



SearchLites

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The Quarterly Newsletter of The SETI League, Inc.

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In Memoriam:

Dr. Owen K. Garriott, W5LFL

22 November 1930 – 15 April 2019



KT6W photo

The SETI League is saddened to report the death in April of Owen Garriott, W5LFL, at age 88. Owen was an electrical engineering professor at Stanford, a Skylab and Space Shuttle astronaut, and a lifelong radio amateur. In December 1983, he became the first ham to operate in space. In this early 1984 picture, Owen is exchanging QSL cards with H. Paul Shuch (now SETI League Executive Director Emeritus), following Owen's historic STS-9 mission.

Garriott became a licensed radio amateur at the age of 15. It was ham radio that prompted him to become an electrical engineer, and ultimately one of NASA's first scientist-astronauts in 1965. He joined the space program after having served as an electronics officer in the US navy, and as a professor of electrical engineering at Stanford University.

In 1973, Garriott spent two months aboard the Skylab space station. He had wanted to operate ham radio equipment aboard Skylab, but was denied permission by NASA. A decade later, he received approval to operate the world's first ham radio station in low earth orbit. That mission captured the imagination of radio amateurs around the world, inspired those hams who founded The SETI League a dozen years later, and led to ham radio becoming a standard fixture of space missions to this day.

Guest Editorial

Searching for Alien Megastructures

by Seth Shostak, Senior Astronomer, SETI Institute

From SETI Institute *Journey* eNewsletter,
24 April 2019, used by permission

If you're trying to come up with the best game plan for proving the existence of extraterrestrials, you've got plenty of options. Naturally, you want a strategy with a high chance of success, simply in the interests of time, money and a shot at the Nobel Prize.

For nearly 70 years the scheme favored by most scientists has been to look for signals — radio transmissions. That's the classic approach of SETI (the search for extraterrestrial intelligence), and frankly, it makes sense. Radio can easily traverse light-years, and the technology for detecting it is well known and highly sensitive.

But is looking for signals really the best plan? Is it possible that we're making the wrong bet? There's an attractive alternative: searching for physical artifacts — alien structures. We're not talking about crop circles or other odd phenomena here on Earth. We're talking about massive engineering works that an advanced society has constructed somewhere in space.

Why search for artifacts? Because it eliminates the requirement that the aliens have chosen to get in touch — to transmit radio signals our way. Sure, maybe they'd want to do that, but then again maybe they'd rather lay low. If you're not sure you're the Milky Way's top-dog society, you don't want to bet the farm by assuming that the alpha aliens, wherever they might be, have good intentions. Silence could have survival value.

There's another point: Picking up an alien civilization's transmissions requires that the signal reach your telescope at the very moment that you're pointing it in their direction. This is SETI's well-known "synchronicity" problem, and it's been likened to firing a bullet and expecting that it will intercept, head-on, another bullet shot by someone else. Improbable.

In nearly every radio SETI experiment, the amount of time spent listening at any given frequency is but a few minutes. The universe has been around for nearly ten thousand trillion minutes, so SETI efforts are a bit like stepping into the backyard hoping you're just in time to catch a raccoon stealing the cat food.

Of course, you can believe the aliens have some good reason to spend lots of time transmitting to Earth, but if they're even a short distance away (astronomically speaking), they won't know we're here — there hasn't been enough time for our radar and television signals to reach them yet, even at the speed of light.

In contrast, artifacts may be lurking in space just waiting our discovery, all night, every night. China's Great Wall and the Egyptian pyramids are earthly constructions that have existed for centuries. Finding them doesn't demand much synchronicity.

Have we found any alien megastructures? In 2015, astronomer Tabetha Boyajian and her colleagues reported on a

star 1,400 light-years away that occasionally dimmed. Actually, it dimmed a lot, and this wasn't normal stellar behavior.

One explanation was that the star was surrounded by a Dyson sphere. The idea, proposed years ago by physicist Freeman Dyson, is that really advanced aliens would construct a gargantuan, spherical swarm of solar panels in orbit beyond their own planet — sort of the way you might cup your hands around a candle to collect the heat. The swarm would gather enough starlight to energize the aliens' souped-up lifestyles, and could sometimes get in the way of light from the star, causing it to intermittently dim as seen from afar.

That explanation for Tabby's star seems less likely today. Astronomical measurements show that it gets redder when it dims, suggesting that it's surrounded by naturally produced dust, not a gargantuan group of light collectors.

