



SearchLites

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The Quarterly Newsletter of The SETI League, Inc.

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Alien Satellites Might Offer a New Way to Find ET by Seth Shostak, Senior Astronomer, SETI Institute

From *nbcnews.com*, 19 March 2018, used by permission

It's another scheme for finding the Romulans or the Borg — and it definitely has some advantages. The usual approach to looking for alien societies is to scan the skies for signals like radio transmissions or bright, flashing lasers. Either would tell us that someone's out there.

Lamentably, these schemes have a troublesome drawback: the need for synchronicity between the sender (aliens) and the receiver (us). What are the chances that, when our attention is directed to a particular planetary system, their transmitters are aimed our way? It's like two pairs of eyes meeting across a crowded casino. It might not happen.

That's why a detection scheme that doesn't depend on synchronicity — like the one proposed in a new paper published in *The Astrophysical Journal* — has such great appeal. The idea is to hunt for evidence that's always around — artifacts that might even outlast the extraterrestrials themselves, in the same way that fossilized bones reveal the long-gone dinosaurs. We've never seen a T. rex, nor heard its roar. But we have no doubt that they once stomped across the landscape.

Maybe we could sniff out our bumpy-headed brethren by examining the atmosphere around their home planet. For example, we might use instruments to look for the presence of chlorofluorocarbons — the woeful result of too much Klingon hairspray.

Sadly, detecting this gas from light-years away is beyond the capabilities of even the biggest telescopes. But there's another kind of artifact that might be possible to find. Spanish astronomer Hector Socas-Navarro argues in the paper that we might look for artificial satellites around distant planets. After all, satellites are something you might expect any respectable alien society to have.

For us earthlings, satellites serve a multitude of functions, including spying on our enemies, enabling GPS, and furnishing the endlessly fascinating imagery you can peruse on Google Earth.

But one subclass of the 3,000 or so satellites swarming around Earth is particularly useful: the 400 that pirouette around the planet at roughly 22,000 miles above the equator. At that altitude, these so-called geostationary satellites complete one orbit every 24 hours, the same rate at which the Earth spins. Consequently, they appear fixed in the sky. That makes them especially handy for photographing the weather, relaying international phone calls, and beaming down satellite TV.

Now suppose there are aliens out there who are substantially more advanced than we are. Their planet might be orbited by billions or trillions of geostationary satellites instead of our measly 400. And astronomers might be able to detect this orbiting thicket of space hardware when the planet comes between us and its host star — what astronomers call a transit.

If this were to happen, the dimming of starlight caused by the planet would be preceded and then followed by a very slight dimming by its satellite necklace. This would be especially pronounced if we saw the necklace edge-on, which would block out more starlight and thus be more noticeable.

The beauty of this scheme is manifold. To begin with, there's no synchronicity problem, so the aliens don't need to make any effort to get in touch. Even if they managed to blow themselves to smithereens millions of years ago, their satellites might still be around to mark their collective grave.

In addition, this approach requires no new telescopes nor even any new experiments. Astronomers would only need to do a careful check of data that's already been collected in the search for exoplanets.

Despite what you see on TV and in movies, we're unlikely to meet aliens anytime soon. In fact, we're not even sure aliens are out there. But Socas-Navarro's idea of looking for massive satellite swarms is a clever one. Its chances for success may not be great, but it's easy to try. And there's no winning this game without playing.



Guest Editorial

Ironic Rebels

by Dan Duda

**from the May, 2018 issue of Penn Central,
the monthly newsletter of Central PA Mensa,
used by permission**

There's something unsettling about established orthodoxy, especially in science. Progress requires looking at the world in whole new ways. But as soon as you become welded to already "proven" ideas; as soon as you stop looking forward and set your sights, instead, on reinforcing current thinking, the engine of creativity seizes-up and progress trickles to insignificance.

Two giants of science (especially particle physics) are poster boys for this outcome. Let's start with our favorite genius, Albert Einstein. As a patent clerk in 1905, what's known as his "miracle year," (it was just a few months) he wrote a series of five papers that upended our view of the universe. These include Special Relativity; Equivalence ($E=MC^2$); and Brownian Motion which proved for the first time that atoms exist and paved the way for the emerging field of particle physics.

