Physics 109: Homework Questions (Handout #6)

REMINDER: HOMEWORK MUST BE YOUR OWN ORIGINAL WORK

Homework #11 Due 1 Dec Deadline 1 Dec

11.1 Describe the similarities and differences among the four Galilean satellites of Jupiter. Give a reason why the satellites are similar and give one for why they differ.

11.2 Why might one expect an icy satellite to have experienced less internal heating than a rocky satellite? Why were astronomers surprised to learn that the satellites of Jupiter showed evidence for tectonic and volcanic activity?

11.3 Both the Moon and Triton (the largest satellite of Neptune) raise tidal bulges on the planet they orbit. Why does the tidal bulge on Neptune cause Triton to spiral inward, while the tidal bulge on the Earth causes the Moon to spiral outward?

11.4 Describe the techniques used to determine the ages of meteorites. What do these different ages tell us about the origin of meteorites and the evolution of their parent bodies?

11.5 What forces control the direction of a comet's tail? Why do comets have two tails that are not aligned with each other?

Homework #12 Due 8 Dec Deadline 8 Dec

12.1 What do we mean when we say the Sun has a temperature of 5800 K? Why is nearly all of the Sun's energy produced in the inner 1.5% of its volume?

12.2 What are the ingredients and the end result of the proton-proton chain in the Sun? Why is energy released in the process?

12.3 Why are scientists trying so hard to detect solar neutrinos? Explain why the gallium-based neutrino detection experiments (SAGE and GALLEX) are particularly important in this regard.

12.4 Why is the relatively slow rotation of the Sun something of a puzzle that needs to be explained by models of the solar system's formation? What is the explanation?

12.5 What influence did Earth's location in the solar nebula have on its final composition?