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A CONVERSATION WITH ALAN BOSS

Searching for Extraterrestrial Life

By [CLAUDIA DREIFUS](#)

At his day job, Alan Boss of the Carnegie Institution of Washington studies how stars and planets are born. In recent years, he has consulted with scientists for NASA's Kepler space telescope on their mission of finding planets outside our solar system that might be hospitable to life. Mr. Boss, a 58-year-old astronomer and theoretical astrophysicist, was in New York City recently to promote his new book, "The Crowded Universe: the Search for Living Planets," about the scientific hunt for extraterrestrial life. An edited version of a two-hour conversation follows:

Q. ON MARCH 6, A DELTA 2 ROCKET CARRYING THE KEPLER SPACE TELESCOPE WAS LAUNCHED FROM CAPE CANAVERAL. WHAT DID YOU THINK AS YOU WATCHED THE LIFTOFF?

A. Now we're ready to do some science! The big payoff is coming!

Kepler's mission is to detect planets outside our solar system that roughly have the same size, conditions and distance from their stars as [Earth](#). We think the probability of finding extraterrestrial life would be best on Earth-like planets. From previous observations, we know of about 330 "extra-solar" planets. Kepler is likely to send us evidence of hundreds of Earth-like planets revolving around hundreds of Sun-like stars.

Q. YOU ARE A BIG BELIEVER IN "WE ARE NOT ALONE." WHY?

A. From ground-based observations, we know that Earth-like planets are going to be quite common. Estimates are that "earths" probably occur in 10 to 20 percent of the stars. My feeling is that if you have that many earths and you have some prebiotic soup, comets that bring in the organic chemicals that you need to have life, something is going to grow.

You might not always end up with dinosaurs and cavemen, but there are going to be planets out there that will have primitive life. Life on Earth is so vigorous and so able to thrive and fill every niche, how could it not be elsewhere? Give life a few billion years and, under the right conditions, something is going to happen, at the very least some sort of primitive bacteria like what we find in the geysers at Yellowstone.

Q. WHAT'S YOUR RECIPE FOR "PREBIOTIC SOUP"?

A. Proteins, sugars, amino acids, the same sort of things that can be made on the surface of a comet by hitting it with ultraviolet light. Also: water, energy and time. You may want a clay-like surface on the planet, too.

Q. SO YOU ARE NOT AN EARTH CHAUVINIST?

A. Few astronomers are. We understand that we're just a speck of dust in our galaxy in the midst of an incredible universe. As far as we know, the laws of physics work the same everywhere and produce the same conditions.

I don't have any favorite candidates for where we should look for life, though it makes sense to look at nearby stars. There's a good chance that a large fraction will have habitable planets. If you throw the dart, you're sure to hit something. It's not like you have to go to a hundred stars to hit one. If we even hit five good candidates, I think, we'll probably hit two or three places that could support life.

Q. DO YOU THINK IT'S POSSIBLE THAT OTHER LIFE FORMS FROM ELSEWHERE COULD DETECT EARTH'S CIVILIZATION?

A. The military radar leaving our planet is probably the strongest signal from our planet. If others are looking for us, they could pick up the radar.

Now, most of the big ground-based radio telescopes are trying to detect life rather than beam out our presence. In fact, there's an active argument within the extraterrestrial intelligence community as to whether we should be announcing that we're here, instead of just listening quietly. That's associated with worrying about aliens coming to enslave us and kill us. Some people think we should stay quiet.

Q. WHAT DO YOU THINK?

A. That's kind of silly. The speed of light is so fast and distances are so immense between stars that there's zero probability that anybody could come here to invade. Traveling between stars is pretty much the territory of science fiction. With our current best rockets, it would take us 100,000 years to reach the closest star. I wouldn't worry about the interstellar air-raid sirens going off tonight.

Q. ABOUT KEPLER, DID YOU EVER HAVE ANY DOUBTS IT WOULD GET OFF THE GROUND?

A. Oh, sure. One of the themes of my book is about the circuitous route to a launching. [NASA](#) has these mission competitions where 30 or 40 ideas compete against one another for one or two launching slots. The thing is like a horse race where people are throwing rocks and the jockeys are elbowing each other. Scientists can be very competitive. They are not afraid to point out flaws in other people's projects. Kepler got shot down two or three times that way.

The central idea for Kepler was to find Earth-like planets by measuring the decrease in brightness of a star when a planet passes in front of it. The competing scientists kept saying you couldn't measure such a tiny change. But a planetary scientist, Bill Borucki, the main figure behind Kepler, showed that the same device that we use in digital cameras could do the job. In fact, Kepler is just a gigantic digital camera hurtling through space. It's also a much more capable camera than a similar one that the French launched two years earlier, which is designed to do other things.

Always the dark horse in the race, Kepler got its boost when some of the front-running projects were eliminated with Bush administration cuts to NASA. Kepler moved up because it was cheaper and had different sources of financing.

So now, it's up there and before the year is out, we're going to be finding other worlds. This is a great time to be an

astronomer.

Q. I UNDERSTAND YOU HAVE AN ASTEROID NAMED FOR YOU. WHAT'S THAT LIKE?

A. It's not as splendid as one might think. There are something like 400,000 known asteroids, including, Alanboss, Minor Planet, No. 29137. I believe that Eugene and Carolyn Shoemaker found it, and for some reason named it after me. I guess because I was known for work on planet and star formation and they ran out of people to name things after. I've never even seen a picture of my asteroid.

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