SearchLites

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The Quarterly Newsletter of The SETI League, Inc.

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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.

Twelve Years and Counting

by H. Paul Shuch, Ph.D., Executive Director Emeritus

See how quickly time passes when you're having fun? I can hardly believe it's been over a dozen years since Richard Factor called me up with his ridiculous idea...

Richard and I had long been the kind of friends who spoke seldom, but always looked forward to our occasional encounters. These usually occurred about once per year, generally by telephone, often as not in December. As one year drew to a close and another was poised to begin, one of us would ring up the other for an hour's chat, as though we could that quickly play catch-up on a whole year of our lives.

Richard initiated the December, 1994 call. I hadn't seen him in the flesh for perhaps five years, back when I was still living in California. I was by now teaching in Pennsylvania, but Richard and I still shared an interest in ham radio, and aviation, and technology in general. And, it turns out, we also shared an interest in SETI.

"What's going on in your life?" asked Richard with his characteristically casual demeanor. "Any new jobs? Kids? Wives?" (This latter was something of an inside joke, as Richard prides himself in 'never having made the same mistake once.') Though I could only claim two out of three, we chatted for a while about the changes, both positive and negative, in our lives.

"Say," interjected Richard, mid-chat, "what do you know about SETI?" It was an interesting digression, but not an unexpected one, given Richard's short attention span and eclectic interests.

"Funny you should mention that," I replied. "Back in my Berkeley days, I got to know a bunch of the NASA SETI team: Jill, Barney, Kent, even Frank. And Jack was one of my advisors in grad school." (Last names, as Canadian science fiction author Rob Sawyer noted in his recent novel "Rollback", are irrelevant in that small and close-knit community.) "Pity about the cancellation of their project last year -- what was Congress thinking? Fortunately, I hear they're regrouping under private funding, and about to launch a continuation of HRMS -- something called 'Project Phoenix.' Ever heard of it?"

Richard had, so we proceeded to discuss the strengths, and weaknesses, of the SETI Institute and its efforts to keep SETI science alive in the wake of Congressional budget cuts. Being active radio amateurs, Richard and I agreed that hams represented a valuable, untapped resource that could greatly benefit the SETI enterprise.

And then, Richard dropped his bombshell. "I've just founded a SETI nonprofit of my own. How'd you like to head it up?"

Suddenly, an annual ritual had turned into a job interview. The rest of the story, how I took a leave of absence from my College, then raised some funding, ultimately resigning my Professorship to head up The SETI League, has been often retold, so I will not bore you with it again. The point is, this all started with a casual telephone call, now a full dozen years ago.

Eventually, I retired from The SETI League, was elevated to Executive Director Emeritus (all of the responsibilities, none of the benefits...) and most recently, un-retired back into academia. But The SETI League survives, thanks to the support and enthusiasm of our roughly 1500 members in 65 countries on 7 (!) continents.

So, where will the next dozen years take The SETI League? That question is on the agenda for my next annual phone chat with Richard, coming up any day now. ❖

Annual Meeting Notice

In accordance with Article IV, Section 1 of our duly approved Bylaws, the Trustees of The SETI League, Inc. hereby schedule our Thirteenth Annual Membership Meeting for 1 PM Eastern time on Sunday, April 29, 2007, at SETI League Headquarters, 433 Liberty Street, Little Ferry NJ 07643. Our office is located just two blocks north of Route 46 and one mile east of the Teterboro Airport, on the northwest corner of Liberty and Kinzley Streets.

We recommend that out-of-town members and guests flying in commercially use the Newark International Airport (EWR), which is about twenty minutes South of our office. There is a wide variety of hotels available at the Newark Airport. A rental car is recommended. From Newark, drive North on the New Jersey Turnpike to US Route 46 Westbound, cross over the Hackensack River, and two long blocks after the traffic circle, turn right onto Liberty Street.

Our members and guests using General Aviation are invited to use the Teterboro Airport (there *is* a landing fee). Of the half-dozen Fixed Base Operators offering transient parking, we recommend Atlantic Aviation (ask Ground Control for parking in the Atlantic Midfield). They should be able to assist you with ground transportation. Please coordinate your schedules and needs in advance through our secretary, Heather Wood.