But it's reasonable to believe that Dyson spheres exist somewhere. In the past, astronomers looked for clues to such massive engineering projects by trawling star catalogs for systems that show an excess of infrared light — produced by the warm backside of the panels. Another approach is to comb through data from the European Space Agency's Gaia space telescope to find stars whose light is fainter than expected, simply because their shine is partially, and constantly, blocked by a bunch of panels.

Recently, University of Chicago physicist Daniel Hooper offered a new idea for searching for high-tech alien artifacts. He notes that the universe is expanding, and galaxies are growing ever farther apart. So forward-thinking alien societies might want to grab stars from nearby galaxies while they can and park them in their cosmic neighborhoods as a hedge against future energy scarcity. This is akin to storing gasoline if you're worried about a developing shortage. If collections of corralled stars do exist, they'd be easy to spot in the course of mainstream astronomy research.

Looking for extraterrestrial signals has a venerable history and no doubt a promising future. But a search for structures accumulated during the many billions of years of cosmic time might give someone a leg up on that Nobel.

Yes, efforts to find Dyson spheres have come up empty. And we haven't found any stellar stockpiles either. But tomorrow could be different.

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. ❖



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Minutes of the Twenty-Fifth Annual Membership Meeting

**14 April 2019, Eventide Inc., Little Ferry, NJ
(adjacent to SETI League Headquarters)**

- **Call to Order**

The meeting was convened at 13:00 hours EDT at Eventide Inc. (adjacent to SETI League Headquarters) in Little Ferry NJ, by Executive Director Emeritus Dr. H. Paul Shuch. Four SETI League members in good standing (plus one guest) are present. The SETI League currently has roughly 150 members in good standing. Our Bylaws requiring one percent of the current membership to be in attendance for the conduct of SETI League business, the attendees represent a quorum.

- **Minutes of 2018 Membership Meeting**

The Minutes of the 2018 Membership Meeting having been previously posted to The SETI League's World Wide Web site, a motion was passed to accept the minutes as posted.

- **Treasurer's Report**

Developed jointly by Dr. Shuch and Secretary/Treasurer Heather Wood, covering the calendar year 2018 (as e-filed).

1. Revenues: Dues and Contributions \$30,097; Interest Income \$11; Total \$30,108.
2. Expenses: Grant Disbursement \$8,112; Educational/Scientific Programs \$14,162; Management/General \$1,687; Fundraising \$440; Total \$24,401.
3. Revenues minus Expenses: \$5,707.
4. End of 2018, SETI League account balances equalled \$21,663. 2018 beginning net assets \$15,976.
5. 2019 Budget: Projected Revenues \$12,000; Grant Disbursements \$4,000. Program Expenses \$12,000; Management/General Expenses \$2,000; Fundraising Expenses \$1,000; Total Expenses \$19,000; Projected surplus (deficit) (\$4,000); Projected Ending Balance \$17,663.

6. This report was accepted by those present.

- **Executive Director's Report**

During 2018, the Executive Director:

1. published four issues of *SearchLites*, the quarterly newsletter of The SETI League, Inc.
2. gave SETI public lectures and/or concerts in Boston MA (2), Baltimore MD, Horsham PA, and Cherry Hill NJ.
3. performed 52 weekly updates of The SETI League website
4. posted roughly 100 photos, plus numerous links and comments, to The SETI League Facebook page
5. issued two press releases and conducted one press interview
6. was elected to a sponsored membership in the International Astronautical Union (IAU), inducted into the physics honor society Sigma Pi Sigma as an Emeritus Physics Professor, and allowed his membership in the International Academy of Astronautics to lapse due to the high cost of annual dues.
7. responded to several dozen email and telephone inquiries from members and prospective members.
8. advised two astrophysics students from Lycoming College in the design and construction of a radio telescope for a class project.

- **Committee Reports**

Membership

Ms. Wood reports that four new members joined The SETI League during 2018, and we have six new members so far this year.

EME Committee

No activity, during 2018, and no prospects for EME activity in the future.

OSETI Committee

Mr. Factor met with representatives of Hamaamatsu to learn more about their high-

speed optical data detectors. The SETI Institute has yet to provide Mr. Factor with details regarding their OSETI equipment, though he still has plans to install an Optical SETI observatory at his Sedona AZ location.

Awards Committee

For personal reasons, Awards Committee chairman David Ocame has tendered his resignation. Thus there were no Giordano Bruno Awards or Orville N. Greene Awards presented for contributions during 2018. Only eight websites have been given the SETI SuperStar award during the year. Nominations from members for all awards were solicited in a recent issue of *SearchLites*.