He was a patent clerk because the science establishment shunned him. His ideas and his way of thinking didn't fit their structure. In fact, he was the extreme opposite of science orthodoxy of the time. He challenged their ideas, so he was an outcast. But once he convinced other renegades to test his ideas, they became accepted theory, and he became an accepted leader of the science establishment. And there's the rub—as a leader in the field his incredible output of paradigm shattering thinking leveled off. He even rejected the core concepts of quantum physics of which he was a founding father. He just couldn't accept the "bizarre" conclusions that were a natural outcome of the results of experiments being conducted.

And here's the irony. Late in his career he joined forces with colleagues (Boris Podolsky and Nathan Rosen) to publish the EPR Paradox. It was a thought experiment designed to "prove" quantum science could not be right. Information could not cross the universe instantaneously—that would mean, in a certain sense, space did not exist.

However, during the 1970's and also more recently, the technology became available to put the paradox to a test. Surprise! We learned that information can and does move between separated particles with no time lapse. By trying to defend science orthodoxy Einstein uncovered

another major facet of reality—quite the opposite of his intent.

The other ironic rebel of particle physics was Erwin Schrodinger. He had a problem with the Copenhagen Interpretation of quantum reality. Like Einstein, he developed a thought experiment to prove how "silly" the QM view of reality was. Fortunately (or unfortunately, depending on your take of QM) continued experiments support the "Observer Effect" on subatomic particles. The real nature of a particle changes when it is observed. So, the Copenhagen interpretation of reality is still quite viable. It remains to be proven what impact this effect has on larger objects, like people or planets. But there are legitimate hypotheses in support of even this bizarre conclusion on a macro-level as well.

As with Einstein, Schrodinger was a founding father of quantum mechanics. In addition to his "dead and alive cat" he is well known for the famous Schrodinger equation which predicts what characteristics in a cloud of possibilities will emerge at a given point. Once again, I'm convinced that the real breakthroughs in science are still ahead. We understand almost nothing about reality. In the words of John Gribbin (*In Search of Schrodinger's Cat*):

"In the world of the very small, where particle and wave aspects of reality are equally significant, things do not behave in any way that we can understand from our experience of the everyday world...all pictures are false, and there is no physical analogy we can make to understand what goes on inside atoms. Atoms behave like atoms, nothing else."

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-Fourth Annual Membership Meeting

22 April 2018, 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. Three SETI League members in good standing are present. The SETI League currently has 109 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 2017 Membership Meeting

The Minutes of the 2017 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 2017 (as e-filed).

1. Revenues: Dues and Contributions \$24,231; Interest Income \$5; Total \$24,236.
2. Expenses: Grant Disbursement \$1,000; Educational/Scientific Programs \$14,878; Management/General \$2,166; Fundraising \$1,000; Total \$19,044.
3. Revenues minus Expenses: \$5,192.
4. End of 2017, SETI League account balances equalled \$14,495. 2017 beginning net assets \$9,603.
5. 2018 Budget: Projected Revenues \$29,000; Grant Disbursements \$14,000. Program Expenses \$12,000; Management/General Expenses \$2,000; Fundraising Expenses \$1,000; Total Expenses \$29,000; Projected excess \$0; Projected Ending Balance \$14,795.
6. This report was accepted by those present.

• Executive Director's Report

During 2017, 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 Sebring FL, Baltimore MD, 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 one press release and conducted several press interviews
6. served as co-chair and webmaster for the IAA SETI Permanent Committee (for half the year)
7. responded to several dozen email and telephone inquiries from members and prospective members.

• Committee Reports

Membership

No report.

EME Committee

No activity.

OSETI Committee

Mr. Factor reports that the SETI Institute has developed an OSETI kit, and he has approached them about obtaining one to use at his Sedona AZ location.

Awards Committee

Awards Committee chairman David Ocame being absent, report provided by Dr. Shuch. There were no Giordano Bruno Awards or Orville N. Greene Awards presented for contributions during 2017, due to a lack of nominations. Nominations during 2018 will be solicited. Twelve websites have been given the SETI SuperStar award this year. More nominations are requested from the members. Paul will note this in an upcoming 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, a photojournalist from the UK has chosen the VSA as the backdrop for a photo essay about citizen science, which was shot in May, and DirecTV has contacted Prof. Shuch about shooting an upcoming documentary there in the near future.

