

The Eerie Silence: Renewing Our Search for Alien Intelligence

By Paul Davies

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One of the world's leading scientists explains why—and how—the search for intelligent life beyond Earth should be expanded.

Fifty years ago, a young astronomer named Frank Drake first pointed a radio telescope at nearby stars in the hope of picking up a signal from an alien civilization. Thus began one of the boldest scientific projects in history, the Search for Extraterrestrial Intelligence (SETI). After a half-century of scanning the skies, however, astronomers have little to report but an eerie silence—eerie because many scientists are convinced that the universe is teeming with life. Physicist and astrobiologist Paul Davies has been closely involved with SETI for three decades and chairs the SETI Post-Detection Taskgroup, charged with deciding what to do if we're suddenly confronted with evidence of alien intelligence. He believes the search so far has fallen into an anthropocentric trap—assuming that an alien species will look, think, and behave much like us. In this provocative book Davies refocuses the search, challenging existing ideas of what form an alien intelligence might take, how it might try to communicate with us, and how we should respond if it does.

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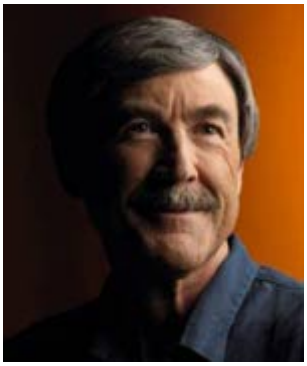
Editorial Review

Amazon.com Review
Product Description
Are we alone in the universe? This is surely one of the biggest questions of human existence, yet it remains frustratingly unanswered. In this provocative book, one of the world's leading scientists explains why the search for intelligent life beyond Earth should be expanded, and how it can be done.

Fifty years ago, a young astronomer named Frank Drake first pointed a radio telescope at nearby stars in the hope of picking up a signal from an alien civilization. Thus began one of the boldest scientific projects in history, the Search for Extraterrestrial Intelligence (SETI).
After a half-century of scanning the skies, however, astronomers have little to report but an eerie silence--eerie because many scientists are convinced that the universe is teeming with life. Could it be, wonders physicist and astrobiologist Paul Davies, that we've been looking in the wrong place, at the wrong time, and in the wrong way?
Davies has been closely involved with SETI for three decades, and chairs the SETI Post-Detection Taskgroup, charged with deciding what to do if we're suddenly confronted with evidence of alien intelligence. He believes the search so far has fallen into an anthropocentric trap--assuming that an alien species will look, think, and behave much like us. In this mind-expanding book he refocuses the search, challenging existing ideas of what form an alien intelligence might take, how it might try to communicate with us, and how we should respond if it does.
The Eerie Silence provides a penetrating assessment of the evidence, past and present, and an exciting new road map for the future.

A Q&A with Paul Davies, Author of *The Eerie Silence*

Q: Why is the search for aliens so popular right now?



A: SETI is 50 years old this year. It was in 1960 that the astronomer Frank Drake (to whom I dedicate the book) took up the challenge and started sweeping the skies with a radio telescope in the hope of picking up a signal from an alien civilization. Whether the anniversary is the trigger, or whether it is simply that the study of extraterrestrial life is an idea whose time has come, the last few months have witnessed a surge of media and scientific interest, in astrobiology in general, and SETI in particular. For example, I am involved in at least five separate television series on ET. I have also attended SETI meetings in The Vatican, at Britain's premier scientific academy, The Royal Society, and at more than one major NASA congress. Gone are the days when scientists pooh-poohed the whole idea. In fact, I would go so far as to say that the pendulum has swung too far the other way, so that many scientists and commentators are overly credulous about the

prospect for intelligent aliens. Statements like "the galaxy is teeming with life, and intelligent life must surely have arisen somewhere" routinely trip off the tongue of many a scientific spokesman, without the slightest hard scientific evidence in favor of it. I hope they are right, but there are important issues that get glossed over--issues that I engage in the book.

I have written both a celebration and a critique of SETI. The title gives away the principal result: so far, so bad. Not a whisper of an alien message has been received (although there are some intriguing mystery signals). But the word "eerie" is a teaser, because I for one don't accept no as an answer. Nor do the SETI folk at the sharp end of the research--the astronomers who patiently sit at the controls of the radio telescopes with the champagne waiting on ice. They argue that they have searched only a tiny fraction of target stars so far, and they look forward to a spanking new system called the Allen Telescope Array that will greatly expand their reach. Nevertheless, traditional radio SETI is a needle-in-a-haystack search with no guarantee that a needle even exists.

Q: What's wrong with existing SETI?

