

## STUDY GUIDE FOR TEST II

### CHAPTER 8: THE EARTH AS A PLANET    CHAPTER 9: THE MOON

1. albedo
2. aerosols
3. role of ozone and carbon dioxide in atmosphere
4. greenhouse effect
5. layers of atmosphere (in order)
6. convection
7. cyclone
8. anticyclone
9. seismic wave
10. P wave (compressional)
11. S wave (shear or transversal)
12. behavior of S and P waves in liquid
13. layers of Earth's interior (crust, mantle, outer core, inner core) and their consistencies
14. layers of mantle
15. differentiation
16. plate tectonics and continental drift
17. evidence for continental drift
18. Pangaea
19. viscosity
20. subduction
21. igneous rock
22. sedimentary rock
23. metamorphic rock
24. rock cycle
25. mineral
26. silicates
27. oxides
29. sulfides
30. carbonate
31. sulfate
32. radioactive dating and its use to determine ages
33. half-life
34. magnetosphere
35. ionosphere
36. aurora
37. Van Allen belts
39. planetesimal
40. the agent for formation of free oxygen in the atmosphere

1. rays
2. rilles
3. maria
4. highlands
5. impact craters vs volcanic craters
6. composition of Earth and Moon in relation to certain atomic isotopes (p. 178)
7. Moonquakes
8. internal structure of Moon [layers: crust, mantle (lithosphere, asthenosphere), core]
9. thickness of crust on near side vs far side
10. magnetic field
11. plate tectonics
12. four hypotheses on origin and evidence for and against each
13. why there is no atmosphere
14. cause of maria

### CHAPTER 10: VENUS

1. why Venus is so bright
2. role of CO<sub>2</sub> in atmosphere
3. greenhouse effect (fig. 10.2)
4. surface temperature
5. magnetic field
6. retrograde rotation
7. stages of exploration of a planet
8. Pioneer Venus
9. use of radar to determine rotation
10. surface atmospheric pressure
11. composition of clouds and atmosphere
12. subsolar point
13. aurorae on Venus (or night glow: fig. 10.8)
14. types of terrain and their percentage of total area
15. 3 main regions of highlands
16. continental drift
17. volcanic activity
18. role of water vapor in early atmosphere
19. where CO<sub>2</sub> was before it was in atmosphere

## CHAPTER 11. MARS AND THE SEARCH FOR LIFE

1. Percival Lowell and the Martian canals
2. Mariner 9
3. Viking
4. surface pressure and gravity
5. composition of atmosphere
6. polar caps
7. effects of eccentric orbit
8. global dust storms
9. two types of terrain
10. Tharsis region
11. Valles Marineris
12. Olympus Mons and its possible cause
13. chaotic terrain
14. sand dunes
15. soil
16. role of iron oxide
17. Viking experiments to test for life
18. moons of Mars and general properties

## CHAPTER 12: MERCURY

1. difficulty in observing Mercury and why
2. surface gravity
3. relationship between rotational period and orbital period and its cause
4. spin-orbit coupling
5. Mariner 10 and its orbit and the implications for viewing the surface
6. magnetic field and magnetosphere
7. relative size of core and mantle
8. scarps and their possible origins
9. Caloris Planitia and its implications for density of crust
10. weird terrain and its cause

## CHAPTER 13: JUPITER: GIANT AMONG GIANTS

1. mass
2. shape and cause
3. differential rotation

4. lightning
5. Pioneer 10 and 11
6. Voyager 1 and 2
7. "grand tour"
8. composition of upper atmosphere
9. belts
10. zones
11. Great Red Spot
12. layers of interior
13. energy emission
14. magnetic field
15. radiation belts and Io's influence
16. density and albedo of Galilean satellites as a function of distance from Jupiter
17. names of Galilean satellites (in order) and properties
18. cause of Io's volcanism
19. orbital resonance
20. Io's torus of gas

## CHAPTER 14: SATURN AND ITS ATTENDANTS

1. Huygens and his discoveries
2. Cassini and his discoveries
3. differentiation
4. general composition
5. belts and zones and overall appearance
6. layers of interior
7. excess energy production
8. magnetic field
9. Pioneer 11
10. Voyagers 1 and 2
11. general properties of moons discussed in class
12. Titan
13. Dione
14. Tethys
15. Mimas
16. Iapetus
17. Enceladus
18. Hyperion
19. Phoebe and its likely origin
20. Rhea

21. size of particles in ring
22. Roche limit and possible origin of rings
23. cause of Cassini division
24. ringlets
25. shepard satellites and their action on a ringlet
26. spiral wave
27. implication of asymmetry in rings
28. spokes and their cause (fig. 14.24)

## CHAPTER 15: THE OUTER PLANETS

### Uranus

1. discoverer
2. tilt of axis and seasons
3. composition
4. atmospheric circulation
5. magnetic field and tilt of magnetic axis
6. Oberon
7. Titania
8. Umbriel
9. Ariel
10. Miranda

### Neptune

1. Galle, Adams, and Leverrier
2. Voyager 2
3. atmospheric activity and features
4. magnetic field
5. auroras
6. rings
7. Nereid
8. Triton

### Pluto

1. Clyde Tombaugh
2. blink comparator
3. orbital curiosities
4. role of methane
5. possible origins
6. Charon

## CHAPTER 16: SPACE DEBRIS

1. asteroids (minor planets)
2. Bode's law
3. G. Piazzi
4. Ceres
5. Pallas
6. Juno
7. Vesta
8. composition
9. orbital resonances and the asteroids (Kirkwood's gaps)
10. best hypothesis of origins of the asteroids
11. comet
12. Edmund Halley and his comet
13. orbits of comets
14. Oort cloud
15. Nemesis
16. Fred Whipple and his "dirty snowball" hypothesis
17. nucleus
18. coma
19. ion tail
20. dust tail
21. radiation pressure
22. sublimation and gas jets on comets
23. magnetic field and current sheet
24. meteor
25. fireball or bolide
26. meteoroid
27. meteorite
28. 3 classes of meteorites
29. chondrites
30. carbonaceous chondrites and amino acids
31. meteor showers and their causes
32. interplanetary dust
33. zodiacal light
34. gegenschein

## CHAPTER 17: ADDING IT ALL UP: FORMATION OF THE SOLAR SYSTEM

1. composition of Sun
2. solar wind
3. prograde motion
4. obliquities
5. terrestrial planets vs. outer planets
6. evolutionary theories of solar system formation
7. nebular hypothesis
8. catastrophic theories
9. amounts of deuterium in planets and its implications
10. accretion theory
11. magnetic braking of Sun
12. stages in solar system formation
13. solar nebula
14. refractory elements
15. two stages of terrestrial planet formation
16. dispersal of leftover gas and dust by Sun
17. 3 types of evidence for extra-solar planets (wobble in star position, Doppler shifts, infrared observations)