• **Old Business**

1. **Very Small Array**

Dr. Shuch reports that the project remains on hold, due to lack of funding, with no progress to report since last year. However, two groups of astrophysics students from Lycoming College in Williamsport PA toured the facility during 2018.

2. **Mid-Year Renewal Letter**

Last November, Ms. Wood emailed annual renewal letter to current and lapsed members, resulting in a roughly 70% renewal rate. These mailings will continue for future years.

3. **Annual Report**

Although the formal Annual Report has been discontinued, annual financial updates continue to be posted to the Website, and published in *SearchLites*.

4. **Web Server**

Mr. Factor reports that the website continues to function well. We continue to use a commercial email service for official SETI League communications.

5. **Interstellar Beacon**

Last year, The SETI League issued a small research grant to the Electrical Engineering department at Florida Institute of Technology, to help develop and test the required hardware and software. Prof. Shuch reports that he and Mr. Kitchen have received Phase 1 and Phase 2 reports of the university's re-

search findings, and the results are disappointing. They cast doubt on the viability of achieving meaningful interstellar range at sufficiently high data rates, using available telescopes and laser transmitters. Link analysis suggests that interstellar dispersion and other cosmic losses will limit either the range, or the information content (or perhaps both) for the proposed project. They are re-evaluating, and may perhaps need to redefine the mission goals.

• **New Business**

○ **Next Meeting**

The next Annual Meeting will be held on Sunday 26 April 2020. The date has been verified as not in conflict with Easter or Passover. The meeting will be at Eventide, Inc. 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.

• **Good and Welfare**

- The SETI League's Facebook page www.facebook.com/setileague has (as of this morning) attracted 1,354 "likes", 1364 "follows," numerous member posts, and considerable discussion among members.

• **Adjournment**

The Annual Membership Meeting was adjourned by the Executive Director Emeritus at 13:41 hours EDT on 14 April 2019. A Regular Board of Trustees meeting followed a brief recess, convening at 13:54 EDT.

Business Transacted by Board of Trustees:

0. **Quorum Call**

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

Trustees and Officers absent: Martin Schreiber

A quorum is present.

1. **Election of Officers**

The following slate of officers was re-

tained 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. 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.

3. Annual Budget

The draft 2019 Budget is adopted by the Board.

4. Advisory Board

The Executive Director Emeritus thanks members of our Advisory Board for their two and one-half decades of service.

5. Tax Return Filing

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

6. Press List

Ms. Wood has been unsuccessful in migrating our email Press List to Mail Chimp. She reports continued difficulties in uploading the appropriate spreadsheet. Dr. Shuch suggested trying to upload the press list in .XLS format, instead of .XLSX. Ms. Wood will try this.

7. Telecommunications

- Ms. Wood continues to retrieve voicemail messages monthly via cellphone. Prof. Shuch requests she try to do so once per week. She reports that the vast majority are spam calls.

8. New Business

- Dr. Shuch reports that the volunteer Project Argus Coordinator has recently tendered his resignation.
- The Board voted to disband the EME committee, due to no anticipated future activity in this area.

9. Scheduling of Next Meeting

The SETI League Board of Trustees will next meet on Sunday, 26 April 2020, immediately following the 26th Annual Membership Meeting, in Little Ferry NJ.

10. Adjournment

The Board of Trustees meeting was adjourned at 14:02 EDT.

2019 SETI League Budget

The following table represents the proposed operating budget of The SETI League, Inc., for the year indicated.

990 Line	REVENUES:	2019 (budget)	2019 (filed)
1d	Dues, Grants & Contributions	15,000	pending
4	Interest & Investments	0	pending
12	Total Revenues:	15,000	pending
	EXPENSES:	2019 (budget)	2019 (filed)
10	Grants	4,000	pending
13	Educ. and Scientific Programs	12,000	pending
14	Management & General	2,000	pending
15	Fundraising	1,000	pending
17	Total Expenses:	19,000	pending
18	Excess or (Deficit) for the year	(4,000)	pending
	BALANCE SHEET:	2019 (budget)	2019 (filed)
19	Beginning Net Assets	21,663	pending
21	Ending Net Assets	17,663	pending

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.

July 11 - 14, 2019: Readercon 30, Quincy MA.

July 12 - 14, 2019: Shore Leave 41, Baltimore MD.