A: A fundamental flaw lies at the core of most existing SETI strategies. Carl Sagan popularized the appealing idea that an altruistic alien community might be obligingly beaming radio messages at us, perhaps carefully crafted to give mankind a welcome technological and sociological fillip. But that scenario will no longer wash. Even SETI optimists concede that a radio-savvy civilization within a few hundred light years is extremely unlikely (and systematic searches have spotted nothing). Suppose there is an alien community 1,000 light years away. That is still in our galactic neighborhood--the Milky Way is some 100,000 light years across. The aliens belonging to this putative community cannot know of our existence--they cannot know that Earth has radio technology and the means to detect their signals. The reason concerns the finite speed of light. At 1,000 light years away, the aliens see Earth today as it was 1,000 years ago. Because nothing can go faster than light (it is a basic law of physics), there is no way they can know about the industrial revolution and terrestrial radio telescopes. So why would they have started beaming messages to us 1,000 years ago, when their view of Earth at that time would have been the year A.D. 10? They might detect signs of agriculture and large scale building (such as the pyramids), and they may of course surmise that some millennium soon humans would develop radio technology. But it would make no sense for them to start transmitting powerful and expensive radio messages at us until they know we are on the air. When will that be? In about 900 years time, when our first feeble radio transmissions, leaking into space at the speed of light, finally reach them.

I do not oppose traditional SETI. The astronomers are doing a great job, and they have refined their techniques splendidly. The Allen Telescope Array currently under construction will help a lot. They have my full backing. But their methodology is well adapted to searching for narrow-band (sharp frequency) continuous signals. They stick to this because they have built up a lot of expertise in that area and that is what their financial backers are paying them to do. Their systems are less well adapted, however, to what I regard as the more promising approach to radio SETI, which is to look for beacons, for example, towards the center of the galaxy, where the oldest and wealthiest civilizations are likely to be located. The problem about detecting a beacon is that it would show up as just "something that went bleep in the night," and may not recur for months or even years. You'd have to stare at the same patch of sky for a very long time. SETI is not geared to that kind of observation and is not funded to do it. But the huge advantage of beacons as opposed to directed narrow-band signals is that the beacon-builders need have no knowledge of our existence. A beacon is made for general consumption, and serves only as a beckoning signal; it is not a message deliberately aimed at us. So the chances of finding a beacon are much higher.

Q: How can we do better?

A: My book advocates a massive expansion in SETI, not by doing more of the same (though that is good too) but by shifting the focus toward the search for general signatures of intelligence. All technology leaves a footprint; for example, human technology is producing global warming. Alien technology might leave a bigger footprint, with telltale signs. However, these signs might be very subtle and require our best scientific analysis to detect. Discovery in science favors the prepared mind, so this book is a wake-up call to all

scientists to start thinking about how a signature of alien technology might impact on their field of research. I'm also hinting that a signature of alien technology might already lurk in an unexplored database in fields as diverse as astrophysics, geology and microbiology.

One thing I decided to do in the book was to tackle the thorny issue of alien visitation--what the physicist Enrico Fermi alluded to in his famous "Where is everybody?" quip six decades ago. However--and this is crucial--I want to draw a big distinction between stories of ET visiting Earth in historical times, abducting people, re-engineering humans, being drawn on cave walls and so on, and what I regard as legitimate speculation, namely, that some time in its four billion plus year history, the solar system may have been visited or passed through by an expedition or colonization wave. It need not have been alien beings in the flesh, but their robotic surrogates. Anyway, the point is that the time scale is vast--they could have come at any time in 4.5 billion years! Let's be optimistic and suppose it happened a mere 100 million years ago. Would we know? Would any traces of alien technology survive for 100 million years? Not the plastic cups and rocket parts, I think. It turns out that there are some possibilities, though. Nuclear waste is one, genomic detritus is another. We could look for these things. It wouldn't cost much, and who knows what we might find?

Q: Are there any new scientific ideas unveiled in this book?

A: Yes! SETI is predicated on the belief that life arises quickly and easily on earthlike planets, an idea sometimes called the cosmic imperative (after Christian de Duve, the biologist who coined the term). Astronomers think there are billions of earthlike planets in our galaxy alone, so if the cosmic imperative is correct, there is a good chance of finding intelligent aliens out there. But how do we know the likelihood that life will arise quickly and easily? Suppose life is a freak phenomenon, the outcome of an incredibly unlikely chemical fluke, unique in the observable universe? Then we will indeed be alone. That view was the prevailing opinion when SETI began 50 years ago, and is still widely held by biologists.

One way to test the all-important cosmic imperative idea is to look for a second sample of life on Earth. If life does form readily in earthlike conditions then perhaps its started many times right here on our home planet. Amazingly, nobody has thought to look until recently. I've been developing a research theme at Arizona State University evocatively called the shadow biosphere. That's not my term--it was introduced by Shelly Copley and Carol Cleland at the University of Colorado. Basically, we are devising strategies to find life on Earth, but not as we know it. Looking for a radically different form of life is restricted to microbes, and it consists of making guesses for how life might be done differently, and then looking to see whether it's out there in the environment. We have a lot of ideas, and I'm happy to say that some of them are being funded. If we find that there are two forms of life on Earth (more would be better), then we can be pretty certain that life will pop up on most earthlike planets around the universe. It would be too much of a stretch for it to have formed more than once on one earthlike planet but never on all the others.

