



Exobiology *Introduction*

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Artist's impression of the Cassini Orbiter releasing the Huygens lander over Titan. Courtesy NASA/JPL.

The search for extra-terrestrial life has primarily been conducted by interplanetary probes sent to Mars and Venus, such as the Viking and Pathfinder missions, as well as the upcoming Huygens/Cassini mission to Saturn. Another method has been through the SETI Project (the Search for Extra-Terrestrial Intelligence) where telescopes have been used to try and detect signals from other stars.

Even though we don't know whether there is any extra-terrestrial life out there, given a knowledge of an alien environment, it is possible to speculate on what life might look like by extrapolating from what we know about life on Earth.

Related to extra-terrestrial life are certain philosophical and ethical questions; this isn't all science. What happens if we detect alien intelligence? Should we contact them? If so, what should we tell them?

What is exobiology? Exobiology is the study of organisms that originate from outside of Earth. As yet, there has been no conclusive evidence of extra-terrestrial life, so naturally there cannot be much studying going on. However, exobiology also encompasses the search for extra-terrestrial life, and the theoretical study of what life outside Earth might be like.

What are the chances of finding other life in the universe? Why is there any life in the first place? These questions have profound implications, and in *Astrobiology: The Living Universe*, we aim to help you come to your own answers.

Hat Creek Observatory, where the first SERENDIP SETI survey by the University of California, Berkeley, was conducted. Photo courtesy Seth Shostak/SETI Institute.





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Evidence for ET life

Why do we believe that we could find life on other planets? This section discusses the strongest form of evidence we have for life yet - the asteroid ALH84001 from Mars. But did ALH84001 really have any life in it?

Detecting life

Once you have sent an interplanetary probe out and are looking for signs of life, you have to consider what is involved - exactly how can we devise compact yet accurate experiments that will tell us unequivocally if life exists on another planet? It's harder than it sounds.

Finding ET life

Finding extra-terrestrial life is a complicated business, which is why we have devoted an entire section and several separate pages to it. In this section, you will be able to read about how we can detect life, where we should look, what we will do if we find any, how we will communicate with it and why we should look for it in the first place.

Rovers and Landers

Read about why rovers have only now begun to be considered for use on interplanetary missions, and about the different landers that have been used in the past

Satellites

Satellites allow us to look at the surface of a planet in general and survey the entire area rather than just specific parts - and satellites can also help to detect even very small signs of life. In the coming years, the role of satellites will be changing dramatically.

Ethics

If we do ever find extra-terrestrial life, what then? Should we try to communicate, or should we just observe them? We pose the ethical questions involved in finding extra-terrestrial life here

Have ETs found us?

Many people believe that Earth has already been visited by aliens, yet the evidence for this is always very dubious, in the form of blurred photos and second-hand stories. Is it really possible for ETs to have visited us? Astrobiology thinks not

ET life forms

Any extra-terrestrial life we encounter will most likely be microscopic, but if we found large ET life forms they would look very different from those you might see in Star Trek or Babylon 5. Find out why here.

The Selfish Alien

By applying the famous Selfish Gene principle to aliens, we can see that they will not be so alien in their behaviour if not their looks. But how can we know this? Why not read 'The Selfish Alien'...

ETs in Science Fiction

Exactly how plausible are the aliens we see in science fiction stories? Could they truly exist in real life (theoretically, that is) or are they simply products of our imagination?



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Life Islands Theory

The SETI Project has been running for more than 30 years now, but we still have not detected any signals from aliens. The Life Islands theory offers a possible explanation to the question all SETI researchers have asked - Why the silence?

Anthropic Principle

Aside from worrying about whether there is any other life in the universe, many scientists have posed an even more fundamental question - why is there life in the universe at all? The Anthropic Principle could explain why.

Types of Civilizations

Did you know that we are only a Type 0 Civilization? Scientists have defined four different stages of civilization and we are still at the bottom of the ladder. What are the other stages?

Interviews

At Astrobiology, we aim to give you the most up-to-date and accurate information possible - and what better way to do that than to interview the key people involved? Astrobiology talked to the head of SETI@Home, the creator of an alien language, an extra-solar planet finder and the Mars Pathfinder Science Director.