24 March, 2014 R. W. O'Connell

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, ...)

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	
	INNER VS. OUTER PLANETS:	PHYSICAL PROPERTIES
FORMATION:	NEBULAR MODEL & HOW IT EXPLAINS 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 AREAL 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 UPWELLING BUT NO EARTHLIKE TECTONIC ACTIVITY		
EVIDENCE FOR WATER IN PAST & ICE NOW		