



SearchLites

Vol. 20 No. 3, Summer 2014
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/Registered Agent:

Richard Factor

Secretary/Treasurer:

A. Heather Wood

Executive Director Emeritus:

H. Paul Shuch, Ph.D.

Trustee:

Martin Schreiber, CPA

Advisory Board:

Anthony Agnello
Greg Bear
Paul Davies, Ph.D.
Robert S. Dixon, Ph.D.
Frank D. Drake, Ph.D.
Claudio Maccone, Ph.D.
Clifford Stoll, Ph.D.

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SETI League Launches Facebook Presence

Little Ferry, NJ., 13 April 2014 -- The SETI League, Inc., nonprofit leaders in the scientific Search for Extraterrestrial Intelligence, has recently adopted Facebook as its Social Networking outlet of choice. The group's new page at www.facebook.com/setileague will provide its members, staff, and interested members of the public and press with improved means of communicating their interest in, and progress with, the search for other life in space.



"When The SETI League was founded in 1994," explains Prof. H. Paul Shuch, the research group's Executive Director Emeritus, "the Internet was very young, and accessible only to techies. We launched a formidable Web presence, replete with several email discussion lists. The Computer Bulletin Board and Email Forum paradigm has become passe', long ago replaced by the current Social Networking milieu. Because we long concentrated more on SETI science than terrestrial communications, The SETI League is somewhat late to the table. We're now working to correct that."

The power of social networking became instantly evident to the SETI League leadership team, with more than 100 "Likes" to the prototype page on its first day, before it had even been announced to the League's worldwide membership base. "I'm pleased to note that a technical discussion emerged that first day," notes Shuch, "with members collaborating to calculate the precise gain of the Allen Telescope Array on a frequency of interest to SETI enthusiasts."

The SETI League hopes that participants in its former email discussion lists will gravitate to the group's new Facebook page, where they are encouraged to debate and dialog on SETI science, technology, and societal implications. "This is an open form, in which we encourage public participation," emphasizes Shuch. "Our Facebook page will be moderated only to the extent necessary to ensure that posts respect the spirit of The SETI League's stated vision and mission. Sometimes, the more outlandish the idea, the more it ends up enhancing human knowledge."

Largely using radio telescopes and optical telescopes, SETI scientists seek to determine whether humankind is alone in the universe. Since Congress terminated NASA's SETI funding in 1993, The SETI League and other scientific groups have privatized the research. Amateur and professional scientists interested in participating in the search for intelligent alien life, and citizens wishing to help support it, should email our Secretary/Treasurer at heather_at_setileague_dot_org, check the SETI League Web site at <http://www.setileague.org/>, send a fax to +1 (201) 641-1771, or contact The SETI League, Inc. membership hotline at +1 (800) TAU-SETI. Be sure to provide us with a postal address to which we will mail further information. The SETI League, Inc. is a membership-supported, non-profit [501(c)(3)], educational and scientific corporation dedicated to the scientific Search for Extra-Terrestrial Intelligence. ❖

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 20 - 22, 2014: *Contata*, Morristown, NJ.

June 29 - July 2, 2014: *Society of Amateur Radio Astronomers Conference*, National Radio Astronomy Observatory, Green Bank WV.

August 14 - 18 August, 2014: *Loncon3*, 72nd World Science Fiction Convention, London, England.

September 29 - October 3, 2014: *65th International Astronautical Congress*, Toronto, Canada.

November 21 - 23, 2014: *Philcon 2014*, Cherry Hill, NJ.

April 18, 2015, 0000 UTC - 2359 UTC:: Sixteenth annual SETI League *Ham Radio QSO Party*: 3.551, 7.0309, 7.2039, 14.084, 14.204, 21.306, and 28.408 MHz.

April 19, 2015: Twenty First SETI League *Annual Membership Meeting*, Little Ferry NJ.

April 24 - 25, 2015: *Southeastern VHF Conference*, Morehead, KY.

October 2015 (dates to be announced) : *66th International Astronautical Congress*, Jerusalem, Israel.

