



SearchLites

Vol. 29 No. 3, Summer 2023
The Quarterly Newsletter of The SETI League, Inc.

Offices:

433 Liberty Street
Little Ferry NJ
07643 USA

Phone:

(201) 641-1770

Facsimile:

(201) 641-1771

Email:

info@setileague.org

Web:

www.setileague.org

President

Richard Factor

Registered Agent:

Anthony Agnello

Secretary/Treasurer:

A. Heather Wood

Executive Director Emeritus:

H. Paul Shuch, Ph.D.

Trustee:

Martin Schreiber, CPA

Advisory Board:

Anthony Agnello
Paul Davies, Ph.D.
Robert S. Dixon, Ph.D.
Claudio Maccone, Ph.D.
Clifford Stoll, Ph.D.

SearchLites, ISSN 1096-5599, is the Quarterly Newsletter of **The SETI League, Inc.**, a membership-supported, non-profit [501(c)(3)], educational and scientific corporation, dedicated to the electromagnetic Search for Extra-Terrestrial Intelligence. SETI League, Dr. SETI, and the above logo are all registered service marks of The SETI League, Inc. Entire contents copyright © 2023 by The SETI League, Inc. Permission is hereby granted for reproduction in whole or in part, provided credit is given. **All opinions expressed are those of the individual contributors.**

Radio Transmissions Seek to Measure Asteroid **by Beth Johnson (Reprinted from the SETI Institute Website)**

An experiment conducted in Alaska used long-wavelength radio transmissions to hopefully map the mass distribution of a potentially hazardous asteroid.

Using a powerful transmitter, the experiment sent long wavelength radio waves into space for twelve hours, targeting a small asteroid cataloged as 2010 XC15. Discovered by the Catalina Sky Survey back in 2010, this asteroid is about 150 meters across and is considered a potentially hazardous object as its orbit is mostly within the orbit of Earth. On December 27, 2022, 2010 XC15 passed by our planet at about two lunar distances, allowing the HAARP team to use radio waves to observe the small body during that close approach.

While most programs use optical and radar telescopes to collect data about the orbits and shapes of asteroids, as well as somewhat image their surfaces, these observations use short wavelengths that simply bounce off the surface, providing little to no information about the interiors. The long wavelengths transmitted by HAARP, on the other hand, are capable of penetrating the surface and providing information about the characteristics such as density, similar to how ground-penetrating radar works here on Earth to detect anomalies underground.

HAARP sent the signals up to 2010 XC15, and two radio arrays received the return signals: the University of New Mexico's Long Wavelength Array and the Owens Valley Radio Observatory Long Wavelength Array near Bishop, California. However, the results are pending, as lead investigator Mark Haynes notes: We will be analyzing the data over the next few weeks and hope to publish the results in the coming months. Finding new ways to determine the structure of potentially hazardous asteroids like 2010 XC15 and the more infamous Apophis will help scientists understand just how hazardous the asteroids may actually be. If we can determine the distribution of mass inside the asteroid, we can plan out missions that can target the asteroid to change its orbit, as NASA did with the Double Asteroid Redirection Test mission, or DART, last year. The question then becomes what sort of impactor we need to shift the orbit because if the asteroid is a rubble pile like Bennu or Ryugu, an impact could break the asteroid apart. That would potentially result in more impacts, but they would be smaller and likely burn up in the atmosphere.

Automobile-sized asteroids will also generally burn up in the atmosphere, despite creating fireballs in the sky, and they happen about once per year. Meteoroids around 100 meters in diameter hit our atmosphere every 2,000 years or so, and they can cause significant damage. Dinosaur-killing asteroids — on the order of 100 kilometers in diameter — only strike every few million years. While extremely rare, the goal is to prevent such a catastrophic strike. Experiments like the HAARP transmission and the DART mission are the latest steps in the important field of planetary defense.

As an interesting side effect of last week's experimental transmissions, amateur astronomers and ham radio operators reported to the HAARP program that they also received the transmissions. The chirps were broadcast at "slightly above and below 9.6 megahertz" every two seconds, and, as HAARP program manager Jessica Matthews notes: So far we have received over 300 reception reports from the amateur radio and radio astronomy communities from six continents who confirmed the HAARP transmission.

