Preface

The "Wow!" signal was detected in 1977 during Ohio State University's long-running search for radio signals from the stars, and is one of the best candidates for a signal from extraterrestrial intelligence ever seen. I read about it several years later and called the Ohio State researchers to learn more. I was surprised to find that no other astronomers had followed up on the intriguing signal, since if confirmed it could lead to discovering ET, but things that go bump in the night without appearing repeatedly are easy to dismiss as local interference—and they usually are. Few astronomers elsewhere had the right gear to search for the signal even if they had been interested.

I visited the giant Ohio radio telescope and learned about its search for radio signals from the stars—the only full-time search anywhere at that time. The evidence for the Wow being a signal from a celestial source seemed very good. The rise and fall of the signal's strength over the period of about a minute looked almost exactly like the signature of the antenna's beam sweeping over a celestial radio source, rather than local interference, and it seemed unlikely that an aircraft or satellite would mimic that special signature. But unlike natural radio sources that hiss across wide bands of the radio spectrum, the signal was narrow, like radio signals usually are, concentrated in one channel out of the 50 frequency channels being monitored. And, unlike

most natural sources, it seemed intermittent—there for a minute, then gone; not seen when a second beam swept past the same spot.

The Wow is intriguing because it had many characteristics expected of a radio signal from the stars, and it was the best candidate that the Ohio search found during their long-running search covering more than half of the sky. It seemed possible that the Ohio scientists had glimpsed a broadcast from another world, although they could not confirm it because their telescope could see that spot in the sky for only a few minutes each day.

I decided to hunt the Wow, despite the awkward fact that I'm not an astronomer. Since then, I've searched for it with a small home-brewed radio telescope, with the sophisticated Harvard-Smithsonian META radio telescope, with the Very Large Array—one of the world's most powerful radio eyes on the universe—and with the Hobart radio telescope in Tasmania in the Southern Hemisphere. The signal *has* proven elusive…

It's possible that it was just interference from a man-made gizmo like a satellite, but there are many reasons to think that it may have been a real signal from the stars, perhaps something like a lighthouse that shines our way periodically. All efforts to find it so far amount to only about one day of listening at any one spot, so it's possible an intermittent signal has been missed.

This book tells the tale of the elusive Wow and my search for it, and it also tells the much broader story of the search for extraterrestrial intelligence, often known as SETI.

Part One of the book focuses on the Wow signal—the Ohio search that found it, what makes it a good candidate, and my quests to confirm it. Hunting the Wow will take us on tours of radio observatories, explain how radio astronomy works, show examples of what searchers see with interstellar radios, and demonstrate how one goes about trying to solve scientific mysteries. I aim to give readers a sense of how it feels to hunt for little green men, showing lots of graphs and illustrations. It might look a bit like a textbook at times, but only the interesting parts, and there's no test. There is no happy ending to the Wow story, yet, but this is how someone might find ET.

I don't claim that aliens have been discovered (we would have to charge a bit more for *that* book), but I do claim that the Wow was a pretty strong tug on the cosmic fishing line. It's possible, however, that it's just a big fish story, a big one that got away, a red herring—so a brief book about SETI is included

at absolutely no extra charge. Some people might want to read the second part first for background on astronomy and on the rationale for searching for signals from other worlds.

Part Two covers the reasons for thinking that planets, life and broadcasters might exist elsewhere, strategies used to search for signs of their presence, what we might find, milestones in the history of searching, and reasons to worry that searching might prove fruitless. The idea of looking for intelligent life elsewhere was pretty speculative before the recent discovery of extrasolar planets. Until then, it was not certain that any other stars *had* planets for life to live on. Now we know that planets orbit many other stars and probably zillions, so life has many possible homes. Whether any other planets actually have life is still a big question; many scientists think it's likely, and robotic explorers in our own solar system could soon send back a picture of a fossil or other evidence that says "Yes!" If life does exist elsewhere, it seems reasonable to think that intelligence might sometimes evolve, and to think that some smart critters would use radio or other technology that we might detect from afar. SETI lets us explore other worlds for intelligent life by listening for signals from the comfort of our own good Earth.

Unlike many writers on these topics, I'm not an astronomer or a journalist. I was trained as an urban planner, and I analyze data for a living—financial, economic, social, and scientific. I've learned enough about astronomy and radio to hunt for broadcasts from the stars, and I'll explain what general readers need to know as we go along. We'll dive deep into a few topics (the most interesting ones) but cover most pretty quickly. We'll also get a few grins poking fun at quirks of science culture, such as awkward acronyms, obscure jargon, and other easy targets.

Some people have the impression that a massive search for ET has been under way for a long time—that *that* is what all those big dish antennas *do*—but not so. During the last few decades, only one or two big antennas have been searching, typically seeing a spot of sky no bigger than the Moon at any moment and not seeing the other 99.999%. Most searches listened on only thin slivers of radio spectrum for a few minutes, and just a few have peeked at the optical spectrum. The sky could be blaring with radio super-stations whose frequency we've not yet tuned, or twinkling with laser beams we've not yet looked carefully enough to spot.

Searching for other beings on other worlds is an exciting opportunity of our time. There may be many New Worlds waiting to be discovered by intercepting radio or light waves rippling through space, just as there were new worlds to be discovered on our own planet by sailing the seas in earlier eras. Signals launched long ago might be raining down on the landscape around us right now, or could appear tomorrow from a previously quiet patch of sky. All we need to do is look up with the right gizmos and we may find that some of the myriad stars are Suns to someone or something—and that some of them might have interesting stories to tell.