

Astronomy 330



HW #3



- **Carol Regalbuto:** <http://aliens.monstrous.com>
- **Yi Sun:** <http://ufovillage.com>

This class (Lecture 14):

Next Class:

Life in the Solar System

Midterm!!!

Music: For Science – They Might Be Giants

Feb 28, 2008

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Midterm



- 80 min exam in this classroom.
- It will cover material up to, but not including, “Life in the Solar System”.
- Will consist of 16 multiple choice/ true-false questions (worth 40 points) and 2 essay questions (25 and 40 points each) .
- A total of 105 points, so 5 extra credit points.
- You can bring a normal-sized sheet of paper with notes on both sides.

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Review



- What is the Drake Equation, and what do the terms mean?
- What is the origin of the four main biological elements H, O, N, and C?
- Describe the Early Universe. Why do we believe in the Big Bang?
- Why did the first protons form?
- What stages did the Universe go through?
- What do we think will happen to the Universe? Explain the role of Dark Energy.
- How did Galaxies form?

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Review



- What are the properties of a first generation star? In particular, describe which heavy elements they made and how they did it. How are they different than stars today?
- What are the properties of a second generation star? In particular, describe which heavy elements they made and how they did it.
- How do stellar properties impact n_e ?
- What does the presence of complex molecules in interstellar space tell us?
- Describe the techniques that astronomers use to search for planets around stars? What are the limitations?

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Review



- Describe the processes for forming a star and its planets.
- Why does a disk form?
- The planets and the Sun formed from the same interstellar cloud. Discuss reasons why the chemical abundances of the inner planets are different than the outer planets.
- What were the early conditions of the Earth?
- Compare the chemical composition of life to the chemical composition of: a) the crust of the Earth; b) Earth's oceans; and c) the Sun.
- What determines if a planet is in the Habitable Zone?

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Review



- What is HONC and how are they used?
- Why is Carbon important?
- What was the time scale of life on Earth?
- What does “left-handed” life mean?
- What are monomers and polymers? Examples?
- Discuss DNA and RNA. How do they function to assemble proteins that carry and encode the genetic code?
- What are possible scenarios for synthesis of monomers and polymers?
- What was the Miller-Urey experiment and why is it thought to be important for life? Include the role of a reducing atmosphere in your discussion.
- There will be questions on the presentations (true/false).

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