Per SETI Institute research scientist Michael Busch, who was not involved in the experiment, the signals could be picked up partly "because of the ionosphere scattering most of the beam going out and coming back." These reports will also help the HAARP team understand the ionospheric conditions at the time of the transmissions. Two experiments for the price of one!

I'm looking forward to the results of this program. After all, I'd really rather not go out like the dinosaurs.

Guest Editorial:

Where Is Everybody?

by Dan Duda

from the March 2023 issue of Penn Central,
the monthly newsletter of Central PA Mensa,
used by permission

“Humans could theoretically colonize the galaxy in a million years or so, and if they could, astronauts from older civilizations could do the same. So why haven't they come to earth?” Enrico Fermi

The Fermi Paradox is a clear statement regarding the cosmological and broader scientific enigma about our total lack of contact with any extraterrestrial lifeform, let alone sentient life, in this incredibly vast universe. Fermi's pithy comment says it all: *“where is everybody?”*

The scientific community is rife with possible answers, but none rise to the level of a theory. The Drake equation, proposed by cosmologist Frank Drake, provides a mathematical formula for calculating the number of sentient species we should expect to exist in the universe.

You may remember the entertaining presentations of the Drake Formula by SETI League Executive Director H. Paul Shuch. Armed with his guitar and slides, he sings about all the factors in a way that has us looking at the night sky as we leave for home. It would require more space than we have here to detail all the elements like Paul does, but if you're interested, check out this reference:
www.seti.org/drake-equation-index

Now for a few of the possible answers to Fermi's question. We haven't been contacted by extraterrestrials because:

1. The distance between stars is too great to overcome.
2. Few life forms have advanced far enough to communicate.
3. Most life forms have advanced beyond us and find us uninteresting.
4. Advanced civilizations have surpassed us in communications technology (i.e., radio) and find us easy to overlook.

5. Civilizations tend to advance to a point where they destroy themselves with technology.

A new idea (at least to me) has recently been proposed. That's Levinthal's paradox addressing the problem of protein folding. It states that *“it would not be possible in a physically meaningful time to a protein to reach the native (functional) conformation by a random search of the enormously large number of possible structures.”*

Remember, protein folding is necessary for the evolution of life. But because of the degrees of freedom involved, based on statistics it would require longer than the age of the universe for the first protein to get started. How's that for an answer to Fermi? We beat the statistical odds here on Earth. To expect it to happen elsewhere is dreaming — that is, if Levinthal's thinking is completely accurate.

I'd like to segue a little here and focus on Number 4 (above). Recently an asteroid (Oumuamua) thought to have come from outside our solar system was scrutinized for possible signs of extraterrestrial life. In a program on the Science Network a scientist said that we've closed the book on that possibility because we made a thorough scan with radio telescopes and found no radio signals. To me that presents a serious problem with our science. In a civilization a million or more years advanced compared to us, wouldn't it be likely that they would have communications technology far beyond our radio? Fermi summed up his concern with 3 words: *“Where are they?”* And I think most real scientists apply another 3 words to most of the mysteries we deal with: *“We Don't Know.”* That should have been the final assessment of Oumuamua.

In the words of Max Planck *“Science cannot solve the ultimate mystery of nature. And that is because, in the last analysis, we ourselves are part of the mystery that we are trying to solve.”*

Disclaimer: The opinions expressed in editorials are those of the individual authors, and do not necessarily reflect the position of The SETI League, Inc., its Trustees, officers, Advisory Board, members, donors, or commercial sponsors. ❖



SETI League members are encouraged to nominate SETI-relevant websites for our monthly SETI SuperStar Award. Nominating emails to our Awards Committee may be sent to:
Awards_at_setileague_dot_org.

Please be sure to indicate the URL of the candidate website you are nominating, and a brief explanation as to why you consider the site worthy of recognition.

