



# ALIENS

IS ANYBODY OUT THERE

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## CHAPTER ONE

### **Little Green Men**

Is there intelligent life beyond earth? Scientists are trying to find out.

Do you think there are aliens that live on other planets in the universe? What do you think they look like?

In science-fiction books and Hollywood movies, the aliens are often "little green men" with long, thin bodies, very large eyes, and hands with only three long fingers. They travel in "flying saucers." In some movies, like E.T. the Extra-Terrestrial, the alien is very kind and friendly. In other movies, like The War of the Worlds, the aliens are dangerous. They want to kill everyone on Earth.

No one knows what aliens really look like - or if they really do exist. However, some scientists think that the universe is so big that intelligent life must exist beyond our world.

But scientists are not waiting for aliens to come to Earth in flying saucers. They think that the first contact with aliens will be with messages. So scientists are trying to find messages from aliens - and at the same time, they are sending messages. They hope that their messages can be the beginning of communication with aliens.

The scientific way to say "aliens" is "extraterrestrial intelligence." Extra means "out" and terrestrial means "of Earth." So extraterrestrial intelligence means any intelligent life form that lives outside of Earth.

Do you think aliens will receive our messages? Will they communicate with us in words or in another way, like musical sounds? That's what the aliens did in the movie Close Encounters of the Third Kind.

## CHAPTER TWO

### SETI

COMMUNICATING WITH EXTRATERRESTRIAL LIFE FORMS IS NOT JUST SCIENCE FICTION.

IT IS REAL SCIENCE.

In the 1997 movie *Contact*, a scientist is trying to find proof that extraterrestrial life exists. She uses a special radio to listen for messages. One day, she hears messages from a faraway star. The messages tell her how to build a machine that will let her travel to that star.

Does this sound like a strange story? Well, it's based on the work of real people at a real organization that wants to make contact with extraterrestrial life-forms.

It's called the SETI Institute. SETI stands for "Search for Extraterrestrial Intelligence." SETI has many important scientists. They are trying to find out if there is life in the universe beyond Earth.

The SETI Institute was started in 1984 in California, USA. But the search for extraterrestrial intelligence started earlier.

In 1960, a young radio astronomer named Frank Drake started the first search for signals from other solar systems. He used a 26-meter antenna, but he didn't hear anything. Many other scientists, however, were interested in his research.

In 1974, the famous Arecibo Message was sent from a 305-meter antenna. It was the strongest message ever sent. The message was a simple picture. Scientists think prime numbers may be easier for aliens to understand, so the picture is 73 lines of 23 characters per line (73 and 23 are prime numbers). The picture shows a person, our solar system, DNA, and some of the chemicals of life.

Ten years later, a group of scientists started the SETI Institute. Today, SETI does many different kinds of research.

One part of SETI uses radio to listen for messages from other intelligent life forms. Why radio? People started sending radio signals into space about 100 years ago. We do it every time we turn on a radio, a TV, or use radar. So, maybe, other intelligent life-forms send out radio signals, too. Maybe one day we will hear alien radio programs!

The SETI Institute also uses telescopes to look for extraterrestrial intelligence. What do they look for? Short but strong lights that are not natural. They think these lights could show that aliens are trying to send signals to us.

Another part of SETI, the Carl Sagan Center, studies astrobiology, which is the study of life in the universe. They want to answer these questions: Where did we come from? Are we alone?

The Carl Sagan Center also researches habitability - if and how people can live in a place. They study different kinds of habitability on Earth, in very difficult places like the Arctic, Antarctica, the highest mountains, and the bottom of the ocean. They also research habitability in other places in our solar system. They want to find out if there are other planets where people could live. To do this, scientists from the National Aeronautics and Space Administration (NASA) fly into space, and they also use the world's best telescopes to look into space.

## CHAPTER THREE

### **Travel Beyond Earth**

#### THE EXPLORATION OF SPACE CONTINUES.

The job of NASA is to research and explore space. It was started in 1958. Only eleven years later, in July 1969, Neil Armstrong became the first person to walk on the Moon.

In 1977, NASA sent two spacecraft, Voyager 1 and Voyager 2, on a mission to explore the planets Jupiter and Saturn. These spacecraft are unmanned - they don't have any people on them.

They found that Jupiter's moon Io has active volcanoes. They also explored the rings around Saturn and sent information that helps scientists understand them better.

After exploring Jupiter and Saturn, however, Voyager 1 and 2 didn't stop. They have sent a lot of information back to Earth. And some of it is very interesting. Here is more information about the Voyager spacecraft:

In 1989, Voyager sent the first color pictures of the planet Neptune. In the beginning, the Voyager spacecraft were going to explore only two planets for five years, but they have already explored all the large outer planets of our solar system and 48 of their moons.

In 1990, Voyager sent the last pictures of our solar system.