August 15 - 19, 2019: 77th World Science Fiction Convention, Dublin, Ireland

September 13 - 15, 2019: Albicon 2019, Albany NY.

October 18 - 20, 2019: Capclave 2019, Rockville MD.

October 21 - 25, 2019: 70th International Astronautical Congress, Washington DC.

November 8 - 10, 2019: Philcon 2019, Cherry Hill NJ.

April 26, 2020, 1300 EDT: Twenty-Sixth SETI League Annual Membership Meeting, Little Ferry, NJ.

May 22 - 26, 2020: Balticon 54 Baltimore Science Fiction society Annual Convention, Baltimore MD.

August 15 - 23, 2020: 43rd COSPAR Scientific Assembly, Sydney Australia.

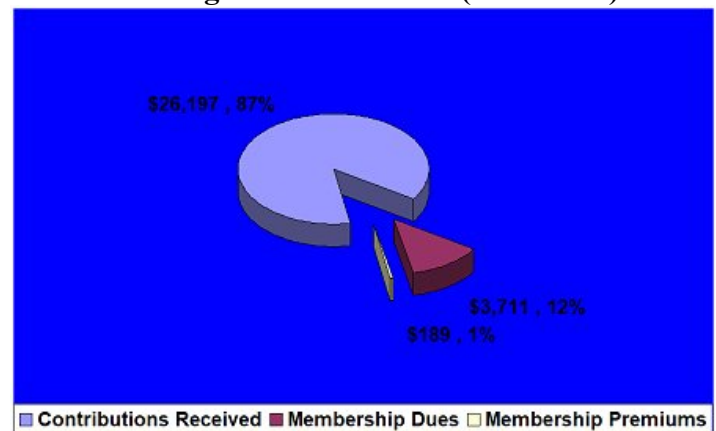


SETI League members are encouraged to nominate SETI-relevant websites for our monthly SETI SuperStar Award. Nominating emails to our Awards Committee may be sent to: Awards_at_setileague_dot_org. Please be sure to indicate the URL of the candidate website you are nominating, and a brief explanation as to why you consider the site worthy of recognition.

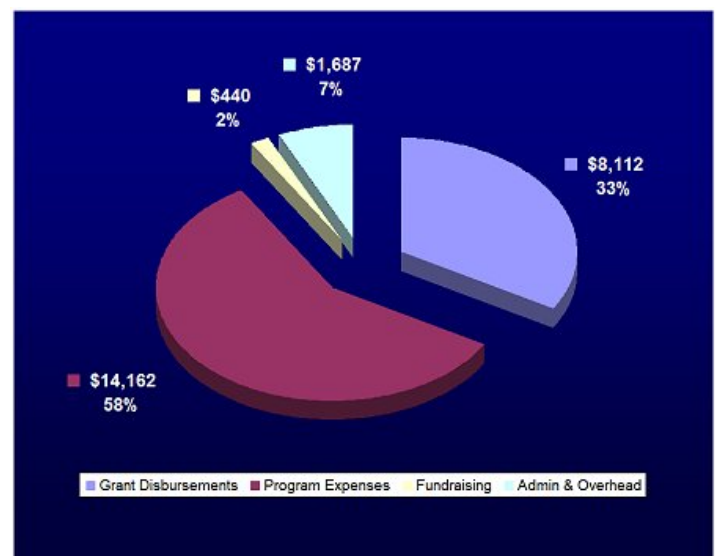


(left to right:) Richard WA2IKL, Bill KC2RST, Mark KC2ORE, and Paul N6TX gathered at SETI League headquarters in New Jersey on Sunday, 14 April, for our 2019 Annual Meeting.

SETI League 2018 revenues (unaudited)



SETI League 2018 expenses (unaudited)





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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 2018 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.

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: _____

Order Your Membership Premiums:

	(US)*	(E)*
Pocket protectors	\$ 3	\$ 4
Mouse pads	\$ 5	\$ 7
<i>Tune In The Universe! (CD-ROM)</i>	\$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 a Song of SETI (Songbook)</i>	\$10	\$13
<i>Sing More Songs of SETI (Songbook)</i>	\$10	\$13
<i>Sing a Song of SETI (music CD)</i>	\$15	\$18
<i>Sing More Songs of SETI (music CD)</i>	\$15	\$18
<i>Demented! (music CD)</i>	\$15	\$18
T-shirts, specify M, L, or XL	\$15	\$22
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

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