April 16, 2016, 0000 UTC - 2359 UTC:: Sixteenth annual SETI League Ham Radio QSO Party: 3.551, 7.0309, 7.2039, 14.084, 14.204, 21.306, and 28.408 MHz.

April 17, 2016: Twenty Second SETI League Annual Membership Meeting, Little Ferry NJ.

October 2016 (dates to be announced) : *67th International Astronautical Congress*, Guadalajara, Mexico.



Email Progress

After far too long an outage (which we greatly regret), we are pleased to inform our members and users that SETI League email service has been restored.

You may now reach our officers and administrators through the following email addresses:

- Secretary / Treasurer: heather_at_setileague_dot_org
- Webmaster / Executive Director Emeritus: paul_at_setileague_dot_org
- Memberships and Premiums: join_at_setileague_dot_org
- Contributions: paypal_at_setileague_dot_org
- General Information: info_at_setileague_dot_org



Contemplating Mortality

by H. Paul Shuch

Executive Director Emeritus

In the last issue of *SearchLites*, I had the sad duty of reporting to you the passing of Tom Pierson, my counterpart at the SETI Institute. Tom was four years my junior and, although I knew about his long battle with cancer, I somehow always thought he'd outlive me. So, his death forces me to stare my own mortality squarely in the face.

Tom was more than just a professional colleague; in the three decades we knew each other, he became a friend, advisor, and confidant. By the time The SETI League was founded, Tom had already headed up our (admittedly larger and better known) sister organization for a decade. We had met in that organization's early days, at a SETI conference organized by Tom at the California Academy of Sciences. At the time, I was an academic trying to incorporate SETI science into my engineering curriculum. Tom was already a seasoned administrator (a job to which I never particularly aspired).

When founder Richard Factor tapped me as The SETI League's first Executive Director, one of the first people I contacted was Tom Pierson. His wealth of administrative experience made it possible for him to guide me through the paperwork morass of creating bylaws and operating rules and policies and procedures. If you look closely, you will see his fingerprints all over The SETI League's website. Ever generous with his time, Tom also took the extra step of becoming a SETI League Charter Member. His membership would gladly have been issued gratis, but Tom insisted on paying his dues.

What Tom's passing reminds me is that SETI is most likely a multi-generational pursuit. It is altogether possible that not one of us now involved in SETI science will still be sentient when success is finally achieved. Owing to his long illness, I think Tom knew this, perhaps better than the rest of us. Not that it deterred him.

Or, we could hit paydirt tomorrow (Tom would have liked that). We just don't know. Whatever success the SETI Institute achieves, whether longterm or short, is a lasting legacy to Tom Pierson's passion and tenacity. I could ask for no better a role model as I contemplate our place in the cosmos, and the brevity of our individual existence.

RIP, Tom.



Guest Editorial

Kepler-186f: Close to Earth Size, in the HZ
by Paul Gilster

from his *Centauri Dreams* blog, used by permission

We have another ‘habitable zone’ planet to talk about, one not much bigger than the Earth, but it’s probably also time to renew the caveat that using the word ‘habitable’ carries with it no guarantees. The working definition of habitable zone right now is that orbital distance within which liquid water might exist on the surface of a planet. Whether it actually does is just one of the questions. A second is whether or not we’re in fact dealing with a rocky terrestrial world.

So we the announcement of Kepler-186f with guarded enthusiasm for an exoplanet that looks interesting indeed. Five planets circle this star, an M-dwarf a great deal smaller and cooler than the Sun. Discovered by the Kepler space observatory, the planet presents us with transit information telling us that it is about 1.1 Earth radii, although we don’t yet know what the mass of this world is, and hence can’t make a definitive call on whether or not it is rocky. But Stephen Kane (San Francisco State), one of the researchers involved in today’s announcement, thinks we have reason to think that it is:

“What we’ve learned, just over the past few years, is that there is a definite transition which occurs around about 1.5 Earth radii,” said Kane. “What happens there is that for radii between 1.5 and 2 Earth radii, the planet becomes massive enough that it starts to accumulate a very thick hydrogen and helium atmosphere, so it starts to resemble the gas giants of our solar system rather than anything else that we see as terrestrial.”