In 1998, Voyager 1 became the farthest away man-made thing in space.

As of 2014, the Voyager mission is in its 38th year. The spacecraft are now past Pluto and out of the heliosphere - the area around the Sun. They are still sending information back to NASA.

But what about searching for and making contact with extraterrestrial intelligence? That is a part of the Voyager mission, too.

Both Voyager spacecraft have "the Golden Record." It is a greeting to any life forms that Voyager meets. The message is carried by a 305-millimeter record made of the metals gold and copper. Scientists at NASA chose 115 pictures and many natural sounds including bird songs, wind, and the sea. They put those things on the record to show what life on Earth is like. They also chose music from different countries and times and spoken greetings in 55 different languages.

Of course, the United States isn't the only country to explore space and search for extraterrestrial life.

Russian scientist Konstantin Tsiolkovsky researched building spacecraft as early as 1883. Research in Russia, and then the Soviet Union, continued, and in 1957, Sputnik 1 was the first satellite in space.

The Soviet Union also had the world's first manned space flight. In April 1961, Yuri Gagarin, on the spacecraft Vostok, became the first man to travel in space around planet Earth. It took him 108 minutes.

Today, Russia still has a space program. It is also one of the countries that work on the International Space Station. Maybe by working together, we will find out if we are alone or if there is more intelligent life in the universe.

## CHAPTER FOUR

### **Is anyone Home?**

How can you search for extraterrestrial intelligence while sitting at home?

SETI wants the search for extraterrestrial intelligence to be open to everyone. So they found a way to help people join in. How? With a program called SETI@home. Here's how it works:

SETI usually uses large computers that study data from very big radio telescopes, like the one in Arecibo. But these computers don't have enough power to study all the data that they get from the telescopes. They only study the strongest signals. To study all the signals they get - from the weakest to the strongest - they need a much more powerful (and much more expensive) computer.

So that's where you come in...

The SETI@home project wants to borrow your computer when you aren't using it. How can they borrow your computer?

They give you a screen saver. When you are not using your computer, the screen saver gets some data from SETI and puts it on your computer.

Your computer then studies the data and sends the information back to SETI. As soon as you want to use your computer again, the screen saver stops studying the SETI data. Then, when you stop using your computer, the screen saver starts studying the data again.

In this way, SETI@home is made up of many small home computers, all studying different pieces of data at the same time. It's almost like having one very big computer!

So, with all the scientists, telescopes, radios, and computers, have

we made contact with extraterrestrial intelligence? Or have they tried to make contact with us? Maybe.

### The Wow Signal

Ohio State University, USA, August 15, 1977.

Astronomer Jerry Ehman is looking at some data from a radio telescope called the "Big Ear." Ehman sees a group of numbers and letters that are completely different from anything scientists have seen before. Is it a signal from space? The signal is loud, and it lasts for 72 seconds. Then it stops. Ehman writes "Wow!" next to these numbers and letters.

Scientists looked and looked, but they could never find the same signal again. Was ET trying to call us? Or was it a wrong number?

### The Roswell Aliens

Roswell, New Mexico, USA, July 8, 1947.

A flying saucer falls from the sky and crashes on a farm.

Inside the spacecraft are some aliens. A newspaper tells the story. But later that day, the army says it wasn't a flying saucer. It was a weather balloon. And there were no aliens.

In 1978, Stanton T. Friedman, a scientist interested in flying saucers and aliens, talks to Jesse Marcel.

In 1947, Marcel was a US Army official at Roswell.

He says there was an alien spacecraft and that the Army took the aliens to study them. Other people come forward and say that they saw aliens, too. But the Army repeats its story. It was just a weather balloon.

Some people think Roswell shows that aliens exist. But there is no proof.



## CHAPTER FIVE

### **What Do You Think?**

PEOPLE HAVE DIFFERENT IDEAS ABOUT ALIEN CONTACT.  
HOW DO YOU FEEL ABOUT IT?

How do you feel about contact with extraterrestrial life forms? Do you think we should try to contact aliens? The famous scientist, Stephen Hawking, does not think it's a good idea for us to send messages into space or to answer messages from space. He thinks it might be dangerous for us. Do you agree?

Think about this: You are watching the news on TV. The big story is that scientists have received a message from space. Do you think that's good news or bad news? Why?

Now, read these news stories. How do you feel about each one - excited, worried, afraid, interested, or something else?

1. Scientists at SETI say they got some kind of message from space. It might be an intelligent message, but it might just be electrical signals. They don't know and can't find out. They will have to wait and see if another message comes.

2. Scientists at SETI say they got a message from space. They are sure that it is from an intelligent life form, but they can't read it. We may never know what the message says.

3. Scientists at SETI say they got a message from space. It is in a mathematical language, so we can read it. The message is:

Hello, Earth. We are coming to your planet.

- THE END -

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