



# SearchLites

Vol. 30 No. 1, Winter 2024

The Quarterly Newsletter of The SETI League, Inc.

**Offices:**

433 Liberty Street  
Little Ferry NJ  
07643 USA

**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 © 2024 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.**

## Downsizing

by H. Paul Shuch, Executive Director Emeritus

Regular readers of this newsletter are doubtless aware that my wife, Muriel Hykes, passed away a few months ago after a prolonged illness. Thus, I now find myself rattling around in a six bed-room, four bath, three story house with a four car garage, sitting atop 1/3 of a hectare of semi-rural hilltop in Hepburn Township, just north of Williamsport PA. Though the five sons Muriel and I raised here are long grown and gone, with families of their own, considerable other wildlife abounds in the virgin forest just behind the mostly empty house. Despite the idyllic surroundings, it is clearly time for me to downsize.

The ground level story of this sizeable residence houses the microwave circuits laboratory where I was privileged to develop numerous radiotelescope receivers, antennas, amplifiers, and back-end processors in support of The SETI League's educational and scientific mission. Just behind the lab sits the very first Project Argus station, now technologically obsolete but still marginally operational. Between that dish and the aforementioned forest, surrounded by a grove of forty tall Arbor Vitae trees, sits the still uncompleted Very Small Array, a test-bed and prototype for future SETI research radiotelescopes.

The VSA project ground to a halt with the 2007 global financial crisis, before its planned front-end and back-end electronics could be completed and installed. But, it served as a proof-of-concept which facilitated the issue of US Patent Number 6,593,876, "Adaptive Microwave Antenna Array," upon which much larger, more capable phased arrays may some day evolve. All of the above is thoroughly documented at <http://setileague.org/vsa>.

The uncompleted VSA stands now as a testament to the tenacity of SETI science. I would hate for it, and the lab, to be parceled out to a salvage yard when I sell my house. But, maybe there's another way.

One of the few positive aspects of the recent COVID pandemic has been that it has taught many of us how to work from home. Might some enterprising SETIzen perhaps desire to escape big city life, settle in to a large house in the rolling hills of Central Pennsylvania, and continue the work I started here? If so I invite you, interested reader, to drop me an email to [drseti@verizon.net](mailto:drseti@verizon.net). Come out for a short vacation (I certainly have plenty of vacant guest rooms!), take a look at the lab, the array, and -- oh, yes, the house, and maybe you'll want to play Let's Make a Deal.

The market value of a residential property can be easily estimated by a qualified real estate appraiser. But what is the value of preserving a piece of SETI science history? To borrow a catchphrase from the MasterCard advertisements... Priceless!

## **Attosecond Physics**

**by Dan Duda**

from the December 2023 issue of *Penn Central*, the monthly newsletter of Central Pennsylvania Mensa, used by permission

At the beginning, humans had only our in-born senses to explore the world around us. Whatever drives the process of evolution gave us the ability to sense danger and opportunity - the features most necessary for survival in our environment. Among many advantages, we are able hear potential prey and predators. We can see, giving us an opportunity for 'fight or flight.' The sense of smell signals the relative safety of food we are about to consume, etc.

As we developed abilities beyond our native senses, we found ways to explore a wider range of our environment with tools like telescopes and microscopes. We discovered details of planets and galaxies, and we were able to peer into our bodies to diagnose and deal with potential problems.

Let's fast forward to more recent developments. High on the list are the Hubble and the James Webb space telescopes. These allow us to study objects close to the beginning of time. Amazing knowledge is already flowing like fruit from a cornucopia.

And even more recently, we have Attosecond Technology. At first glance, the term 'attosecond' might seem like something out of a sci-fi novel, but in reality, it opens a window into the astonishingly fast-paced world of the microcosm (i.e., particle physics). This is a new and fascinating field of study that deals with the measurement and manipulation of time on an incredibly short timescale.

An attosecond is one quintillionth of a second, or 0.000000000000000001 seconds. This gives scientists access to a fundamental process that was previously unavailable. For example, it takes electrons 150 attoseconds to go around the nucleus of a hydrogen atom. This means that attosecond physics has the potential to revolutionize fields such as electronics and chemistry.

It can also be used to develop new materials with unique properties. This process works by using high powered lasers that produce pulses of light for incredibly short periods. The trick is that "...the 'high harmonics' emerge as the laser light rips an electron from a gas atom and then shoves it back in, causing it to emit light." [science.org] These can be used to observe and possibly even manipulate electrons.

In the realm of attosecond physics, scientists are not just observing the dance of particles on an incredibly fast stage; they are learning to choreograph it. This new-

found ability to control and understand the ultra-fast processes at the heart of matter and light holds the key to advancements that will shape the future of technology and deepen our understanding of the universe's most fundamental aspects. This could be the development that breaks down the wall and leads to a revolution in fundamental physics.