Kepler-186f is thus well below the value where we would expect it to accumulate a thick hydrogen and helium envelope, causing Kane to add “there’s a very excellent chance that it does have a rocky surface like the Earth.” If that’s the case, then we have a planet on the outer edge of its star’s habitable zone, though one that may have a somewhat thicker atmosphere than Earth’s because of its somewhat larger size. Perhaps the surface can avoid freezing. In any case, this is what lead author Elisa Quintana (NASA Ames) calls “the first definitive Earth-sized planet found in the habitable zone around another star.” The work appeared in Science.

The discovery team used so-called ‘speckle imaging’ in obtaining its high resolution observations from the eight-meter Gemini North telescope on Mauna Kea as well as adaptive optics observations from the ten-meter Keck II telescope to rule out extraneous sources that could ac-

count for the Kepler data, concluding that the signal has to be that of a transiting planet. The speckle data allowed direct imaging of the system to within 400 million miles, confirming there were no other stellar-sized objects orbiting within this distance from the star. “The Keck and Gemini data are two key pieces of this puzzle,” adds Quintana. “Without these complementary observations we wouldn’t have been able to confirm this Earth-sized planet.”

The new planet orbits its star once every 130 days, receiving about a third of the heat energy that Earth does from the Sun. The four inner planets — Kepler-186b, Kepler-186c, Kepler-186d, and Kepler-186e — are all too hot for life as we know it, with periods of 3, 7, 13 and 22 days.

The objection to Kepler-186f as a home for life rests on the dangers of orbiting an M-dwarf, a class of star prone to flare activity. Move a planet close enough to the star to be in its habitable zone and the assumption is that it’s also tidally locked, presenting the same side to the star throughout its orbit, with all the complications that brings to climate models. Neither of these factors are complete show-stoppers — some climate studies show that temperature extremes can be mitigated by winds or ocean currents — and in the case of Kepler-186f, we do have a world on the habitable zone’s outer edge, perhaps far enough out not to suffer tidal lock.

So it’s an interesting place, this new world, about 490 light years away in the constellation Cygnus and thus tantalizingly out of reach for atmospheric analysis even with instrumentation planned for the near future. The James Webb Space Telescope itself won’t be able to help us with that task. But it’s pleasing to note that Kepler-186f has been studied over a frequency range of 1 to 10 GHz looking for emissions, though none has so far been found. Getting a detectable signal here from this star would require a transmitter between 10 and 20 times as powerful as the planetary radar system at Arecibo. SETI keeps coming up empty, but good for us if, in addition to our other studies, we keep our ears open for a long-shot detection.

The paper is Quintana et al., “An Earth-Sized Planet in the Habitable Zone of a Cool Star,” Science Vol 344, No. 6181 (18 April 2014), pp. 277-280.

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.



Remembering:

Tony Monteiro

I'm deeply saddened to report that our friend and fellow SETI League member Tony Monteiro, AA2TX, passed away recently at the age of 55. Vice President of Engineering for our sister organization AMSAT, Tony was, among many other things, a gifted antenna designer who helped me to develop the SETI Horn of Plenty antenna a dozen years ago. Below is a remembrance from AMSAT president Barry Baines, WD4ASW.

H. Paul Shuch, Executive Director Emeritus

AMSAT VP-Engineering and Board Member Anthony J. Monteiro, AA2TX of North Andover, MA died on Wednesday morning, March 26, 2014 while hospitalized in Boston, MA from cancer. He was 55. He is survived by his wife, Mary Lou and daughter, Veronica, a college freshman.

Tony was first licensed in 1973 as a Novice and subsequently held an Extra Class Amateur Radio License. An avid operator, he described his first contact in an AMSAT BoD Candidate's Statement in 2011: "I earned my novice ticket in 1973 and made my first ham radio contact with a transmitter made from parts out of an old TV set. A Heathkit HR-10B receiver and a 65-foot piece of wire strung out of a window for an antenna made up the rest of my station, which was pretty modest even by 1973 standards! Even so, I will never forget the thrill of my very first contact."