As attendance by one percent of the League's membership constitutes a quorum, all members in good standing are encouraged to attend. The preliminary agenda for this meeting, per Bylaws Article XII, appears below.

Per Article IV, Section 3 our Bylaws, written or electronic notice of this Meeting is being provided to all members in good standing, not less than ten days nor more than ninety days prior to the meeting date. Members are encouraged to submit additional Old Business and New Business items for inclusion in the Agenda. Please email your agenda items to n6tx@setileague.org, not later than April 1, 2007.

The annual Board of Trustees Meeting required per Bylaws Article V, Section 3 will immediately follow the Membership Meeting. All SETI League members in good standing are welcome to attend.

Preliminary Agenda

- Call to Order
- Minutes of 2006 Membership Meeting
- Financial Report
- Committee Reports
- Old Business
- New Business
- Good and Welfare
- Adjournment ❖

SARA Call for Papers

Little Ferry, NJ.., December 2006 -- The Society of Amateur Radio Astronomers (SARA), a SETI League Affiliated Society that represents several hundred amateur radio astronomers around the world, hereby solicits papers for presentation at its 2007 Annual Meeting and Technical Conference, to be held July 1 - 3, 2007, at the National Radio Astronomy Observatory (NRAO), Green Bank WV. Papers on radio astronomy hardware, software, education, research strategies, and philosophy are welcome.

H. Paul Shuch, The SETI League's volunteer executive director, also serves as SARA vice president. In that capacity, he is coordinating this joint technical meeting. SARA members, SETI League members, or supporters wishing to present a paper should email a letter of intent, including a proposed title and informal abstract or outline (not to exceed 100 words) to the SARA vice president at vicepres@radio-astronomy.org, no later than 1 March 2007. Be sure to include your full name, affiliation, postal address, and email address, and indicate your willingness to attend the conference to present your paper. Submitters will receive an email response, typically within one week, along with a request to proceed to the next stage, if the proposal is consistent with the planned program.

A formal Proceedings will be published in conjunction with this Meeting. Papers will be peer-reviewed by a panel of SARA members with appropriate professional expertise and academic credentials. First-draft manuscripts must be received no later than 1 April 2007, with feedback, acceptance, or rejection emails to be sent within two weeks thereafter. Upon final editing of accepted papers, camera-ready copy will be due not later than 1 May 2007. Due to printer's deadlines, manuscripts received after that deadline will not make it into the Proceedings. Instructions for preparation of final manuscripts will be emailed to the authors of all accepted papers.

Last year's Proceedings was a landmark accomplishment for both organizations. Please help the Society of Amateur Radio Astronomers to make the 2007 edition even better! SETI League members in particular are encouraged to participate in this meeting by presenting their work for the benefit of the two sister societies. Further information about SARA can be found on their website, http://radio-astronomy.org.

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 join@setileague.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.