2. Mid-Year Renewal Letter

Last May, Ms. Wood emailed a mid-year appeal to lapsed members, which generated xxx responses. The November renewal letter generated a few more renewals of lapsed members. These mailings will continue for 2018.

3. Annual Report

Although the formal Annual Report has been discontinued, annual status 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

Prof. Shuch reports that he and Mr. Kitchen continue to work toward establishing a facility for optical transmissions into space, as a virtual (digital) backup of Planet Earth. The project's 501(c)(3) nonprofit status is still pending. In the interim, tax-deductible contributions for the project are being made to The SETI League. Prof. Shuch has used these funds to award a grant to the Engineering department at Florida Institute of Technology, to help develop and test the required hardware and software.

• New Business

○ Next Meeting

The next Annual Meeting will be held on Sunday 14 April 2019. 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) generated over 1,300 "likes", numerous member posts, and considerable discussion among members.
- The SETI League congratulates Pres. Richard Factor and Registered Agent Anthony Agnello on their recent receipt of a Technical Achievement Grammy award.

• Adjournment

The Annual Membership Meeting was adjourned by the Executive Director Emeritus at 14:07 hours EDT on 22 April 2018. A Regular Board of Trustees meeting followed a brief recess.

Business Transacted by the Board of Trustees:

Quorum Call

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

Trustees and Officers absent: Martin Schreiber. A quorum is present.

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

Personnel matters

An executive session was convened for the conduct of Personnel reviews.

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.

Annual Budget

The draft 2018 Budget is adopted by the Board.

Advisory Board

The Executive Director Emeritus thanks members of our Advisory Board for their more than two decades of service.

Bank Fees

The Secretary/Treasurer reports that our bank has removed the \$3 monthly imaging fee. We still pay an \$18 monthly account fee. She has continued to query banks as to the availability of a free non-profit checking account; all require that we maintain an unrealistic monthly balance.

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.

Press List

Ms. Wood had previously suggested migrating our email Press List to Mail Chimp, and was authorized by the Board to do so. She reports difficulties in uploading the appropriate file, and will try again.

Telecommunications

Ms. Wood continues to retrieve voice-mail messages periodically via cell-phone. Prof. Shuch requests she do so at least once per week. She reports that the vast majority are spam calls.

Last year, Mr. Factor was tasked with investigating use of PHP-BB on our server. He reports that he declines to implement PHP, due to security concerns.

New Business

Ms. Wood reports that the SETI League logo trademark has been renewed.

Scheduling of Next Meeting

The SETI League Board of Trustees will next meet on Sunday, 14 April 2019, immediately following the 25th Annual Membership Meeting, in Little Ferry NJ.

Adjournment

The Board of Trustees meeting was adjourned at 14:26 EDT.



2018 SETI League Budget

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

990 Line	REVENUES:	2018 (budget)	2018 (filed)
1d	Dues, Grants & Contributions	29,000	pending
4	Interest & Investments	0	pending
12	Total Revenues:	29,000	pending
	EXPENSES:	2018 (budget)	2018 (filed)
10	Grants	14,000	pending
13	Educ. and Scientific Programs	12,000	pending
14	Management & General	2,000	pending
15	Fundraising	1,000	pending
17	Total Expenses:	29,000	pending
18	Excess or (Deficit) for the year	0	pending
	BALANCE SHEET:	2018 (budget)	2018 (filed)
19	Beginning Net Assets	14,795	pending
21	Ending Net Assets	14,795	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 22 - 25, 2018: Society of Amateur Radio Astronomers Conference, NRAO Green Bank, WV.

August 16 - 20, 2018: 76th World Science Fiction Convention, San Jose CA.

September 28 - 30, 2018: Mid-Atlantic States VHF Conference, Bensalem PA.

October 1 - 5, 2018: 69th International Astronautical Congress, Bremen, Germany

November 16 - 18, 2018: Philcon, Cherry Hill, NJ.

February 15 - 17, 2019: Boskone 56 Science Fiction Convention, Boston MA.

April 14, 2019, 1300 EDT: Twenty-Fifth SETI League Annual Membership Meeting, Little Ferry, NJ.

May 24 - 27, 2019: Balticon 53 Baltimore Science Fiction society Annual Convention, Baltimore MD.

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

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



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.



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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 2017 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!</i> (music CD)	\$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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