His interest in amateur radio and electronics led him to earn a BS in Electrical Engineering from Drexel University and a MS in Computer Science from Stanford University. His professional career started at Bell Laboratories in New Jersey developing network management systems and then consumer products. After working at several startup companies, Tony landed at Cisco Systems where he managed the development of ADSL, voice over packet, and content networking products. He retired from industry in 2002 and focused his efforts working on satellite projects.

Tony joined AMSAT in 1994 and started working the satellites. He earned ARRL VHF/UHF Century Club-Satellite #58 and worked 49 states (only Hawaii was not logged) as well. Tony worked a number of stations while he commuted along the I-495 corridor outside Boston. Many will remember working him through AO-40 as he utilized his "cardboard box horn antenna." Tony led a workshop at the 2003 AMSAT Space Symposium where students built similar antennas, demonstrating the ease in which one could build a 2.4 GHz S-band antenna to receive the AO-40 downlink.

Additional technical contributions to the amateur satellite community that Tony made included "InstantTune Automatic Radio Tuning" software, "A Simple Desense Filter for Echo", and several extremely low cost projects such as "A \$5 Mode V/S Adapter using a Sub-Harmonic Mixer". AMSAT-UK currently offers a 70 CM Parasitic Lindenblad antenna based upon his design.

Tony also played a significant role in space-based hardware development. He collaborated on the NO-60 satellite. As AMSAT's VP-Engineering, he served as the software designer for the SDX (Software Defined Transponder) on ARISSat-

1/Kedr that was deployed from the International Space Station by Russian Cosmonauts during a space walk in August 2011. Tony led the Fox-1 Engineering Team from inception in 2009 and led AMSAT's efforts to apply for acceptance of Fox-1 in the NASA Education Launch of NanoSat (ELaNA) in 2011 and Fox-1B in 2012. He established relationships with several universities to secure scientific payloads for Fox-1 and Fox-1B, including student experiments.

A strong proponent of student involvement in satellite projects, Tony served as coordinator of AMSAT Engineering relationships with SUNY-Binghamton, Penn State-Erie, Virginia Tech, and Rochester Institute of Technology where students developed new technologies to be applied in future AMSAT spacecraft as "Capstone" projects. These projects, such as the development of storage capacitors to replace batteries developed by SUNY-Binghamton, provided student experiences that will ultimately be flown in space. The AMSAT JOURNAL in recent years featured several articles concerning these projects.

Tony was elected to the AMSAT Board of Directors in 2011 following service for one year as a BoD alternate. His wise counsel and focus on finding ways to make it affordable for AMSAT to fly amateur radio systems in space resulted in several innovative approaches. It was Tony that convinced the NASA ELaNA program to modify their qualification criteria to add "not for profits" to those that could apply for launch grants. It was Tony that met with universities that were looking for ways to fly their payloads but didn't have the experience to build satellites, encouraging collaboration that would benefit both AMSAT and the university.

Tony's approach to participation in the AMSAT Leadership Team reflected his approach to life. Whenever he had a thought to share with the entire AMSAT Board of Directors and/or Senior Officers via e-mail, he always started with "Dear Friends". As AMSAT VP-Operations Drew Glasbrenner, KO4MA noted, "I always admired how he reminded me we were all friends despite whatever argument was raging."



Minutes of the Twentieth Annual Membership Meeting

13 April 2014, Eventide Inc., Little Ferry, NJ

- **Call to Order**

The meeting was convened at 13:02 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 present. Our Bylaws requiring one percent of the current membership to be in attendance for the conduct of SETI League business, the above represents a quorum.

- **Minutes of 2013 Membership Meeting**

The Minutes of the 2013 Membership Meeting having been previously posted to The SETI League's World Wide Web site, a motion was then passed to accept the minutes as posted.

- **Treasurer's Report**

Presented jointly by Dr. Shuch and Secretary/Treasurer Heather Wood, covering the calendar year 2013 (as e-filed).

