C41.17, is too faint to be seen by the eye. But it emits a radio signal a billion times more powerful than the sun's radio signal.

Chambers said at 15 billion light years the galaxy is about 90 percent of the distance to what is thought to be the edge of the universe. A light-year is the distance light travels in a year, about 5.8 trillion miles.

Micro-Group Arising Anew

After a few months of relative inactivity the Micro-Group operating out of Otterbein is getting back in business. CRAWFORD-S and BARNHART-P are discussing the holdings and needs left over from the last go'-round when we came very close to getting the mission to fly.

There will be regular meetings starting toward the end of September for those interested in the projects being pursued by this group.



Our primary aims are to develop the capability to monitor, control, display and process data from the focus room -- both on site, remotely and off line -- without placing undue burden on the 11/23. Many of the individual tasks are started and some are near completion.

Those wishing to volunteer for this group contact either BARNHART-P or the Group Leader CRAWFORD-S (614) 764 5149 [home] or (614) 488 6615 [home]. The first regular meeting will be announced next issue of *Signals*.

Policies Regarding Donations of Equipment/Components to NAAPO and the Radio Observatory

The Radio Observatory and NAAPO welcomes contributions of materials and instruments usable in our quest for knowledge and understanding of the wider universe. We will be specifying types and specific instruments needed in future issues of SIGNALS that may be available from interested friends of NAAPO and the Radio Observatory.

We can also serve -- to a limited extent -- as a clearing house for excess or obsolete components and parts. The main consideration here is transportation and space once we have the material. Some individuals or groups are interested in donating materials through Ohio State University. For such donations, contact either Bob Dixon, 805 Dreese Labs, 2015 Neil Ave., Columbus, Ohio 43210 or Steve Janis at

the same address. (614) 292 6789.

If it does not matter the route to the radio observatory, donations may be arranged through Phil Barnhart, Department of Physics/Astronomy, Otterbein College, Westerville, Ohio 43081. (614) 898 1516. We will be happy to acknowledge in writing such donations for possible tax purposes.

Donation Want List

Usable Components -- R, C, IC's, etc.

Computer Hardware and Peripherals -- Working, with documentation

Desirable Software -- Documented

Supplies -- Paper, Stamps, pens, surplus anything -- file stuff

Instruments -- Check with us before sending

Wish List Contest

In trying to generate a coherent list of needs and requests, BARNHART-P has encountered some difficulty and hang-ups with an unwillingness to send or communicate needs that are relevant to your particular operations.

To stimulate your creative juices a CONTEST will be held. This will operate along the lines of the \$10 Million Dollar Jackpot routines. You may already have won ... etc.

The few simple rules . . .

1. Send us your list of needed services or instruments along with a priority rating for the list.
2. The list arriving earliest with the most useful or productive suggestions will win for the sender a fabulous prize.

Judges will huddle behind closed doors and reach a decision before 10 October. Duplicate prizes may be awarded all entries. The decisions of the judges may be muddled.

Mail your entries to - -

Barnhart -- NAAPO/Otterbein
Dept. of Physics and Astronomy

Otterbein College
Westerville, Ohio 43081

Gigantic Space Observatory Proposed by Soviet Scientists

Baltimore (AP) (August 10, 1988)

Soviet astronomers are proposing 100-ton "superobservatory" in space, more massive than anything planned in the West, to be launched in this century.

Nikolai S. Kardashev, a member of the Soviet Academy of Sciences, said yesterday that preliminary engineering studies of the observatory envision three powerful instruments to gain unprecedented views of the heavens.

In an interview at the 20th assembly of the International Astronomical Union, Kardashev said plans call for parts of the observatory to be sent into Earth orbit aboard the Soviets' powerful Energia rocket.

The observatory would be assembled in space "either by robots or by astronauts and cosmonauts," he said.

A second rocket would then send the observatory to the so-called Lagrangian point L-2 about 900,000 miles from Earth, where the gravitational attractions of the Earth, moon and sun balance one another. An object left in L-2 would remain there.

"This would give very high resolution of the whole universe," Kardashev said. He said the sun, Earth and moon would be visible at all times from L-2 in one direction, while the rest of the universe could be seen by pointing instruments away from the sun.

An observatory at L-2 would orbit the sun in about a year.