April 21, 2007, 0000 UTC - 2359 UTC: Eighth annual *SETI League Ham Radio QSO Party*, 14.204, 21.306, and 28.408 MHz.
April 27 - 28, 2007: 11th Annual *Southeastern VHF Conference*, Atlanta GA.
April 29, 2007, 1300 EDT: Thirteenth *SETI League annual membership meeting*, SETI League headquarters, Little Ferry NJ.
May 18 - 20, 2007: *Hamvention 2007*, Dayton OH.
June 1 - 3, 2007: *Rochester Hamfest*, Rochester NY.
July 1 - 3, 2007: *Society of Amateur Radio Astronomers* Conference, NRAO Green Bank WV.
July 26 - 29, 2007: *Central States VHF Conference*, San Antonio TX.
August 30 - September 3, 2007: *65th World Science Fiction Convention*, Yokohama Japan.
September 24 - 28, 2007: *58th International Astronautical Congress*, Hyderabad, India.
October 18 - 20, 2007: *Microwave Update 2007*, King of Prussia, PA.
October 2007 (dates TBA): *AMSAT Space Symposium*, Pittsburgh, PA.
November 16 - 18, 2007: *Philcon 2007*, Philadelphia PA.
April 19, 2008, 0000 UTC - 2359 UTC: Eighth annual SETI League *Ham Radio QSO Party*, 14.204, 21.306, and 28.408 MHz.
May 16 - 18, 2008: *Hamvention 2008*, Dayton OH.
May 30 - June 1, 2008: *Rochester Hamfest*, Rochester NY.
June 2008 (dates TBA): *Society of Amateur Radio Astronomers* Conference, NRAO Green Bank WV.
July 24 - 27, 2008 (Tentative): *Central States VHF Conference*, Wichita KS.
Mid August 2008 (dates TBA): *EME 2008*, Florence Italy.
September 30 - October 4, 2008: *59th International Astronautical Congress*, Glasgow, Scotland.
October 2008 (proposed - dates TBA): *AMSAT Space Symposium*, Orlando, FL.
April 18, 2009, 0000 UTC - 2359 UTC: Tenth annual *SETI League Ham Radio QSO Party*, 14.204, 21.306, and 28.408 MHz.
May 15 - 17, 2009: *Hamvention 2009*, Dayton OH.
May 29 - 31, 2009: *Rochester Hamfest*, Rochester NY.
June 2009 (dates TBA): *Society of Amateur Radio Astronomers* Conference, NRAO Green Bank WV.
October 2009 (dates TBA): *60th International Astronautical Congress*, Daejon, Korea.
October 2009 (proposed - dates TBA): *AMSAT Space Symposium*, Atlanta, GA.
April 17, 2010, 0000 UTC - 2359 UTC: Eleventh annual SETI League *Ham Radio QSO Party*, 14.204, 21.306, and 28.408 MHz.
June 4 - 6, 2010: *Rochester Hamfest*, Rochester NY.
June 2010 (dates TBA): *Society of Amateur Radio Astronomers* Conference, NRAO Green Bank WV. ❖

Don't Expect an Alien Sitcom

by Paul Gilster, gilster@centauri-dreams.org

Since we've kicked around the idea of searching for SETI signals in the television bands, it's interesting to note SETI scientist Seth Shostak's thoughts on the subject. Because although planet Earth has been broadcasting TV signals for some time now, our transmissions are unlikely to be received at any great distance. And that makes a search for accidental TV-like emissions even from relatively nearby stars problematic.

Shostak imagines a civilization 55 light years away hoping to pick up *I Love Lucy* from Earth. He notes that the non-directional TV signal, assuming a million watts of transmitter power, will reach this distant world "...with a power density of about 0.3 million million million million millionths of a watt per square meter..." And because only a third of the transmission power is in the carrier signal — the most readily detected part of the transmission — even that number is too high.

It's possible to run these numbers against a new facility, the Low-Frequency Array (LOFAR) now being built in Europe for radio astronomy work. At VHF television frequencies, LOFAR will have an effective collecting area similar to that of the Arecibo dish. Says Shostak:

That's big. That's brawny. But not brawny enough. In our SETI experiments at Arecibo, we could find a signal if it were about 0.1 million million million millionths of a watt per square meter. That number, you will notice if you count up the words, is a million times bigger than the *I Love Lucy* carrier at 55 light-years. The aliens' LOFAR would be inadequate to detect the broadcast by a factor of a million, a not entirely negligible amount. Simply stated: LOFAR couldn't hear it.

That's bad news for our hopes of picking up extraneous signals from a technological civilization. It doesn't disqualify these frequencies from SETI study, but does imply that if we were to find something interesting, it probably wouldn't be an extraterrestrial sitcom. If any readers have references to other work on the strength of such signals at interstellar distances, please let me know. It's a question that bears on how visible our own culture is at the distance of nearby stars. The answer may well be that despite *I Love Lucy*, we're still all but undetectable.