1. Revenues: Dues and Contributions \$16,468; Interest Income \$1; Total \$16,469.
2. Expenses: Educational/Scientific Programs \$11,518; Management/General \$1,583; Fundraising \$1,460; Total \$14,561.
3. Revenues minus Expenses: \$1,908.
4. End of 2013, SETI League account balances equalled \$4,825. 2012 beginning net assets \$2,917.
5. 2014 Budget: Projected Revenues \$15,001; Program Expenses \$11,520; Management/General Expenses \$1,600; Fundraising Expenses \$1,450; Total Expenses \$14,570; Projected excess \$569; Projected Ending Balance \$5,394.
6. This report was accepted by those present.

- **Executive Director's Report**

The Executive Director's annual report of Program Service Accomplishments having been previously posted to The SETI League's World Wide Web site, a motion was passed to accept the report as published.

- **Committee Reports**

- **EME Committee**

Report by SETI League president and station trustee Richard Factor. The EME beacon remains off the air

following Mr. Factor's relocation to Arizona. He now has an antenna tower installed, and has retained a roofing contractor to confirm the structural integrity of his roof, as a future mounting location for an EME antenna. Thus, Mr. Factor has "started to begin contemplating whether to think about maybe considering" EME from his new 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 during 2013. Twelve websites have been given the SETI SuperStar award this year. More nominations are requested from the members. Paul will note this in the next 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.

2. **Mid-Year Renewal Letter**

Ms. Wood will email a mid-year appeal to lapsed members, with hardcopies to be distributed to members for whom we have no current email address. Last year's letter generated four or five reinstatements of lapsed members.

3. **Annual Report**

The SETI League's 2013 Annual Report is available to members via the website, in Portable Document Format (PDF). Ms. Wood will distribute hard-copies of this report to our major donors.

4. **Web Server**

Mr. Factor reports that new servers have functioned "satisfactorily and speedily" for two years now, and the website is online and working properly. Weekly web updates are currently being performed manually. Though our email server remains offline, we have successfully activated commercial email service, and will so notify our members via the website.

- **New Business**

- **Next Meeting**

The next Annual Meeting will be held on Sunday 19 April 2015. The date has been verified as not in conflict with Easter, Passover, or US tax season. The meeting will be at 1300 hours EDT, to be followed immediately by the Board of Trustees meeting. The date and time, as well as telepresence procedures if available, will be announced to the membership via the website and newsletter.

- **Good and Welfare**

- The SETI League has finally entered the 21st Century, by embracing Facebook as our social networking platform of choice. Press release distribution will henceforth be via our Facebook page www.facebook.com/setileague, and our former email discussion lists will be transitioned to Facebook forums in the coming weeks.
- Ms. Wood has secured a new Windows 8-based laptop computer for SETI League use, and will upgrade her applications software as required.

- **Adjournment**

The Annual Membership Meeting was adjourned by the Executive Director Emeritus at 13:30 hours EDT on 13 April 2014. A Regular Board of Trustees meeting followed.

Business Transacted by 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.

Personnel matters

No executive session was convened nor Personnel reviews conducted, as all persons involved expressed satisfaction with present performance and arrangements.
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, pending availability of funds and subject to periodic review.

Annual Budget

The draft 2014 Budget presented during the Membership Meeting was adopted.

Advisory Board

The Executive Director Emeritus will draft a letter to our Advisory Board members, thanking them for their continued service to The SETI League.

Bank Fees

The Secretary/Treasurer will terminate the bank account currently being used to process credit card payments (such account charging significant fees for this service), and arrange instead for credit card processing to be transacted via PayPal.

Registered Agent

The New Jersey Division of Revenue requires that we designate a Registered Agent to execute certain state documents. Mr. Factor was previously appointed to this post, but is no longer a New Jersey resident. The Secretary/Treasurer will determine State residency requirements with regard to this function, after which the Board will make the appropriate appointment.

Fundraising for New Horizons Message Initiative

The Board voted unanimously to offer assistance to this initiative in the areas of collection and disbursement of nonprofit contributions, under terms and conditions to be negotiated between the NHMI director and our Executive Director Emeritus.