Q: Do you dismiss all the UFO stories?

A: I am not casually dismissive of the UFO stories. Most reports are not made by crackpots or liars, but by people who have had a genuinely puzzling or frightening experience. I have studied the subject very closely over many years. My conclusion is that although the experiences are real enough (in the minds of the witnesses at least), they have nothing to do with alien intelligence. There is no reason that aliens should be visiting Earth now, as opposed to at any other time over the last few billion years, and none of the stories I hear about today differ much from those I personally investigated 40 years ago. Ufology is stuck in a rut too!

Q: What is the SETI Post-Detection Taskgroup?

A: It was set up by the International Academy of Astronautics (IAA), and I am the current chair. It consists of about 20 journalists and scientists, two lawyers and a priest. Our job is to reflect on the implications for society as a whole should we suddenly obtain incontrovertible evidence that we are not alone. Obviously our deliberations are highly hypothetical. Also, we have no teeth--we are an advisory body only. Nevertheless, it makes sense to think through some of the issues ahead of time, so humanity is not caught on the hop. The sort of things we worry about is how to ensure that the scientists who make the discovery can retain control over events for long enough for its significance to be properly evaluated, how we can prevent half-baked

attempts by individuals to get in on the act, or even to start transmitting self-styled messages off their own bat, which organizations should be informed and in what order. I like to tell people at those proverbial dinner parties that if ET calls on my watch, I should be among the first to know!

(Photo © Dave Tevis/Tevis Photographic)

From Publishers Weekly
In what has become known as Fermi's Paradox, the great nuclear physicist Enrico Fermi once asked, if there are aliens out there, where is everybody? After 50 years of looking, the SETI (Search for Extraterrestrial Intelligence) project has likewise failed to find anybody. Cosmologist Davies (*The Mind of God*), winner of the 1995 Templeton Prize, believes that SETI's search for narrow-band radio signals from planets around other stars needs to be broadened to look for other possible signs of life. Aliens may be using far more advanced technology than radio to signal the cosmos, such as manipulating pulsars to act as beacons or even neutrino signaling. Davies also puts forth the possibility that alien probes may be silently trolling the solar system. The author surveys popular topics in science fiction such as Dyson spheres, time travel, and wormholes, and decides that they're not feasible under physics as we understand it. He concludes with a far-ranging look at what might happen here on Earth when we make first contact. Highly recommended for both science fiction and astronomy buffs. Illus. *(Apr. 13)*
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Review

"Highly recommended for both science fiction and astronomy buffs."—*Publisher's Weekly*

"All readers interested in astrobiology, SETI, and extraterrestrial life will benefit from this book."
—*Library Journal*

"After half a century of fruitless searching, SETI needs a summing up. This book does the job—you need no other. Davies ranks among our very best science writers, and this book should prompt deep rethinking among the entire SETI community."—Gregory Benford, author of *Timescape*

"Paul Davies has written a most delightful book, perhaps the most thoughtful, thorough, and comprehensive book ever published on the key question: are we alone in the universe? Davies addresses one of the most pivotal questions facing humanity, and does it with wit, style, and rigor. *The Eerie Silence* will satisfy the curiosity of anyone interested in big cosmic questions about intelligence in the universe." —Michio Kaku, professor of theoretical physics and author of *Physics of the Impossible, Hyperspace, and Parallel Worlds*

"Paul Davies gives us a panoramic view of the quickening search for cosmic company—a fascinating tale stuffed with novel ideas about the nature of intelligence far beyond our own."—Seth Shostak, Senior Astronomer, SETI Institute

"Are we looking for life in all the wrong places? This is the deep scientific question that inspires Paul Davies' *The Eerie Silence*. With clarity and passion, Davies not only brings you up to speed on the cutting-edge perspective, he also presents his own preferred strategies for making contact. Within may be found some scenarios that even the sci-fi writers haven't tumbled on yet. A feast for thought about the most fascinating mystery of all." —Ann Druyan, creative director, NASA's Voyager Interstellar Message, and co-

creator, with Carl Sagan, of *Contact*

"Paul Davies imagines the unimaginable. After fifty years in which radio astronomers have listened in vain for voices from a silent sky, with clarity and authority Davies sets out a stunning new prospectus for the continuing search for intelligence beyond the Earth. A must-read for anybody fascinated by the most profound of questions: are we alone?"—Stephen Baxter, author of *Manifold: Time and Flood*

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