Advice for Mid-Term Exam Preparation for Astro 13
Spring Quarter 2010 Instructor: D. Koo

1. Review my lecture notes, then the required chapters in Universe book, then those for Silk's Big Bang. My lecture notes are primary, with the books providing largely supplemental information. The Universe book is particularly helpful in solving problems, having Key Words at the end of each chapter for you to check your understanding, and lots of sample problems from which I will likely choose some for the mid-term exam.

2. Go over each homework and pop quiz problem and look CAREFULLY at my answers and make sure you understand the problem and how it was solved. Take particular care to see what the differences are between your answer and mine.

NOTE: A) I tend to grade the homeworks and pop quizzes VERY generously, with a lot of your mistakes overlooked and ignored – your answer needs to be closer to my level of clarity, simplicity, and accuracy as given in the answer sheets to receive full credit on the mid-term exam. In other words, your answers, even if I gave you full credit, may get far less credit or even none(if it was wrong) for the mid-term. This is especially true for the one sentence definition and one sentence on relevance to cosmology questions.

B) some of the mid-term exam questions will be variations on the problems already given you. Memorization is not as helpful as understanding.

3. Study the Equation sheet in DETAIL. Make sure you know what the equation sheet already has in terms of information – searching during the test is not the way to do well. You should review where the equation was introduced in the lectures and books and make sure you understand when the equation is to apply (note qualifications such as an equation being valid only for certain conditions). I tend to give partial credit for just identifying the right equation to use for a problem. Be careful about units and convert as needed, either to MKS (meters, kg, sec, Joules) or CGS (cm, g, s, ergs) and BE CLEAR in the answer what your units are.

4. All tests will be without a calculator, so I am unlikely to ask for a lot of complicated calculations, as you should have already noted by the answers for the pop quiz. As you will see from my questions and answers, I tend to ask for RELATIVE quantities, usually to the sun or earth. Practice taking ratios FIRST, eliminating the many terms and constants that divide out, and then calculating the answer. For any problem involving equations with several terms, specify the equation and what are the values you have assumed or used for each term and you will get a ***large fraction*** of the total credit. I will assume everyone knows the meaning of the proportionality symbol and how to take log of simple numbers like 10, 100, 10^6, etc. and exponential notation such as 10^{-6} and work with exponents such as $10^{-5} \times 10^5 / 10^2 = 0.01$. Look at box 17-2 and 17-3 in the Universe book to review brightness and magnitudes and distance moduli.

5. Be comfortable with the equations enough that I can change the relative values of the physical constants. Eg, if the gravitational constant were to be 10x larger than the current one, how will the Force Law change? How about the Schwarzschild radius? What if the speed of light were 10x slower? ETC.

6. As the pop-quiz showed, you do need to remember some things (i.e. not every fact is on the equation sheet!) so review the history of the study of cosmology (Greeks, Copernicus, Galileo, etc) and the very rough relative size and time scales for key astronomical objects (solar system, Milky Way, clusters, universe).

GOOD LUCK!