Physics 109: Homework Questions
(Handout #4)

Homework #7 Due 22 Oct Deadline 26 Oct

7.1 What are P- and S-waves, how do they differ, and what information do they tell us?

7.2 Describe the evidence indicating that the Earth is geologically active. What is the primary energy source powering this activity?

7.3 Discuss the origin and evolution of the gases, nitrogen (N_2) and oxygen (O_2), in the Earth's atmosphere. Why are these gases the major constituents of the atmosphere?

7.4 Occasionally, but very rarely, we see the planet Venus cross the disk of the Sun. What part of the shadow of Venus are we in when that happens? What is the phase of the Earth, as seen from the Moon, during a total solar eclipse?

7.5 Describe what changes will occur to the motions in the Earth-Moon system in the far future as a result of tidal forces.

Homework #8 Due 5 Nov Deadline 9 Nov

8.1 Discuss the techniques astronomers use to determine the ages of planetary surfaces. Under what conditions do these techniques fail? Site specific planets or satellites (moons) as examples in your response.

8.2 Why is it surprising that the planet Mercury has a high density and a magnetic field?

8.3 Discuss the origin and evolution of the gases, nitrogen (N_2) and oxygen (O_2), in Venus's atmosphere. Why are these gases not major constituents of the atmosphere of Venus? Compare your answer for Venus to the answer you found for the same question about the Earth's atmosphere (see homework #7.3).

8.4 Discuss and compare the role of the greenhouse effect on both Venus and the Earth.

8.5 State which of the following characteristics of Venus suggest a primitive surface (little disturbed since planet formation) and which suggest an evolved surface (affected by geological processes such as erosion, differentiation, and plate tectonics): (a) Craters (b) A large, rifted canyon (c) Coronae (d) Arachnoids (e) Basaltic surface rocks (f) Sedimentary surface rocks (if any).