

Physics 174

Study Guide for Exam III

13 April, 2007

Exam III will have a format similar to the first two exams, with 50 multiple choice questions and some "matching" questions. The sample questions below provide a guide for the more important concepts most likely to appear on the exam, but these are only one resource. Students should also prepare for the exam by answering (1) the review questions at the end of each chapter of the textbook, (2) the questions in the "Building Scientific Arguments" sections, and (3) old quiz questions posted on the course website. The internet is also a good resource, especially for recent findings from the Cassini mission around Saturn. Students should also be prepared to identify the jovian worlds and some of the more noteworthy moons from either global images or close-ups of their surfaces.

Sample questions

In what ways does Pluto differ from the eight major planets?

Name the seven moons larger than Pluto and briefly describe them.

Why didn't the asteroids form a planet? How did this happen? What evidence do we have?

What are Trojan asteroids?

Describe the dwarf planet Ceres.

Describe the physical properties of some of the other asteroids observed from space probes.

Describe the typical internal structure of a jovian planet.

Compare the atmospheric composition of the jovian planets to the Sun, both in terms of molecular and elemental abundances.

What is the Great Red Spot? What is the Great Dark Spot?

Explain why the atmospheres of Saturn and Jupiter differ in appearance.

Describe a typical ring system around a jovian planet.

What are the causes of the detailed structure of Saturn's rings?

How do the four Galilean satellites resemble a planetary system?

Compare the surface features and levels of geologic activity of the Galilean satellites.

Describe the mechanism that drives the geologic activity of the Galilean satellites.

How do the magnetic properties of the Galilean satellites tell us about the possibility of liquid water beneath their surfaces?

Compare the amounts of subsurface water on the Galilean satellites. Which one has the most water?

How have astronomers studied the surface of Titan?

What observational evidence do we have for a methane cycle on Titan?

What observations of Titan suggest that the surface is young and geologically active?

What makes Enceladus so interesting for a moon only 500 km across?

Describe Mimas and Iapetus.

Compare the crater counts on some of the moons of Saturn and what this tells us about their relative ages and levels of geologic activity.

How does Miranda differ from the other moons of Uranus?

How is Triton like and unlike Pluto?

Describe the physical properties of the Pluto-Charon system. Why can it be called a double planet?

Where do the typical tiny moons of the jovian planets come from?

What is the Kuiper Belt?

Compare the physical properties of typical objects in the Kuiper Belt and the Asteroid Belt.

What is the largest known object in the Kuiper Belt? (Hint: it's not Eris.)

What is Eris?

What is a Centaur?

What is the Oort Cloud? What evidence do we have for its existence?

Describe the physical properties of some of cometary nuclei observed from space probes.

Compare the orbital properties of:

- Major planets;
- Objects in the Asteroid Belt;
- Kuiper Belt Objects;
- Scattered Disk Objects;
- Objects in the Oort Cloud.

Where do short-period comets come from? Long-period comets?

What causes a meteor shower?

How does a meteorite differ from the typical object we see as a meteor?

What is the difference between a typical meteorite "fall" and "find"?

What three models have been proposed for the formation of the Solar System? Why have two of them been discarded?

How does the accretion model of the formation of the Solar System account for the observed properties of the planets?

List some observations of young stellar objects that support the accretion model of the Solar System.