In the immortal words of Jonathan Duda "Hey grandpa, you should write an article on Attosecond Physics." And so I did.

## **Minutes of SETI League Special Board of Trustees Meeting**

In accordance with Article V Paragraph 4 of our Bylaws, a Special Meeting of the SETI League Board of Trustees was called by our President, and convened by our Executive Director Emeritus, at 7 PM Eastern Standard time on Saturday, 18 November 2023 via the Zoom teleconferencing platform. Trustees present: Dr. Shuch, Mr. Factor, Ms. Woods. Trustees absent: Mr. Schreiber. Trustees present constituted a quorum. Per Article V Paragraph 5, the lack of customary ten day advanced notice was waived by virtue of attendance of a quorum of trustees without protest.

In response to suggestions from our Special Projects Coordinator, Mr. Factor expressed a desire to provide the membership with improved services rendered, while encouraging and incentivizing a higher level of membership participation in SETI League activities. Various alternatives were discussed. Ms. Wood reported the breakdown of current membership numbers in the various categories.

The following motion was proposed by Dr. Shuch, seconded by Ms. Wood, and passed unanimously:

"The Board of Trustees may, by majority vote, elect to elevate any SETI League member to a higher level of membership in recognition of exemplary service to, or support of, the Mission of The SETI League Inc."

The above language is hereby added to the online SETI League Policy Manual, Part 10, Membership Categories and Terms, as Paragraph 17, and in accordance with Paragraph 21 therein, has the force and effect of Bylaws of the SETI League Inc.

There being no further business before the Board of Trustees, the meeting was adjourned at 7:25 PM EST.

**Guest Editorial:**

## **Rationale for SETI**

Submitted by the Kavli Foundation

From our origins, humans have been inspired by pinpoints of light in the night sky. They cause us to wonder about our existence. Who are we? What are we doing here? Where did we come from? And, where are we going? Despite impressive investment and activity in space exploration over the years, the question remains unanswered.

This decade sees a once-in-a-lifetime investment into the ‘Search for Life Beyond Earth.’ Research communities, governments and philanthropists alike are set to explore. NASA’s Apollo program showed that sufficient commitment of resources can lead to breakthroughs. Their progress, culminating in the Moon landing, inspired many to become astronomers. Both NASA and ESA have active and planned missions focused on the detection and characterisation of exoplanets. Most large observatories have invested in planetary astronomy and “Big Data” approaches, including the upcoming Legacy Survey of Space and Time (LSST) at the Vera C. Rubin observatory and the radio Square Kilometer Array (SKA). Meanwhile, new Machine Learning (ML) algorithms will make the search for technosignatures feasible at scale.

We still do not know if there is life beyond Earth or how probable it may be. But if it exists, we might find it (or it us) as early as tomorrow. And, there or not, found or not, the search itself has a profound impact on humanity. Beyond science, the ‘Search for Life Beyond Earth’ raises complex questions of policy, law, philosophy, and theology. It challenges us to think critically about life as a category and as a thing of value. But we are not prepared for a discovery. This multi-disciplinary symposium will bring together diverse expertise to investigate and plan how we will assess evidence and communicate what we know (and don’t know) with the public. We should plan early, setting out impact assessments, protocols, procedures and treaties that allow us to act responsibly as individuals and communities and as a species. Any outcome will have to be presented to ‘Planet Earth.’

*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](http://www.setileague.org)) under *Event Horizon*, or email to us at [info@setileague.org](mailto:info@setileague.org), to obtain further details. Members are also encouraged to send in information about upcoming events of which we may be unaware.

**April 14, 2024, 1 PM EDT:** *SETI League Annual Membership Meeting*, virtually, via the Zoom platform. Members and guests should contact our Secretary via [hwood50@aol.com](mailto:hwood50@aol.com), to request Zoom log-on link.

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

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

**June, 2025** (dates to be announced): *Second Annual Penn State SETI Symposium*, State College PA.

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

**October 2026** (dates to be announced): *77th International Astronautical Congress*, Antalya, Turkey.



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 30 No. 1, Winter 2024**

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 2023 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](http://www.paypal.com) and specify that your payment be directed to [paypal@setileague.org](mailto:paypal@setileague.org).

Name: \_\_\_\_\_

**Order Your Membership Premiums:**

	(u)*	(o)*
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 2<sup>nd</sup> Edition</i>	\$20	\$30
<i>The Listeners</i> by James Gunn	\$15	\$21
<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
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

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

Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Phone: \_\_\_\_\_ email: \_\_\_\_\_  
 Ham call: \_\_\_\_\_ URL: \_\_\_\_\_  
 Contribution enclosed (US Dollars): \_\_\_\_\_