

Chp 7-Review Questions. Observing the Dynamic Giant Planets

1. In what ways are the motions of Jupiter's atmosphere like the motion of water stirred in a pot (see Figure 7-2b)? In what ways are they different?
2. How do the swirling atmospheres of Jupiter and Saturn compare?
3. What would happen if you tried to land a spacecraft on the surface of Jupiter?
4. What are the belts and zones in the atmospheres of Jupiter and Saturn? Is the Great Red Spot more like a belt or a zone? Explain your answer.
5. Describe the internal structures of Jupiter and Saturn, and compare them with the internal structure of Earth.
6. Briefly describe the evidence supporting the idea that Uranus was struck by a large planet-like object several billion years ago.
7. Describe the seasons on Uranus. In what ways are the Uranian seasons different from those on Earth?
8. Why are Uranus and Neptune distinctly greenish-blue in color, while Jupiter and Saturn are not?
9. How many rings encircle Saturn? Draw a sketch.
10. If Saturn's rings are not solid, why do they look solid when viewed through a telescope?
11. Compare the rings that surround Jupiter, Saturn, Uranus, and Neptune. Briefly discuss their similarities and differences.

Chp 7-Discussion Questions. Observing the Dynamic Giant Planets

1. The classic science fiction films *2001: A Space Odyssey* and *2010: The Year We Make Contact* both involve manned spacecraft in orbit around Jupiter. What kinds of observations could humans make on such a mission that cannot be made by robotic spacecraft? What would be the risks associated with such a mission? Do you think that a manned Jupiter mission would be as worthwhile as a manned mission to Mars? Explain your answers.
2. Suppose that Saturn were somehow moved to an orbit around the Sun with semimajor axis 1 AU, the same as Earth's. Discuss what long-term effects this would have on the planet and its rings.
3. Sir William Herschel, a British astronomer, discovered Uranus in 1781 and named it Georgium Sidus (Latin for "Georgian Star"), after the reigning monarch, George III. What name might Uranus have been given in 1781 if an astronomer in your country had discovered it? Why? What if it had been discovered in your country in 1881? In 1991?

Chp 7-Collaborative Group Exercises. Observing the Dynamic Giant Planets

1. Using a ruler with millimeter markings on the first image of Jupiter in the text (Figure 7-1a), determine the ratio of the longest width of the Great Red Spot to the full diameter of Jupiter. Each group member should measure the image and all values should be averaged.
2. The text provides different years that spacecraft have flown by Jupiter and Saturn. List these dates and create a time line by listing one important event that was occurring on Earth during each of those years.
3. If the largest circle you can draw on a piece of paper represents the largest diameter of Saturn's rings, about how large would Saturn be if scaled appropriately? Which item in a group member's backpack is closest to this size?