ASTR 1010 Exam #3 (Chapters 8 - 11.1) November 17, 2011

This summarizes most, but not necessarily all, topics that will be on the exam

* understand what are sun, planets, asteroids, comets; their composition
* distinguishing characteristics of terrestrial and jovian planets
* why is mercury so hot; why is Venus even hotter; what's the greenhouse effect
* Saturn's rings made of; what and where are asteroid belt, Kuiper belt, Oort cloud
* alignment of most orbital, rotational axes suggests what; what are exceptions
* where did the 2% of dust in the universe come from; what is the nebular theory
* force causing gas clouds to collapse; why does a collapsing rotating cloud flatten
* know generally how disks form planets (planetesimal growth, gravitational attraction)
* frost line; why does this yield 2 types of planets; how does it explain their differences
* heavy bombardment phase; likely explanations for how Earth acquired its water, moon
* what's the age of the solar system; why are objects larger than ~500 km all round
* 3 interior layers of terrestrial planets; what is the lithosphere; differentiation
* what is seismic activity; propagation of seismic waves can reveal what
* 3 ways interiors of planets are heated; what dominates interior heating now, for Earth
* why are the smaller worlds less geologically active; what is outgassing
* what causes all magnetic fields; how does that explain the field of a bar magnet
* 4 dominate processes that shape a terrestrial surface; when did most cratering happen
* what drives tectonic activity; where does the majority of heat for this come from
* why does a lot of seismic/volcanic activity occur where plates collide/subduct
* what's a volcanic "hot spot"; how were the Hawaiian islands formed
* what's erosion; why does Earth have more erosion; what planet looks like Earth's moon
* what are the lunar highlands and maria; which is older; how did they form
* what are Olympus Mons and Valles Marineris; what are Mars' ice caps made of
* what's the evidence that liquid water once flowed on Mars
* what's an atmosphere; what is Earth's mostly made of; how high does it extend
* what causes air pressure; why does it decrease with altitude
* how greenhouse gases, distance from sun, and reflectivity affect surface temperature
* why do most x-rays and ultra-violet light emitted by sun not reach the surface of Earth
* why is the sky blue; why are sunsets red; what causes the aurora
* ways for a planet to get its atmospheric gases, ways for it to lose those gases
* where do the slight atmospheres of Mercury and the Moon come from
* how do the atmospheres of Mars and Venus compare to Earth (composition, amount)
* why are seasons on Mars more dramatic than Earth; what are its polar caps made of
* how do we think Mars lost its atmosphere; why does Venus have so little weather
* why is Venus so hot; where did its thick atmosphere come from
* how does the carbon dioxide cycle keep Earth temperature stable (on long timescales)
* where does the oxygen in our atmosphere come from
* what change in our atmosphere are scientists saying is causing global warming
* what are the jovian planets; how do the compositions of J & S differ from U & N
* why are jovian planets oblate; what causes the colors seen; what is the Great Red Spot

Know the names of all the planets, their order from Sun, and type (Terrestrial vs Jovian)