Physics 109: Homework Questions
(Handout #5)

Homework #9 Due 12 Nov Deadline 16 Nov

9.1 What evidence do we have that the volcanos of the Tharsis region are younger than most of the rest of the surface of Mars? What differences in the properties of runoff channels and outflow channels show that the two types of channels originated in different ways?

9.2 Olympus Mons on Mars, the Hawaiian islands on Earth, and shield volcanos on Venus like Gula Mons and Sif Mons are believed to be examples of hot-spot volcanism whereby a hot region beneath the planet's surface extrudes molten rock over a long period of time. Describe and compare the characteristics of these volcanos and discuss what these features imply about tectonic activity on the three planets.

9.3 Compare the evolution of the atmospheres of Venus, the Earth, and Mars. Explain how the atmospheres of these three planets turned out so differently from each other, even though they may all have started with roughly the same chemical composition.

9.4 Give an argument both for and against the presence of life (either current or extinct) on Mars.

9.5 How do we know that the Great Red Spot on Jupiter is a high pressure region? Explain the value of making infrared images of Jupiter's atmosphere.

Homework #10 Due 19 Nov Deadline 23 Nov

10.1 Which of the four giant gas planets (Jupiter, Saturn, Uranus, and Neptune) are self-luminous, how do we know this, and what is the source of their internal energy?

10.2 Compare and contrast the magnetic fields of the four giant gas planets. In what ways are they similar to and different from the Earth's magnetic field?

10.3 Describe the importance of the moon Charon for understanding the nature and evolution of Pluto. In what ways is the Pluto-Charon system unique in the solar system?

10.4 Compare the rings that surround the four giant gas planets. Briefly discuss their similarities and differences.

10.5 Why are the ring systems of the giant gas planets so remarkably flat? What is the origin of the sharpness of the edges of many planetary rings?