Astronomy 161 -- Autumn 2007
End-of-Quarter (Last Week) Study Guide

This study guide covers the lectures from Nov 19-30 that followed Quiz 4. All of the other lectures are covered by the previous study guides.

This list, together with the other four study guides from Quizzes 1 through 4, constitute the study guide for the Final Exam.

Moons of Jupiter

- Galilean moons of Jupiter
- volcanos on Io
- deep ice on Europa
- icy vs. rocky moons
- young vs. old surfaces

Moons of Saturn

Enceladus
- Water fountains and cryovolcanism
- Tidal heating driving cryovolcanism
- Ices from Enceladus build the E ring

Titan - the large moon of Saturn
- Thick Nitrogen & Methane atmosphere
- Only Solar System moon with a heavy atmosphere
- Methane plays role of Water on Titan
- Has an atmosphere because it is so cold

Planetary Rings

- All Jovian Planets have Rings
  - dusty rings of Jupiter
  - bright, icy rings of Saturn
  - narrow, dark rings of Uranus and Neptune
- Ring Properties
  - Bands of orbiting dusty particles and iceballs
  - Role of shepherd moons
  - Role of orbital resonances
- Ring Origin
  - Amount of ring material equivalent to a small icy moon
  - Roche radius and tidal disruption

Icy Worlds

- Triton
  - Neptune's giant moon
  - Young surface repaved by cryovolcanism
  - Nitrogen geysers
- Pluto & Charon - Dwarf Planet
  - composition
  - similarities to Triton
  - Largest of the Plutinos
- Eris: The Largest Dwarf Planet
  - Member of the Scattered Disk
  - similarities to Pluto
- Trans-Neptunian Objects (TNOs)
  - Family of icy bodies that orbit beyond Neptune
  - Kuiper Belt Objects (KBOs) - confined by resonances with Neptune
  - Plutinos - objects in 3:2 resonance with Neptune
  - Scattered Disk Objects

Comets

- Comet orbits are long ellipses
  - Short- and Long-Period Comets
  - Origin of Short-Period comets in the Kuiper Belt
  - Origin of Long-Period comets in the Oort Cloud
- Structure of Comets
  - Nucleus and Coma (approximate sizes and properties)
  - Dust and Ion Tails (different causes)
- Dirty Snowball model of comet nuclei

Asteroids & Meteoroids

- Asteroids
  - Small rocky/metallic bodies of the inner solar system
  - Asteroid belt between Jupiter and Mars
  - Orbits strongly influenced by Jupiter
    - Main Belt confined by resonances with Jupiter
    - Kirkwood Gaps & asteroid families - in specific resonances with Jupiter
  - Composition and types of asteroids
- Meteroroids:
  - Tiny bits of rock/metal orbiting the Sun
  - Origin in Comets and asteroids
  - Seen as meteors, collected as meteorites

Extrasolar Planetary Systems

- Searches for planets around other stars
  - Astrometric Wobble
  - Doppler Wobble
  - Planetary Transits
  - Gravitational Microlensing
- Extrasolar planetary systems
  - Jupiter-sized planets close to their parent stars
  - Prospects for finding Earth-like planets
  - Basic conditions for Life
  - The Habitable Zone
  - The role of size in determing if a planet is habitable
  - Spectroscopic Biomarkers of life