This article first appeared on the Centauri Dreams *website (www.centauri-dreams.org), and is used here by the kind permission of the author.* ❖

Guest Editorial:

At what point would you abandon the search?

by Seth Shostak, Public Programs Scientist, SETI Institute

That's a question I get relatively frequently from folks who think that SETI may be a quixotic quest, as futile as searching for the Seven Cities of Gold. After all, modern efforts to find signals from extraterrestrial transmitters are now in their fifth decade. Could it be that those of us who still hope to tune in other worlds may be missing some writing on the wall? Some dead-obvious, chiseled text with a simple, if disappointing message: "There are no aliens"?

The question seems fair, since SETI's obvious analogs - the historical voyages of discovery made in the centuries following the Renaissance - were completed in considerably less time than SETI has been beating the cosmic bushes. Columbus spent five weeks finding North America (and he wasn't even looking). Captain Cook, a true paragon of explorers, and a man who mapped places that Europeans didn't even know were places, never mounted an expedition that lasted more than three years.

But those analogs are false. The South Pacific, for all its watery wastes, is comprehensible in size. Even Cook's unimpressive Whitby collier, powered by sailcloth, could cross the Pacific in a matter of months, come about, and cross again in a different direction. His quarry, the islands peppering the ocean like coins scattered onto a living room carpet, signaled their presence by clots of clouds even when the islands themselves were below the horizon.

The SETI wilderness is incomparably larger, obviously, and its quarry is cryptic. Even if there are ten thousand transmitting societies nestled in the arms of the Milky Way, we might need to search millions of star systems before we find one. The actual number of star systems that radio SETI experiments have carefully examined is fewer than a thousand.

It's a simple truth, although one not universally acknowledged, that SETI is still in its early stages. Consequently, many of its practitioners will tell you that this is a multigenerational experiment, akin to building cathedrals in medieval Europe. In other words, a lot of SETI scientists will answer the question that began this article by saying "not in my lifetime, nor in that of my children or grandchildren."

Fighting words, but could they be hyperbolic? To begin with, SETI experiments will have examined millions of star systems within a generation. And within two, we could carefully check every star in the Galaxy. The SETI ship has a lot of ocean to cover, but thanks to new technologies, it's picking up speed. So clearly, if we haven't found something by mid-century or so, it will be hard to argue that it's still "early stages."

And frankly, it's conceivable that SETI's basic assumptions might be proven wrong. Imagine that the new space-based telescopes (COROT and Kepler) currently being deployed to hunt for Earth-size planets around other stars come up empty. That would be a premium-grade bummer. But even if (as widely expected) they do discover rocky worlds, it's possible that a decade or so down the line, their telescopic successors - atmosphere-sniffing instruments such as the Terrestrial Planet Finder - might fail to find any extrasolar worlds on which life has taken hold.

Spacecraft of the future might return to us the news that neither Mars, Europa, nor any of the other orbs of the solar system with liquid water have ever produced a microbe. If these are headlines of the future - if the local cosmic neighborhood turns out to be as sterile as prime-time television - then that would certainly put me on the defensive.

But the fact is that none of this incites me to break out the worry beads. Not yet. The various factors in the well-known Drake Equation, which is often used to estimate the chances of SETI success, have - at least until now - become more encouraging with time, not less. The more we learn about the universe, the more it seems disposed to house worlds with life. It didn't have to be that way.

Somewhat more disquieting is the possibility that our approach is wrong. SETI today is overwhelmingly a search for narrow-band electromagnetic transmissions, or in fewer syllables, a hunt for beamed radio or light. We search with straightforward telescopic techniques, but it's possible that alien broadcasts could be encoded in ways that we're not set up to find. I'm not talking about how they construct their messages - or whether they're broadcasting in Standard American English or a lilting Klingon dialect - but the technical scheme they use. For instance, Walt Simmons at the University of Hawaii has suggested that garrulous aliens might wield two widely separated transmitters and use quantum mechanical effects to encode their messages. The advantage would be that if we opened this type of alien mail, it would be impossible to tell from which direction it came, thereby protecting the anonymity of the sender. This sort of approach - still somewhat beyond our technical abilities - might make our present receiving schemes seem naive.

