SECRET INFORMATION

CAN WE LISTEN TO SIGNALS FROM SPACE?

You have seen many stories about space aliens coming to the earth. Some people are convinced that we really have extraterrestrial visitors who come in UFOs (UFO= unidentified flying object - a spaceship, a flying saucer). Some even claim to have met them. Some believe that even if we cannot meet them, we can at least catch their messages from the space and communicate with them.

Let us consider this problem scientifically. We cannot solve it by experiment, at least not in near future. We can only try to make an educated guess by considering all the facts we know about the universe. Our questions are: Could we ever meet space aliens? Can UFOs come to visit us? Can we ever communicate or exchange messages with other living creatures on other planets?

To be able to form an opinion about the stated problem we must break it down into more specific questions:

1. Is there life, and intelligent life in particular, elsewhere in the universe? - this is a large question, and it can be divided into parts:

1a. Is there life nearby, for example on the other planets (Mars, Venus, Jupiter) of our solar system?

This question can be answered with good plausibility because much is already known about the other planets. They have even been photographed and even visited from space ships. You have learned about the solar system in the school. How are the conditions for living on the other planets? Write down facts you know:

What's your conclusion about the life on other planets?

After examining our solar system we must extend the problem to the universe farther away. In the fact sheet on the following page you see a number of relevant facts about the universe. Study it before you try to answer the questions below:

2. How do you understand the size of the universe?

Think of the dimensions of the universe near us. First, plan how to make a drawing of the solar system in scale, placing the earth in relative distance from the sun. (Hint: if the sun were a ball of 3 feet diameter, the earth would be a half-inch stone some 500 feet away. The small planet Pluto would be 4 miles away. The nearest star would be 56,000 miles from us.) There really is a lot of empty space in the universe!

3. Are there other stars with planets? How many? Could some star have a nice planet like the earth? What do you think about the possibility of life elsewhere? If there is a chance for life elsewhere, how far from us would it be?

4. If there is a chance for life elsewhere, what kind of life could it be?

Think of the forms of life on the earth: human beings have been here only less than half a million years but the life started 500 million years ago: bacteria, small plankton in the sea, krill and crabs, insects and other primitive forms of life were there a long time. Dinosaurs came and went like many other forms of life. How do you think life develops in other parts of the universe? (Nobody knows any facts about this, so you can only make conclusions based on the life on earth.)

5. If there is intelligent life somewhere, do you think they would try to contact others? How? Would we be able to notice that they are sending signals? What about understanding them?

Consider some facts: humans have been there some hundred thousand years. Only 100 years ago they were able to build a radio and send messages through the space. Some animals like dolphins, elephants and chimpanzees are quite intelligent but they do not build radios.

In the time scale of the universe, humans have been there only a fraction of a second. Life in some "nearby" solar system may have existed in an other fraction of time.

What is the chance for a contact with space aliens?

FACTS ABOUT SPACE:

1. Light is the fastest traveller. Light (and radio signals) can travel in the space. It takes 4 minutes for the light to travel from the sun to the earth.

No object can travel as fast or even nearly as fast as the light. A modern space craft travels more than 9 years to Pluto, but for the light it takes only 2 hours 35 minutes to go there!

2. The nearest other star ("sun") is 4 light-years away which means that light travels four years from that star to the earth. With the speed of a modern space craft, it would take 120,000 years to reach the nearest star! If the space craft could have the speed of 1/10th of the speed of the light, it would take "only" 40 years.

3. The structure of the universe around us: earth is one planet of our solar system. It revolves around the sun which is a burning star. The sun is one of the millions of stars in the Milky Way. Milky Way is a galaxy of stars which are kept together by gravity, and which all revolve around its center. There are numerous other galaxies which together form clusters of galaxies, and the clusters in turn make superclusters. Most of the universe is just empty space, stars and galaxies far from each other.

4. Our sun is a very ordinary middle-sized star. There may be 800,000 stars in our galaxy (Milky Way), which have planets. (In fact, only one star with planets has been observed thus far. Planets are too small to be seen from the earth by any existent means.) There are some hundred thousand million galaxies in the whole universe: 100,000,000,000. If you multiply these two huge numbers, you get the number of stars which could perhaps have planets and maybe life on them. (Water, the essential condition for life, has been found elsewhere in the universe.)

Compare your conclusions with the well informed opinions of some scientists:

1. Officials of National Aeronautics and Space Administration of United States started on Oct 12, 1992 a project trying to catch signals from 100 light- years distance. They estimate that there are 800 solar systems within that distance which could have intelligent beings living in them. The congress cut their funds already in 1993 because they did not believe in the project.

2. Dr. Drake of the NASA project believes that there are as many as 10,000 planets with life in the Milky Way.

3. Dr. Hart, a professor in astronomy says: "I don't think there are any intelligent extraterrestrials in our galaxy. If there were, if they were more advanced, they would have traveled here long ago."

4. Professor of Physics, Alan Cromer says: "No one seriously doubts that there is life elsewhere in our galaxy, and even intelligent life. But if it is like the intelligence of bees, or apes, or even Socrates, we will never learn about it."

5. "Even if a signal from another star is heard, the distances are too large for dialogue. It could take hundreds or thousands of years for radio waves to carry the round-trip message."

6. Calvin (by Bill Watterson) "Sometimes I think the surest sign that intelligent life exists elsewhere in the universe is that none of it has tried to contact us."

PRACTICE FOR YOUNGER KIDS

Questions:

1. Do you think it is necessary to find out about space? Why or why not?
2. Do you believe in aliens? Why or why not?
3. Would you want to meet an alien? Why or why not?
4. Do you think aliens would be nice if there were any? Why or why not?
5. Would you want to be an alien? Why or why not?

Drawing: Imagine some space aliens and draw a picture of them.