Kardashev said instruments proposed for the observatory are an X-ray and gamma-ray detector, a 400-meter radio telescope and a 10-meter optical telescope.

The optical telescope would be about four times more powerful than the \$1 billion space telescope planned for launch next year by the National Aeronautics and Space Administration.

Kardashev said observation data collected by the instruments would be sent by radio to ground stations or satellites, and the observatory would be able to operate around the clock.

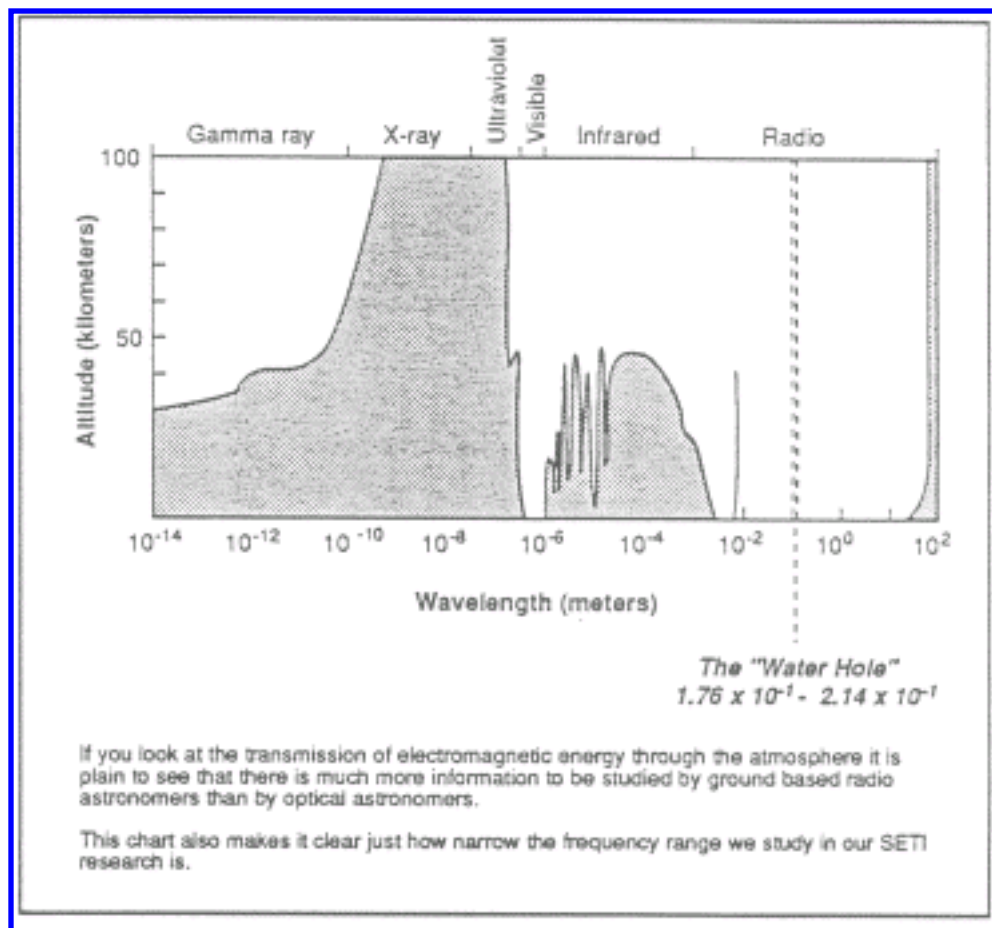
"This would be a very big project and we are very interested in international cooperation," he said.

Kardashev said the cost would be "1 billion rubles or dollars," but American astronomers say a project of such scope would cost far more.

The Soviet scientist said it is believed that if the project is started soon, it would be ready for launch by the year 2000.

In a statement, the Soviets said the super observatory "can only be realized in the context of broad, international collaboration."

Transmission of Electromagnetic Energy Through the Atmosphere



[Click image for a larger-size version.](#)

The wavelength range (in meters) for the "Water Hole" is:
 1.76×10^{-1} to 2.14×10^{-1}

The caption underneath the chart is:

If you look at the transmission of electromagnetic energy through the atmosphere it is plain to see that there is much more information to be studied by ground based radio astronomers than by optical astronomers.

This chart also makes it clear just how narrow the frequency range we study in our SETI research is.

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Designed by Jerry Ehman

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