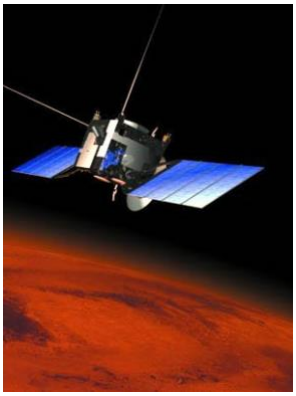


# Life on Mars

Even with the largest telescopes it is very hard to see much detail on Mars. In the late 1800s, some scientists thought they could see straight lines crossing the planet's surface. These lines joined greenish areas that looked as if they were covered by plants. These scientists thought that the straight lines were canals built by Martians to carry water to their crops.

Spacecraft pictures have shown that these canals do not exist. There is no sign of any life – plants or intelligent Martians - on the planet. We now know that Mars is a very cold, dry planet, where liquid water cannot exist on the surface. However, there are large areas of water ice at the polar caps. There is also a lot of ice in the frozen ground – much like the permafrost areas of northern Canada and Russia.

Large, dry channels also show that there was once a lot of running water on the surface. Recent results from Mars Express and other spacecraft show that there may be liquid water deep underground. If Mars was once warmer and wetter, life may have begun on the red planet. Simple life, such as bacteria, may still exist beneath the frozen surface.

In 1996, a group of scientists told the world that they had found evidence of bacteria inside a meteorite that had come from Mars. However, this idea is not very popular with most other scientists. If life is found on Mars in the future, it would be the first proof that we are not alone in the Universe.

# Is There Life on Mars?

By Dr. Marc Rayman

Asked by some of our friends at the Lakeview Museum of Arts and Sciences in Peoria, Illinois.

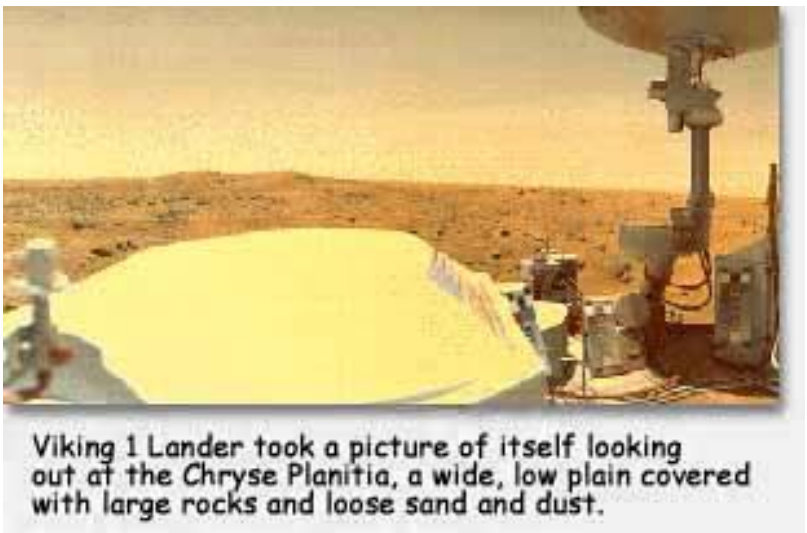
This is an idea that has intrigued people for centuries, and one that I, perhaps like you, have wondered about for most of my own life.

Earth is the only place that we know for certain supports life. Many claims have been made by observers who thought they saw evidence of life on Mars, but we now know they were tricked by the very difficult measurements. From Earth, even with our most powerful telescopes, we just cannot see enough detail on Mars to answer this question. We need a close-up look at the planet.

While robotic spacecraft have given us wonderful views, no humans have ever tried to journey to Mars, and no such missions will be attempted for many years. In fact, whoever will turn out to be the first people on Mars may be your age today, and when you are an adult, perhaps you will watch -- or even participate!-- as people make the first voyage to that planet.

In the meantime, NASA is working hard now to discover whether there is life on Mars. The United States and other countries have been sending spacecraft to orbit or land there since the 1960s, and each mission teaches us more about this fascinating planet. We have learned that even though Mars is more similar to Earth than anywhere else in the solar system, and therefore is a good place to look for life, it is still different from Earth in many ways.

A compass points to the north pole on Earth because our whole planet acts like a giant magnet, but Mars does not act this way. Besides turning a compass needle, Earth's magnetic field turns away dangerous particles of space radiation. Without a magnetic field on Mars and with much, much less air than on Earth, more harmful space radiation reaches its surface. Although some measurements tell us there probably is water on Mars, there is far less than on Earth. And it is so cold there that most of the water is probably not liquid but rather is ice. Overall, Mars would be a pretty uncomfortable place to try to live!



Viking 1 Lander took a picture of itself looking out at the Chryse Planitia, a wide, low plain covered with large rocks and loose sand and dust.

In 1976, NASA landed robotic spacecraft named Viking 1 and Viking 2 on Mars. One of these landers worked there for nearly 4 years and the other lasted more than 6 years. Think of spending that much of your life studying another world! Among their scientific experiments were the only ones so far specifically designed to discover whether there was something tiny (like bacteria) living in the soil.

Viking 1 Lander sampling arm scooped up samples of Martian soil and put them into an instrument that studied them for signs of life. None were found.

Most scientists agree that the results do not reveal any signs of life. The spacecraft had cameras that returned thousands of images of the surface, showing the changing seasons and details of the rocks and dirt near the stationary landers. While not officially part of the life experiments, the cameras did show us that there weren't any large creatures wandering around! Future landers will probe underneath the surface to try to find out if there is anything living below ground.

Many features on Mars seem to have been formed by running water.

But where is the best place to look for life? Although Mars is smaller than Earth, it is still a very, very big place, so where should scientists aim landers to give them the best chance of finding evidence of life? All life on Earth depends upon water, so spacecraft in orbit and the next few landers will search for more signs of water to help guide later missions to promising locations.

In addition to looking for living bacteria, NASA will be searching for tiny fossils that might indicate life got a start early in Mars' history but, unlike on our home planet, it did not survive and evolve into larger life forms.

Many of the studies of Mars will involve robots. Someday a spacecraft may pick up samples from Mars and bring them back to Earth where they can be studied in our best laboratories. Eventually, humans may make the daring journey, but many important problems have to be solved before trying such an expensive, difficult, and exciting voyage.