Press List

In order to transition Press Release distribution from our own email list to Facebook, the Executive Director will draft an appropriate letter to members of the Press Corp, for distribution by the Secretary/Treasurer.

Adjournment

The Board of Trustees meeting was adjourned at 13:50 EDT.



Touching the Sky
(the story of the origins of AvSport)
Copyright © 2013 by Dr. H. Paul Shuch

[In previous issues of *SearchLites*, I've presented excerpts from my memoirs, recast in verse. In this installment, I reveal how I returned to aviation education, after a stint as a government contractor.]

That flight in the Aeronca Champ in 1961
Was not supposed to change my life, was only meant for fun.
Who knew it would propel me toward a new, uncharted course?
It's almost as if I were guided by an unseen force
That's leading me along a certain path for my own good...
But that sounds superstitious, and I'm never that (knock wood).

When military service was inevitable, I
Rejected Army, Navy, and Marines, to seek the sky.
The Air Force trained me in electronic combat from the ground,
And though I never earned my wings, I very quickly found
Affinity with those who flew the transports and the jets.
I knew I would return to flying some day, just not yet.

But when I left the service, "some day" didn't come around
For better than a decade, and by that time I had found
The resources to earn my ratings up through CFI,
So I could introduce a host of others to the sky.
It seems that flight instructing was as natural to me
As physics or as engineering. They all set me free.

Now, flight instruction in the USA had hardly changed
Since way before Pearl Harbor. I considered it quite strange
Curriculum development was failing to keep pace
With changes in technology. I may not be an ace,
But as an educator, I could see a better way.
I knew I'd have to try to change the status quo, some day.

Whenever you are working for somebody's FBO,
Upsetting their whole apple cart is not the way to go.
You teach the class exactly as the management decreed,
And do not rock the boat. It is as though you have agreed
That any innovation you are wishing to pursue
Will have to wait until the flying school belongs to you.

When that chance you've anticipated finally presents
Itself, you have to go with it, can't let it make you tense.
The new Sport Pilot rating was an opportunity
To change the flight school paradigm to what ought to be.
The timing was ideal, as I had recently retired,
And, as for the curriculum, I really was inspired.

It took me seven months to plan my business in detail,
From airport lease, to planes, to what to do if I should fail.
The normal aviation business plan requires some grit:
Decide up front how much to lose. Achieving that, you quit.
I traded in my Beechcraft on a Czech primary trainer.
No mortgages. No creditors. It couldn't get much plainer.

This whole new training model, and the lesson plans I made,
I shan't be sharing with you - they are secrets of the trade.
The bottom line: I crank out licensed pilots in ten weeks,
Good stick-and-rudder men and women learning my techniques.
And what's it cost me? Every extra minute of my life --
I thank the spirits I have such a great, supportive wife.

The Susquehanna Valley is the perfect place to fly;
The scenic hills and rolling river complement the sky.
Lock Haven is an ideal strip for training, it is clear,
With weather that's acceptable for forty weeks a year.
So if the blue sky beckons, and adventure you've been cravin',
Come out today and fly with me, at AvSport of Lock Haven.

The cost? Not insubstantial, because nothing good comes cheap.
I'm marginally profitable. Mostly, though, I reap
Inordinate returns when each new pilot earns his wings.
The income isn't much, but there are more important things.
When my accountant checks the books, and dares to ask me why
I do this, I say it's because I get to touch the sky.



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SearchLites Volume 20 No. 3, Summer 2014

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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 2013 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/c)*	(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	\$17
<i>Proceedings of EuroSETI04 (CD)</i>	\$15	\$17
<i>Proceedings of SETICon04(CD)</i>	\$15	\$17
<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</i> (Songbook)	\$10	\$13
<i>Sing More Songs of SETI</i> (Songbook)	\$10	\$13
<i>Sing a Song of SETI</i> (music CD)	\$15	\$17
<i>Demented!</i> (music CD)	\$15	\$17
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	\$43

***Includes postage to (u/c) US/Canada, 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: _____

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 Phone: _____ email: _____
 Ham call: _____ URL: _____
 Contribution enclosed (US Dollars): _____