Astronomy 102 Lab: Life in the Universe

If you own a laptop, please bring it to class. You will submit your answers into the dropbox on Cobra.

Pre-Lab Assignment: Now that you know a lot about the Universe in which we live, you can start to think about whether or not Earth has the only life forms on it that are contemplating the Universe around us. This week, you'll watch a video that addresses the possibility of other life forms in the universe. Answer the following questions before coming to lab.

A) Do you know of any scientific evidence for the existence of other life in the Universe?

B) If life is discovered elsewhere in the Universe, where do you think it will be found first?

C) Let's imagine that tomorrow, NASA announces the definitive discovery of bacterial life on Mars today. How do you think the public would react to the information? How do you think they would react if they proved that an ancient civilization had existed on Mars?

Introduction: One of the great mysteries of the Universe is whether or not there are other forms of life out there besides those we see on Earth. Is the Universe empty of even basic microbial life or are there millions of other technological civilizations out there in the Universe? In this lab, you'll learn more about the search for other forms of life in the Universe.

Procedure: Watch part 3 of the "Origins" NOVA special called "Where are the Aliens?" Take notes on the questions listed. After the documentary, write your answers in complete sentences, and turn in the answers to your instructor via Cobra. Your answers to video labs should be typed and in complete sentences. You may use the answer sheets at either URL below.
http://natsci.parkland.edu/ast/102/labs/life.docx
http://natsci.parkland.edu/ast/102/labs/life.rtf
1. Describe at least two examples of improbable Hollywood portrayals of aliens. Explain why they are unrealistic.

2. How did Frank Drake propose that we go about searching for other life in the Universe?

3A. Write out the Drake equation.

3B. Describe at least two of the terms.

4. How were the first planets outside of the Solar System detected?

5. How does the Solar System provide protection for Earth and the life there?

6. What is our best estimate for the number of Earth-like planets in the Galaxy?

7A. Explain why carbon is so versatile.

7B. Explain why carbon is likely to be the basis for all life in the Universe.

8. List some unlikely places where life was found on Earth.

9. What do astronomers say is the most important requirement for life?

10. What evidence did astronomers find that indicates that Mars may have been a place where life could form?

11. Why do astronomers think that there could be life on Jupiter's moon Europa?

12A. What is the ingredient that astronomers think is crucial for the development of intelligent life?

12B. Why is this ingredient so rare?

13. What was the cause of the signal SETI detected in 1997?

14A. How long have we been listening for radio signals from the sky?

14B. If aliens were on the other side of the Galaxy, how long would it take for a signal from them to reach Earth?

15. In a paragraph of at least five sentences, describe your reaction to the material you've seen in the video today. Do you think it is likely that there is other life out in the Universe and/or that there are other intelligent civilizations? Is it worthwhile for astronomers to devote their time and energy to looking for life elsewhere in the Universe? Explain your answers.