Event Horizon

SearchLites readers are apprised of the following conferences and meetings at which SETI-related information will be presented. League members are invited to check our World Wide Web site (www.setileague.org) under *Event Horizon*, or email to us at info@setileague.org, to obtain further details. Members are also encouraged to send in information about upcoming events of which we may be unaware.

June 19 - 22, 2023: *Second Annual Penn State SETI Symposium*, State College PA.

August 23 - 29, 2023: *81st World Science Fiction Convention*, Chengdu, China.

September 25 - 29, 2023: *74th International Astronautical Congress*, Baku, Azerbaijan.

August 8 - 12, 2024: *81st World Science Fiction Convention*, Glasgow, Scotland.

October 11 - 18, 2024: *75th International Astronautical Congress*, Milan, Italy.

September 29 - October 3, 2025: *76th International Astronautical Congress*, Sydney, Australia.



2022 Financial Report

990 Line	REVENUES:	2022 (budget)	2022 (filed)
1d	Dues, Grants & Contributions	10,000	11,655
4	Interest & Investments	0	300
12	Total Revenues:	10,000	11,955
	EXPENSES:	2022 (budget)	2022 (filed)
13	Educ. and Scientific Programs	8,000	8,640
14	Management & General	750	1,161
15	Fundraising	1,750	200
17	Total Expenses:	10,500	10,001
18	Excess or (Deficit) for the year	(500)	1,954
	BALANCE SHEET:	2022 (budget)	2022 (filed)
19	Beginning Net Assets	15,982	15,982
21	Ending Net Assets	15,482	17,936

2023 Budget

990 Line	REVENUES:	2023 (budget)	2023 (filed)
1d	Dues, Grants & Contributions	10,000	(pending)
4	Interest & Investments	0	(pending)
12	Total Revenues:	10,000	(pending)
	EXPENSES:	2023 (budget)	2023 (filed)
13	Educ. and Scientific Programs	8,500	(pending)
14	Management & General	1,000	(pending)
15	Fundraising	500	(pending)
17	Total Expenses:	10,000	(pending)
18	Excess or (Deficit) for the year	0	(pending)
	BALANCE SHEET:	2023 (budget)	2023 (filed)
19	Beginning Net Assets	17,936	(pending)
21	Ending Net Assets	17,936	(pending)

Minutes of the 2023 SETI Virtual Membership Meeting **Conducted online on 16 April 2023**

- **Call to Order**

The 2023 Membership Meeting was called to order by Executive Director Emeritus H. Paul Shuch, virtually (via the Zoom platform) at 13:00 hours EDT.

- **Quorum Call**

Trustees and Officers present: A. Heather Wood, Richard Factor, H. Paul Shuch

Trustees and Officers absent: Martin Schreiber

Additional Members present: Jon Richards, Elisabeth Pioletat, Scott Carter, Allen Katz, Fred Erskine, Matthew Bajor

Guests present: Ken Miller

A quorum is present.

- **Minutes of 2022 Annual Membership Meeting**

The Minutes of the 2022 Annual Meeting Meeting having been previously posted to The SETI League's World Wide Web site, a motion was passed to accept the minutes as submitted.

- **Treasurer's Report**

Developed jointly by Dr. Shuch and Secretary/Treasurer Heather Wood, covering the calendar year 2022 (as e-filed).

1. Revenues: Dues and Contributions, \$11,655; Interest Income \$300; Total \$11,955.
2. Expenses: Educational/Scientific Programs \$8,070; Management/General \$635; Fundraising \$1,296; Total \$10,001.
3. Revenues minus Expenses: \$1,954.
4. End of 2022, SETI League account balances equalled \$17,936. 2021 beginning net assets \$15,982.
5. 2023 Budget: Projected Revenues \$10,000; Program Expenses \$8,500; Management/General Expenses \$1,000; Fundraising Expenses 500; Total Expenses \$10,000; Projected surplus (deficit) (\$0; Projected Ending Balance \$17,936.
6. This report was accepted by those attending virtually

- **Executive Director's Report**

During 2022, the Executive Director:

1. published four issues of *SearchLites*, the quarterly newsletter of The SETI League, Inc.
2. Attended the First Annual Penn State SETI Symposium, and (in his musical Dr. SETI persona) provided banquet entertainment.
3. performed 52 weekly updates of The SETI League website
4. posted 60 images, plus numerous links and comments, to The SETI League Facebook page
5. issued one press release
6. continued to serve as an Emeritus member of the International Academy of Astronautics SETI Committee
7. responded to a number of email and telephone inquiries from members and prospective members.

