

ASTRONOMY 1210: HELPFUL HINTS FOR FINAL EXAM

Coverage & Emphasis: The final is not comprehensive. It will concentrate on the second half of the course. It will emphasize, in order of importance:

- 1) Material since the second midterm: landers on Mars, *War of the Worlds*, UFO's as pseudo-science, terrestrial atmospheres, Jupiter, Saturn, and the outer planets; the outer satellites; interplanetary matter & impacts on Earth; life in the universe. That is, lectures from April 7 through the end of the semester; Study Guides 17 through 23; the novel *War of the Worlds*; and Chapters 10-12 and 24 in the Bennett textbook.
- 2) Subjects covered on the second midterm, though with less specificity.
- 3) The most important topics from the first midterm.

The emphasis will be *more on the lectures* than the reading. (Note that the lectures went considerably beyond the coverage in the textbook on some topics.) Any topic given prominence in both the reading and the lectures is a good candidate for one or more exam questions.

Note: The final exam will be worth only **325** points—i.e. only 40 points more than a midterm. You should adjust the effort you plan for this course with respect to your effort in other courses accordingly. You will have *two hours* to complete the exam. It will be held **2–4 PM, Saturday, May 3 in CLK 107**.

Style: The final will be very similar to the midterm exams: mainly objective (true/false, multiple choice), with a smaller number of fill-in and brief answer questions. 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 concerning the exam, on **Friday, May 2, 6-7 pm in Gilmer 190**. Please come prepared with questions.

Things to Study:

All the *lecture notes & study guides*, with emphasis on the second half of the course. Important tip: study from hardcopies, not from a computer screen.

All the *reading assignments*. These are given for each lecture on the corresponding study guide. It would be useful to review the end-of-chapter sections titled “The Big Picture” and “Summary of Key Concepts” for all textbook chapters assigned this semester.

The two *midterm exams*; topics, and even questions, could well be repeated.

Key topics (since the second midterm) listed on the reverse of this sheet.

Things to Ignore:

Numerical values of detailed quantities such as masses of the planets, their orbital radii, and so forth. However, you should be familiar with the *relative scales* of quantities we have discussed in class. You should know how to put the material into *quantitative perspective*.

The “*Mathematical Insight*” sections in the text.

The “*Exercises and Problems*” sections in the text contain items that go beyond what we have covered in class. I do **not** recommend that you use these to review the material.

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.

Character development, literary qualities in *War of the Worlds*.

Details of the various *spacecraft* sent to each planet. But you should know what the more important missions (Apollo, Voyager, Viking, Mars rovers, Magellan, Cassini) contributed to our astrophysical understanding of the solar system.

Names of features on the various planets (e.g. the A, B, and F rings of Saturn), names of specific comets/asteroids other than Halley, names of terrestrial impact craters, and so forth.

KEY TOPICS

MARS, POSSIBLE LIFE ON MARS, & CULTURAL IMPACT

EVIDENCE FOR WATER ON MARS
VIKING LANDERS TESTS FOR LIFEFORMS & RESULTS
PATHFINDER & ROVER LANDERS MARTIAN GEOLOGY
METEORITE EVIDENCE FOR MARTIAN LIFE SATELLITES & ORIGIN
P. LOWELL & "CANALS" EFFECT ON POPULAR CULTURE
H.G. WELLS & "WAR OF WORLDS": SCIENTIFIC AND TECHNICAL CONTENT (NOT LITERARY)
UFO'S: AS EXAMPLE OF ANOMALISTIC SCIENCE SCIENTIFIC EVALUATION

TERRESTRIAL PLANET ATMOSPHERES

COMPARISON OF ATMOSPHERES & SURFACES TECTONIC ACTIVITY VS. SIZE
ORIGIN & EVOLUTION OF ATMOSPHERES WATER TRAPPING/LOSS
CARBONATE CYCLE GREENHOUSE EFFECT GLOBAL WARMING

JUPITER & SATURN

DISTINCTIONS BETWEEN JOVIAN & TERRESTRIAL PLANETS ICY SATELLITES
COMMON FEATURES OF JOVIAN PLANETS VOYAGER, CASSINI MISSIONS
INTERIOR STRUCTURE METALLIC HYDROGEN
ATMOSPHERES: CLOUD LAYERS JUPITER RED SPOT
GALILEAN SATELLITES (4): NAMES & SIZES DIVERSITY
VOLCANOS ON IO: TIDAL FLEXING ORIGIN
ICE LAYERS & OCEANS ON EUROPA ICY CRUSTS: FLOWING
ORIGIN OF RINGS BY TIDAL DESTRUCTION ROCHE LIMIT
RINGS: THINNESS, STRUCTURE INDEPENDENT REVOLUTION
ENCELADUS: EVIDENCE FOR SUBSURFACE OCEAN
TITAN: UNIQUENESS OF ATMOSPHERE NITROGEN/HYDROCARBONS
CASSINI MISSION/HUYGENS LANDER

THE OUTER PLANETS

DISCOVERY OF URANUS NEPTUNE AS A TEST OF NEWTONIAN THEORY
MIRANDA: SURFACE UNIQUENESS & VIOLENT HISTORY
PLUTO: DISTINCTIONS FROM JOVIAN PLANETS & DEMOTION TO 'DWARF' PLANET
KUIPER BELT OBJECTS

INTERPLANETARY MATTER

TYPES, TOTAL MASS ORIGIN AS REMNANTS OF PROTOPLANETARY NEBULA
ASTEROIDS: DISCOVERY NUMBER ORBITS
ASTEROIDS: PHYSICAL PROPERTIES (SIZE & COMPOSITION) POTENTIAL ECONOMIC VALUE
COMETS: "DIRTY SNOWBALLS" OORT CLOUD ORBITS
COMETS: EVOLUTION & APPEARANCE ALONG ORBIT TAILS
HALLEY'S COMET: AS PERIODIC TYPE HISTORY
IMAGING OF COMET NUCLEI BY SPACECRAFT
METEORIDS: TYPES METEOR SHOWERS VALUE OF METEORITES
IMPACTS ON EARTH: EVIDENCE FOR PRE-HISTORICAL & CONTINUING IMPACTS
TUNGUSKA & CHELYABINSK EVENTS
IMPACT ENERGY: DEPENDENCE ON VELOCITY AND RADIUS
IMPACT EFFECTS & FREQUENCIES CONNECTION TO BIO-EXTINCTIONS

LIFE IN THE UNIVERSE

LIFE ON EARTH: ORIGIN & HISTORY PANSPERMIA
BIOCHEMICAL BASIS DNA FUNCTION "HABITABLE ZONE"
OTHER BIOSPHERES? MARS, EUROPA, ENCELADUS, TITAN EXOPLANETS?
LIKELIHOOD OF INTELLIGENT LIFE IN GALAXY: METHOD & IMPLICATIONS
INTERSTELLAR EXPANSION SETI "ALIEN ARTIFACTS"
THE "RECOGNITION CHASM"