

1. In order to evaluate Hubble’s constant for distant galaxies, what two quantities must you measure?
2. Sketch a picture of a radio galaxy as seen with a radio telescope. What would you see with an optical telescope?
3. What is the “look-back” effect? What does the universe look like from Earth?
4. Describe what the universe was like 1 second, 10,000 years, and 5,000,000,000 years after the big bang.
5. What is the source of the *cosmic microwave background radiation*?
6. What is *Hubble’s Law*?
7. How would an “open” universe differ from a “closed” universe?
8. What is a quasar?
9. Explain Olbers’ Paradox.
10. Describe how it is possible to actually see what the universe was like in the distant past. Describe the first event we can see (i.e., the event closest to the Big Bang). What sort of telescope is needed to see this event?
11. Describe the constituents of the Universe in each of the following eras: hadron, lepton, matter, and radiation.
12. Describe the evidence for “dark energy” in the universe.
13. Describe the evidence for “dark matter” in the universe.
14. How can you measure/prove the curvature of space? According to Einstein, what causes the curvature of space?