- **Committee Reports**

1. **Membership**

Ms. Wood reports that two new members joined The SETI League since our last Annual Membership Meeting, and we have 73 Members in Good Standing at the time of this meeting.

2. **OSETI Committee**

Mr. Factor is coordinating with SETI Institute personnel toward his goal of installing a laser detector on the roof of his Arizona home. However, this project has been delayed due to construction work currently underway on that residence.

3. **Awards Committee**

Absent an Awards Committee Chair, no websites received the SETI SuperStar award during the year 2022. There were no Giordano Bruno Awards or Orville N. Greene Awards presented for contributions during 2022. Nominations from members for all awards are solicited.

- **Old Business**

1. **Annual Report**

Periodic financial updates have been posted to the Website, and published in *SearchLites*.

2. **Web Server**

Mr. Factor reports that the current server is functioning flawlessly, it is now ten years

old, and cannot be expected to last forever. Thus, he has purchased a new server, to be installed when necessary.

3. Interstellar Beacon

Although the project was terminated in 2020, its website is still operational, and it continues to direct occasional queries and comments to project director Bill Kitchen. He gave a wrap-up report, and continues to see merit to the concept of transmitting Earth's archives into space.

4. Press List

Ms. Wood reports that no progress has been made on establishing an online press server, but she will continue to explore alternatives.

5. Telecommunications

SETI League headquarters remains unstaffed, with volunteers all working from home. Ms. Wood continues to receive calls occasionally via cellphone. She reports that the organization's primary means of contact are now email and the Facebook page.

• **New Business**

1. Election of Officers

The following slate of officers was retained for an additional one-year term:

- President - Richard Factor, serving without compensation
- Secretary/Treasurer - A. Heather Wood
- Executive Director Emeritus - H. Paul Shuch, serving on a volunteer basis
- Registered Agent - Anthony Agnello

2. Annual Budget

The draft 2023 Budget was presented to the Board for consideration.

3. Tax Return Filing

The Secretary/Treasurer reports that she was successful in eFiling our 2022 organizational tax return using the electronic Form 990N postcard, and having it timely accepted by the IRS.

4. Mid-Year Renewal Letter

Due to the pandemic-motivated one year extension of all memberships last year, no annual renewal letter was sent. One will be sent out during 2023.

5. New Jersey Charities Registration

Ms. Wood has submitted our annual New Jersey Charities registration forms and fees, which have been accepted.

6. Outreach

Special Projects Coordinator Scott Carter has proposed the SETI League develop a

short documentary video for online dissemination, summarizing our mission and accomplishments. Ms. Wood has offered to seek advice from an intellectual property attorney with whom she is in contact, regarding acquiring rights to previously produced SETI League documentary content.

7. Next Meeting

Pending confirmation by Mr. Factor of the dates of other technical meetings, the next Annual Meeting is tentatively scheduled for Sunday 14 April 2024. The date has been verified as not in conflict with Easter or Passover. The meeting will once again be held virtually via Zoom. at 1300 hours EDT, to be followed immediately by the Board of Trustees meeting. The date and time will be announced to the membership via the website and newsletter.

- **Advisory Board**

The Executive Director Emeritus reported the recent passing of advisor Greg Bear. He thanks the remaining members of our Advisory Board for their many years of service.

- **Good and Welfare**

The SETI League's Facebook page www.facebook.com/setileague has (as of this morning) attracted 1,566 "likes" and 1599 "follows" (each up 71 from last year), numerous member posts, and considerable discussion among members and nonmembers alike.

- **Adjournment**

The 2023 SETI League Annual Meeting was adjourned by the Executive Director Emeritus at 13:32 hours EDT on 16 April 2023. The required annual Board of Trustees Meeting followed immediately.