In addition, there's always the chance that the discovery of new physics will reveal some communication mode that's either faster than light and radio, or requires less energy to use. This doesn't seem likely, but science is all about surprises.

Indeed, my personal feeling is that if SETI hasn't turned up something by the second half of this century, we should reconsider our search strategy, rather than assume that we've failed because there is nothing - or no one - to find. Would I ever conclude that we've searched enough? Would I ever truly give up on SETI's bedrock premise, and tell myself that the extraterrestrials simply aren't out there? Not likely. That would be to assume that we've learned all there is to know about our universe, a stance that is contrary to the spirit of explorers and scientists alike. We might yearn, or even need to believe that we are special, but to conclude that Homo sapiens is the best the cosmos has to offer is egregious self-adulation.

This editorial first appeared on Space.com*, and is used here by the kind permission of the author.* ❖

Editorial:

What Hath God Wrought?

by H. Paul Shuch, Executive Director Emeritus, The SETI League, Inc.

Morse, the digital communications code first demonstrated to a waiting world by Samuel F.B. Morse in 1844, is now officially obsolete. And so, I imagine, are many of us who still employ it.

First used to cross continents, and then (half a century later) to cross oceans, Morse Code (and its successors) wrought the communications revolution, shrinking and linking our globe, and ultimately facilitating collaborative science, as is practiced by The SETI League. For the past century, it has been the primary means by which amateur radio operators (to which fraternity many SETI League members belong) communicated with their counterparts in distant lands.

Ah, but no more. Several years ago, the International Telecommunications Union deemed Morse Code skills optional. Prior to that time, member states issuing ham radio licenses were required to compel applicants to demonstrate proficiency in that archaic artform. When the Morse Code requirement was abandoned by the ITU, individual nations were free to drop the code test from their licensing procedures. Many did -- but not the United States, the tail that wags the telecom dog.

But, in 2006, the USA's Federal Communications Commission dropped the other dit, and subtracted Morse proficiency from the price of admission into the ham radio fraternity. The resulting controversy pitted US against THEM, with US being those already skilled in this particular digital communications mode, and THEM being those who preferred more modern means of sharing ones and zeroes.

What has all this to do with SETI? On the surface, it would seem to involve us only peripherally. Many (but certainly not all) SETI League members happen to be licensed by our respective governments to engage in amateur radio communications. The grass-roots SETI League is an amateur as well as a professional organization. And our Search certainly involves electromagnetic communications. So, by syllogism, Morse Code proficiency is relevant to at least some engaged in the SETI endeavor.

In a broader sense, it can be argued, Morse Code is irrelevant to the theory or practice of SETI. For, in the Search phase, we are operating our telescopes as sensitive interstellar *receivers*, trying to detect radio or optical evidence of our cosmic companions. Unless we choose to transmit (and, in fact, *even* if we choose to transmit), any skills in radio telegraphy are entirely secondary to our stated mission. So, who cares what the ITU, the FCC, or any other regulating body may dictate?

On the third hand (and there's no telling how many hands ETI might possess), it is reasonable to assume that, with the elimination of a Morse Code requirement, the barriers to entry into the ranks of the radio amateurs have been reduced. Whether you are a Morsophile or a Morsophobe, you will have to admit that this could result in the world coining more licensed hams. And since The SETI League draws its membership base, at least in part, from among the ranks of the world's radio amateurs, might this not result in more potential SETI League members? I think this is at least an arguable conclusion.

In which case, I thank you, Mr. ITU (and you, Ms. FCC), for opening the doors to greater SETI participation. Here we have a chance to attract wider participation in the SETI enterprise. This can have nothing but positive results.

Unless ETI chooses to communicate solely in Morse Code.

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 Director Introduces New Astrobiology Course

Williamsport PA.., February 2007 -- In his capacity as Visiting Professor of Physics and Astronomy at Lycoming College, Dr. H. Paul Shuch, The SETI League's executive director emeritus, is pleased to introduce "Life in the Universe," a new undergraduate course that explores the origin, development, and distribution of life in the cosmos. The four semester hour class, which includes lecture and laboratory components, was approved by Lycoming College as an Experimental Course and scheduled for the Spring, 2007 semester, which began on January 8th. A total of 55 students, divided into three laboratory sections, are currently enrolled.

