

# DR. SETI'S STARSHIP

Searching For The Ultimate DX

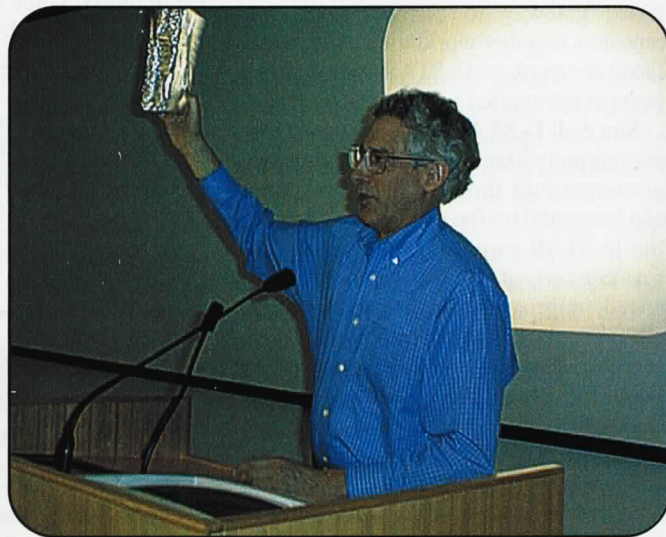
## Betting on SETI Success

If I were a betting man (I am) and had money to put down on the table (I don't), I'd wager that our first encounter with alien intelligence will be via interstellar microwave contact. Perhaps that's because of my ham radio background. It just stands to reason that photons are not only the fastest spaceship in the universe, but also the cheapest. Microwave photons (the substance of electromagnetic communications) are both massless and relatively energetic. They traverse the interstellar medium at the fastest speed that Einstein would allow, relatively unimpeded, while carrying information from point A to point B. For practical purposes, the power requirement for transiting the interstellar gulf can be measured in kilowatts.

Contrast this with interstellar flight, our most likely alternative search strategy. Fermions (the stuff of which we, and our machines, are made) have mass, and both Newton and Einstein agree that accelerating mass to great velocity requires great energy. Thus, sending a cosmic message in a physical bottle will require not kilowatts, but billions of Terawatts of energy. No advanced technology that I can imagine is capable of overcoming this barrier. As Mr. Scott (my favorite engineer) told Kirk in *Star Trek*, "Captain, I canna' change the laws of nature."

Allen Tough believes otherwise. You have met Prof. Tough previously in these columns. He's the futurist from the University of Toronto who founded Invitation to ETI (extraterrestrial intelligence), the web-based project designed to stimulate dialog between us and our cosmic companions. Allen envisions an advanced nano-robotic technology that will permit low-cost, possibly self-replicating, autonomous interstellar probes. Based upon the undisputable fact that humanity is well on its way to developing such technology, Allen reasons that a more advanced civilization by now will have launched a fleet of such miniature robot probes, some of which may already have reached our solar system. It is with these probes, rather than their creators, that Allen is betting we will first communicate.

Allen Tough and I have long debated whether it is interstellar photons, or interstellar probes, that will give us our first taste of interstellar contact. Now comes Long Bets ([www.longbets.org](http://www.longbets.org)), the Arena for Accountable Predictions, a web-based wagering facility launched by the futures-oriented Long Now Foundation. The purpose of Long Bets is to improve long-term thinking. Long Bets is a public arena for enjoyably competitive predictions, of interest to society, with philanthropic money at stake. The Long Now Foundation furnishes the continuity to see even the longest bets through to public resolution. Its website provides a forum for discussion about what may be learned from the bets and their eventual outcomes. Allen threw down the gauntlet at Long Bets, and I picked it up. His prediction: "Evidence of extraterrestrial



*It may indeed look like a tissue box covered with aluminum foil, but the object Allen Tough is holding up, he assures us, is a prototype interstellar robotic nano-probe.*

intelligence within the solar system will be confirmed before evidence from several light-years away."

Even though I personally disagree, there is some logic behind Allen's prediction. Here is his rationale:

Most SETI scientists agree that any ETI we detect will likely be thousands or millions of years ahead of us (because our sun and our science are so young). Such an advanced society will likely have the *capacity* to build and launch cheap, smart autonomous probes to explore the galaxy. This statement is supported by our recent theoretical and engineering advances in robotics (Ray Kurzweil, Hans Moravec), molecular manufacturing (nanotechnology), and interstellar propulsion (beam propulsion and even more radical possibilities). Also, an advanced society will likely be *motivated* to send out exploratory probes, judging by our own society, which sends spacecraft to explore everything within reach.

If such a probe were sent a few centuries ago to explore Earth, it would likely be here by now. We might stumble on it somewhere on Earth by accident. Or we might find it through the ongoing monitoring carried on by scientists, security and intelligence agencies, and the military. Or one report in the flood of UFO and abduction reports might turn out to be a genuine alien. Or one of our space exploration programs might find some alien artifact somewhere in the solar system. Or ETI might reply to the Invitation to ETI issued by 100 scientists, artists, and others at <http://www.ieti.org>. (As the founder and Chief Scientist of this innovative SETI project, I am naturally optimistic about its chances of success.)

I've gone on record as betting against my respected colleague, not because I think Allen is wrong about interstellar probes, but

\*Executive Director Emeritus, The SETI League, Inc.,  
<[www.setileague.org](http://www.setileague.org)>  
e-mail: <[n6tx@setileague.org](mailto:n6tx@setileague.org)>

because we don't yet know how to detect them. It's a matter of instrumentation. Although we've gotten very good at intercepting electromagnetic waves, our record for detecting even nearby natural space debris is not too stellar (pun completely intentional).

Although I do not at all question the likely existence of interstellar probes within our solar system, I consider interstellar electromagnetic (EM) leakage (or, if we are extremely fortunate, deliberate radio or optical beacons) much easier to detect with our present level of technology. Thus, selectivity factors in the instrumentation favor detection of interstellar EM artifacts first. (As our techniques improve, the odds of detection will ultimately shift. Therefore, I guess by betting on interstellar EM signals, I'm siding with those who believe contact will occur in the short term.)

Allen has argued (most convincingly, I might add) that any super-smart alien robot that is sophisticated enough to come here will be quite capable of initiating contact, or even of responding to our joint invitation at <http://ieti.org>. Although I certainly hope this is the case, it does put us in the role of passive communications partners, waiting for ETI to take the first step. Being no wallflower, I personally advocate a more proactive approach, preferring to put our eventual entry into the galactic community squarely in the hands of humanity. Assuming the existence of extraterrestrial intelligence (without it, this bet can neither be won nor lost), traditional interstellar SETI makes us solely responsible for the success or failure of our efforts. Should ETI decide to step in and shortcut the process, I for one will be delighted at the contact, although dismayed that my friend Allen will end up winning this bet!

Prof. Tough and I each have put a couple of hundred dollars on the line with Long Bets. The rules of Long Bets specify that once a bet is settled, it is a designated charity, rather than the parties to a wager, that will receive the funds on deposit. Allen has generously stated that if he prevails in his bet, the winnings will be contributed to the nonprofit SETI League, a ham radio organization near and dear to my heart. In putting up money against him, I too have designated that worthy grassroots organization as recipient of any funds, once the bet is settled. That way, either way, this will be a no-lose bet!

73, Paul, N6TX

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