

Review for Exam 2 – Ast 281 – Spring 2009
Thursday 4/2/09, in class

The Exam will be a CLOSED BOOK exam, lasting the whole period. You will be allowed to have calculators and the sheet of planetary data, but I doubt that you will need either of them. The exam will consist of the following types of questions:

- 15 True / False (2 points each)
- 15 Multiple Choice (3 points each)
- 5 Essay - style short answer questions with several parts (like homeworks; total of 75 points)

My exams tend to be fairly long, so answer what you can first and then go back to the more difficult things. Even though long, remember that I grade on a curve, so you all have the same chance. Don't write too much on any one question, but write enough to get your point across. Single word answers on the essays will not be good enough! Likewise, you do not need to justify T/F or multiple choice questions. Usually I try to leave about the right amount of space for each answer – so don't waste time writing too much! The exam will cover ALL material up to and including today's lecture. All material is "fair game" – *i.e.* lecture notes, homework, handouts, assigned readings in the text. However, a good general rule is that if some of the readings cover something we have not discussed at all in class, then you won't see it on the exam. Please note, material *up through the lecture on SETI* (right after spring break) will be on the exam.

This is not a cumulative exam, it covers material since the last exam. However, there are physical principles that we have been using all along that you do need to know from the first part (a good example would be the interaction of EM radiation and matter).

As before, the exam is intended to test how well you understand the concepts, so in general I don't expect you to spend time furiously memorizing all the little details we have discussed. For example, I won't ask you to memorize the dates for all the geologic time periods (but you should have a general idea). I would not expect you to memorize all the interesting extrasolar planet systems or all the Mars mission names, but you should know how we detect extrasolar planets and what the main purpose of the Mars missions has been. A good way to study would be to read through the lecture notes again and be sure you really understand all the concepts, then try to work through the homeworks again, as you can expect exam questions to be written in a similar manner. I will often introduce you to a new situation on the exam and expect you to use your understanding of the material to figure out the answer (I love transporting you to alien worlds...). There are a few things it would be very helpful to have in mind:

- You should know the order of the EM spectrum ($\gamma \rightarrow$ radio), and the approximate wavelengths.
- Know the sequence of events that lead to the Earth as a habitable world, and understand how we know this information.
- Understand what life is, what processes drive it, what requirements it has, and the boundaries of its survival.
- How did life originate, and how do we know this information?
- Understand contemporary Mars issues – discoveries and controversies. What is the evidence for the past climate on Mars? What are the issues related to understanding if there was ever life on Mars?
- Are there other sites in the solar system suitable for life? Where? What issues might we worry about if we brought samples back from these places?
- What is a habitable zone, and what controls it's size?
- Are there areas in our solar system which are outside the traditional "habitable zone" that could potentially be habitable, and what enables them to be habitable?

- Have we discovered other planets outside our solar system? How do they differ from our solar system (and can we explain why they are different), and what will control their habitability? How do we discover them?
- What is the purpose of the Drake equation, and how is it used?
- What is the likelihood that there is other intelligent life elsewhere? What are we doing to explore this question?