The first scientific life-in-the-universe conference was held at the National Radio Astronomy Observatory, Green Bank WV, in 1961. For about four decades now, conferences touching on the topics of this course have been sponsored periodically by the International Astronomical Union, and under the auspices of the International Academy of Astronautics. In the past, these meetings fell under the heading of "Bioastronomy." "Astrobiology" is merely NASA's latest buzz-word for this ongoing research. Nevertheless, as an academic discipline, astrobiology is only recently arrived on the scene. Few colleges or universities currently offer astrobiology courses - and still fewer at the undergraduate level. Thus, students can envision themselves as standing on the pier, looking out across largely uncharted waters. Prof. Shuch's course is intended to bring order and understanding to the regions where once there be only dragons.

Founded in 1812, Lycoming College is a small, church-affiliated liberal arts and sciences institution, boasting 1500 students, 100 faculty members, small classes, and highly interdisciplinary education. Among its variety of undergraduate programs offered are BA and BS degrees in both Astronomy and Physics. The Lycoming campus is located in downtown Williamsport PA, a small community of 30,000 which calls itself a "college town." In addition to Lycoming College, Williamsport is home to the Pennsylvania College of Technology, a Penn State University affiliate where Prof. Shuch taught for several years before joining the SETI League as Executive Director in 1995. ❖

Ask Dr. SETI:
Do You Support Active SETI?

Dear Dr. SETI:

The SETI League's animated logo, on your website, appears to implicitly endorse the idea of an Active Search for Extraterrestrial Intelligence. I thought The SETI League only supported Passive Searching. Are you now endorsing Active SETI?

Miguel, Venezuela

The Doctor Responds:

Thank you for noticing our logo, Miguel. Please take a closer look at that animated GIF. You will see that the direction of wave motion is inward, toward the antenna. Thus, it depicts a distant message being *received*, not one being transmitted from Earth.

In its original form, as first drawn in 1994 (the year The SETI League was founded), our logo was of course static. Thus, there was no way to tell that the logo *didn't* represent a transmission from Earth. Because our respected colleagues at the SETI Institute are indeed committed primarily to passive SETI, one of their scientists politely declined to join The SETI League until we clarified our logo. I am pleased to report that once we produced the animated version, clearly depicting reception, she became a SETI League member and ardent supporter.

It is true that The SETI League's primary research project is indeed a passive all-sky survey. Nevertheless, The SETI League is certainly open to the possibility of Active SETI experiments, as long as they are within the guidelines of internationally adopted protocols. Please see the Protocols section of the website of the SETI Permanent Study Group, International Academy of Astronautics, at http://iaaseti.org, for further clarification on this controversial issue.

Dish Mesh Spacing

Dear Dr. SETI:

In your column on parabolic reflector surface accuracy, you state, "The surface inaccuracies should not exceed a tenth of a wavelength at the operating frequency." I agree with this, but I am looking for some reference that will allow me to calculate what will happen to the dish efficiency if I use only a 1/4 or 1/2 wavelength mesh surface. Can you help?

Jim, Michigan

The Doctor Responds:

Here's a rough rule of thumb, Jim: A solid surface reflects 100% (minus feed blockage and illumination spill-over, of course) of the incident signal. That is, it is completely opaque. At half-wavelength mesh spacing, the dish surface becomes 100% porous -- that is, it reflects *none* of the incident signal. So, for quarter wave spacing (midway between solid dish and half-wave mesh), it stands to reason that the dish should be 50% porous, reflecting half of the signal and passing the other half.