- **Board of Trustees actions**

- The Board of Trustees Meeting was called to order by the Executive Director Emeritus.
- The Board members present accepted all reports presented at the Annual Membership Meeting, and adopted the proposed 2022 Budget.
- **Personnel matters**
The Executive Director Emeritus reviewed with the Board of Trustees the previously adopted terms for cost-sharing of his health insurance premiums, as a program expense, which will continue at last year's percentage, pending availability of funds and subject to periodic review.
- The Meeting was adjourned at 13:36 hours EDT.
- Members and guests in attendance were invited to remain online to continue informal discussions on the Zoom platform, which continued until 14:00 hours EDT.

Respectfully submitted by Prof. H. Paul Shuch, Executive Director Emeritus



Non-Profit Org.
U.S. Postage
PAID
Williamsport, PA
Permit No. 38

To:

Has your address changed?
Please correct your label and return it to us.

SearchLites Volume 29 No. 3, Summer 2023

Printed in the USA

ADDRESS SERVICE REQUESTED

Annual Renewal: Is This Your Last *SearchLites*?

SETI League memberships are issued for the *Calendar Year*. Please check the expiration date indicated on your mailing label. If it reads December 2022 or earlier, you have already expired, and *must* renew your SETI League membership **now!** Please fill out and return this page along with your payment.

Please renew my membership in this category:

Full Member	\$50 / yr
Supporting Member (elderly, retired, or disabled)	\$35 / yr
Scholarship Member (full-time students only)	\$25 / yr
Household Member (same address as a Full Member)	\$15 / yr
Household Life Member (same address as a Life Member)	\$300
Life Member (until we make contact)	\$1,000
Sustaining Life Member – a generous <i>annual</i> pledge of:	\$1,000 / yr
Patron (priority use of The SETI League’s radio telescope)	\$10,000
Director (Patron membership plus seat on advisory board)	\$100,000
Benefactor (a major radio telescope named for you)	\$1,000,000

Annual memberships are issued for the calendar year. Those processed in January through April expire on 31 December of that year. Those processed in September through December expire on 31 December of the *following* year. Those members joining in May through August should remit half the annual dues indicated, and will expire on 31 December of the same year.

Order Your Membership Premiums:

	(u)*	(o)*
Pocket protectors	\$ 3	\$ 4
Mouse pads	\$ 5	\$ 7
<i>Tune In The Universe!</i> (CD-ROM)	\$25	\$30
<i>Proceedings of SETICon01</i>	\$20	\$27
<i>Proceedings of SETICon02</i>	\$20	\$27
<i>Proceedings of SETICon03 (CD)</i>	\$15	\$18
<i>Proceedings of EuroSETI04 (CD)</i>	\$15	\$18
<i>Proceedings of SETICon04(CD)</i>	\$15	\$18
<i>SARA Conference Proceedings:</i>		
2006, 2007, 2008, 2009 (specify)	\$20	\$27
<i>SETI League Technical Manual (CD)</i>	\$10	\$13
<i>Project Cyclops 2nd Edition</i>	\$20	\$30
<i>The Listeners</i> by James Gunn	\$15	\$21
<i>Sing More Songs of SETI</i> (Songbook)	\$10	\$13
<i>Sing a Song of SETI</i> (music CD)	\$15	\$18
<i>Sing More Songs of SETI</i> (music CD)	\$15	\$18
SETI Nerd Gift Set (one each Mouse Pad, Pocket Protector, <i>Project Cyclops</i> and <i>Tech Manual</i>) at 20% Savings to <u>Members Only</u> :	\$30	\$45

***Includes postage to (u) US addresses, or (o) other locations
Payments in US Dollars, check payable through a US bank**

Pleased to Accept PayPal

The SETI League invites you to pay your membership dues and additional contributions via credit card, using the PayPal online payment system. Simply log on to www.paypal.com and specify that your payment be directed to paypal@setileague.org.

Name: _____

Address: _____

Phone: _____ email: _____

Ham call: _____ URL: _____

Contribution enclosed (US Dollars): _____