ASTRONOMY 1210
HELPFUL HINTS FOR SECOND MIDTERM (2 April 2014)

The second midterm will be on Wednesday, April 2. You will have the full class period (75 minutes) to complete it.

Coverage: The midterm will cover material concerning science & technology; the structure of matter, atoms, and spectroscopy; the systematics and formation of the solar system; exoplanets; and the Earth, Moon, Mercury, Venus, and Mars (first part) in the lectures and textbook. That is, all lectures from February 24 through March 31; Study Guides 9 through 16 (including Supplements II & III but excepting Guide 14); and Bennett textbook chapters 7 through 9. (Bennett chapters 5 and 6 were optional reading.) Note that Study Guide 14 is optional reading and will not be covered on the test.

Emphasis: The emphasis will be more on the lectures than the textbook reading.

Style: This exam will be very similar to the first exam: mainly objective (true/false, multiple choice, fill-in), with a few brief answer (3-4 sentences) questions. See the “sample questions” for the first exam on the home page. [I am not posting new “sample questions.” Those were intended to give you a feel for the style of questions I ask, not the content. For hints on content, see below and on the reverse.]

You must answer objective parts of the exam on a scantron (bubble) sheet. Be sure to bring a #2 pencil with you.

Review: There will be a question-answer session covering the material on the exam on Tuesday, April 1 at 6 PM in Gilmer 190. Please come prepared with questions.

Things to Study:

The relevant Study Guides from the course home page and your lecture notes. You are not responsible for the material labeled “optional” reading on the Study Guide Index page except to the extent that it was discussed in class.

The reading assignments: these are given for each lecture on the corresponding Study guide.

Key topics on the reverse of this sheet

Things to Ignore:

Numerical values of quantities such as Mars’ mass, the exact percentages of different gases in the planetary atmospheres, and so forth. However, you should be familiar with the relative scales of quantities we have discussed in class. For example: Mars is about half the diameter of the Earth and has an orbital period about twice the Earth’s. You should know how to put the material into quantitative perspective.

The “Mathematical Insight” and “Exercises and Problems” sections in the text. Do, however, read the “Summary of Key Concepts” section.

Tabulated material, such as the detailed planetary data in Table 7.1.

Specific historical dates, except to be able to place the progress of scientific thought into context.

War of the Worlds (not assigned yet).

Details of the various minor spacecraft missions sent to each planet. But you should know what the more important missions (e.g. Apollo, Magellan, Kepler) contributed to our astrophysical understanding of ours and other solar systems.

Names of topological features on the various planets (e.g. Olympus Mons, Aphrodite Terra, ...)

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KEY TOPICS

SCIENCE AND TECHNOLOGY
DIFFERENCE & SYMBIOSIS  EXAMPLES OF CONVERSION & RATES
BENEFICIAL TECHNOLOGIES  ELECTROMAGNETISM  SOCIETAL IMPACT
POPULATION GROWTH AND NEGATIVE EFFECTS OF TECHNOLOGY

MATTER, FORCES, SPECTROSCOPY
ATOMS & THEIR CONSTITUENTS  TYPES OF FORCE
EM WAVES  THE EM SPECTRUM  ATMOSPHERIC WINDOWS
SPECTROSCOPY:  INFLUENCE OF TEMPERATURE ON EM SPECTRUM
      CHEMICAL SIGNATURES  DOPPLER EFFECT

SOLAR SYSTEM (GENERAL) & EXOPLANETS
SYSTEMATICS:  PLANETARY ORBITAL PLANES & MOTIONS
FORMATION:  INNER VS. OUTER PLANETS:  PHYSICAL PROPERTIES
OTHER PLANETARY SYSTEMS:  SEARCH TECHNIQUES  RESULTS
KEPLER MISSION  HOT JUPITERS & SUPER-EARTHS

TERRESTRIAL PLANETS
GENERAL PROPERTIES  DISTINCTION FROM JOVIAN PLANETS
PLANETARY “CONFIGURATIONS”  “ELONGATIONS” & BRIGHTNESS

EARTH
UNIQUENESS  ATMOSPHERIC COMPOSITION  WATER
AGE DATING METHODS & TIMESCALES  SEDIMENTARY VS. IGNEOUS ROCKS
INTERNAL STRUCTURE  DENSITY AS COMPOSITION INDICATOR
INTERNAL DIFFERENTIATION  SEISMIC WAVES  PLATE TECTONICS & EFFECTS

MOON
ALBEDO  ESCAPE OF ATMOSPHERE  APOLLO MISSIONS & IMPORTANCE
SURFACE:  IMPACT CRATERING  HIGHLANDS VS. MARIA
CRATER AREA DENSITY AS AGE INDICATOR
ORIGIN  SURFACE HISTORY  LATE HEAVY BOMBARDMENT

MERCURY
SURFACE VS. EARTH’S MOON

VENUS
VENUS COMPARED TO EARTH  PHASES  CLOUDS
US & SOVIET MISSIONS  LANDERS  MAGELLAN/RADAR MAPPING
SURFACE FEATURES  EVIDENCE FOR CATASTROPHIC RESURFACING
ABSENCE OF ACTIVE PLATE TECTONICS
ATMOSPHERE:  CHARACTERISTICS VS. EARTH’S  GREENHOUSE EFFECT

MARS
COLOR & EXPLANATION  DISTANCE FROM EARTH/BRIGHTNESS VARIATIONS
P. LOWELL & “CANALS”  EXPLANATION OF CANALS
TERRAIN:  CRATERS, VOLCANOS, VALLEYS, POLAR CAPS (COMPARED TO EARTH)
MANTLE UPEWELLING BUT NO EARTHLIKE TECTONIC ACTIVITY
EVIDENCE FOR WATER IN PAST & ICE NOW

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