This may sound like only a 3 dB penalty for going to 1/4 wave mesh, but it's actually much worse than it sounds. This is because, in addition to losing half the signal, when you are pointing your dish straight up (toward quiet sky), you end up filling your feedhorn 50% with warm Earth (290 Kelvin), which it sees looking down *through* the dish. This would raise your system noise temperature by an extra 155 Kelvin (half of the Earth temperature, because the quarter-wave mesh is half porous, remember?) The resulting thermal noise takes (for example) an otherwise 50 Kelvin receiver up to 205 K. The net penalty is thus: 3 dB reduction in antenna gain, *plus* an additional 6 dB in receiver noise, for a total signal-to-noise degradation of a shocking **9 dB!!** This is like reducing your parabolic reflector's diameter by a factor of three, which I think you can agree won't do much for the sensitivity of your radio telescope.

Bottom line: quarter wave mesh just won't work. A reasonable compromise is to use eighth wave mesh, which degrades your overall system only about 1 dB, relative to a solid dish. ❖

SARA Announces Keynote Speaker

Little Ferry, NJ.., March 2007 -- The Society of Amateur Radio Astronomers (SARA), a SETI League Affiliated Society that represents several hundred amateur radio astronomers around the world, is pleased to announce the selection of Dr. Andrew Clegg (W4JE), a radio astronomer with interests in amateur radio, astronomy, and photography, as Keynote Speaker for its annual technical conference, scheduled for 1 - 3 July 2007 at the National Radio Astronomy Observatory, Green Bank, WV.

Dr. Clegg received his M.S. and PhD degrees in radio astronomy and electrical engineering from Cornell University, and his BA degree in physics and astronomy from the University of Virginia. He first worked as a research scientist with the Naval Research Laboratory in Washington, D.C., where he studied astrophysical masers, interstellar radio wave propagation, and the Galactic magnetic field. He also developed new algorithms for fusing data from diverse sensors (ranging from microwave to ultraviolet) that were used in remote sensing applications. He then worked in private industry as an RF engineer for Comsearch (a consulting firm), then as Lead Member of Technical Staff for Cingular Wireless, the nation's largest wireless provider. He re-joined the Federal government in 2003, where he served as the National Science Foundation's Program Manager for the National Radio Astronomy Observatory. Presently, he is Program Director for Electromagnetic Spectrum Management at NSF, where he spends most of his time trying to protect the frequency allocations used by the radio astronomy service from growing radio interference. He presently uses his adult occupation to fund his long-time hobbies -- he has been an amateur astronomer since age 10 and an amateur radio operator since age 14.

Dr. Clegg's keynote presentation, tentatively scheduled for 10 AM on Monday, 2 July 2007, is titled Present and Future Radio Spectrum Trends: their impact on radio astronomy. He says, "I spend a lot of my time doing spectrum management on behalf of NSF's radio observatories. Many of the same topics that impact the big observatories (such as Broadband over Power Line (BPL), ultrawideband emitters, unlicensed devices, satellites, the DTV transition) will also impact amateur radio astronomers." ❖

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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 2006 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
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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
Tune In The Universe! (CD-ROM)	$25	$30
Proceedings of SETICon01	$20	$25
Proceedings of SETICon02	$20	$25
Proceedings of SETICon03 (CD)	$15	$20
Proceedings of EuroSETI04 (CD)	$15	$20
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SARA 2006 Conference Proceedings	$20	$25
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Sing a Song of SETI (Songbook)	$10	$13
Sing More Songs of SETI (Songbook)	$10	$13
T-shirts, specify M, L, or XL	$15	$18
SETI Nerd Gift Set (one each Mouse Pad, Pocket Protector, *Project Cyclops* and *Tech Manual*) at 20% Savings to Members Only:	$30	$40

*** Includes postage to (u) US, or (o) other addresses.**

Payments in US Dollars, check payable through a US bank

Pleased to Accept Credit Cards

The SETI League invites you to pay your membership dues and additional contributions via Visa or MasterCard. Please fill out the form below and return it with any order. We thank you for your ongoing support.

Circle One: Visa / MasterCard Exp.___/_____
Card Number:_____

Cardholder: _____
Address: _____
Phone: _____ email:_____

Ham call: _____ URL:_____
Total Contribution (US Dollars):_____
Signature:_____
Today's date:_____