

Astronomy 1020 Exam 5 Review Questions

[For the Final Exam (which includes Exam 5), use the Review Questions from Exams 1-5.]

1. Describe and draw the Hubble classification scheme of galaxies.
2. What is the Hubble classification of the Milky Way?
3. Morphologically, what occurs as one progresses from Sa to Sc galaxies? What about SBa to SBc galaxies?
4. What are distance indicators and list each of them and when they are used. What is the Tully-Fisher relation?
5. What is Hubble's law and what does it tell us about the Universe?
6. What are the 2 most massive members of the Local Group? What is the Virgo cluster and what galaxy lies at its center? What are giant elliptical galaxies?
7. Describe the observational characteristics of irregular galaxies.
8. Which satellite galaxies are thought to give rise to the Milky Way's spiral structure? How do they do this?
9. What is meant by galactic cannibalism? What type of galaxy is likely to be such a cannibal and where would it likely be found?
10. Describe the evolutionary model of a radio galaxy. Compare and contrast radio galaxies, Seyfert galaxies, and quasars. What is meant by the Local Hypothesis? What do we think is the power source of active galaxies?
11. What is Olber's paradox? How is it rectified?
12. What is the Big Bang Theory and what is the best observational evidence of this theory? What are the 2 postulates of the cosmological principle? Describe how the microwave background radiation was discovered. What 2 key findings did COBE make about this radiation? What 3 key findings did WMAP make about this radiation?
13. What are the names of the scientists that discovered the cosmic microwave background radiation of the Big Bang? What did they win as a result of this? What type of spectrum does this background radiation have?
14. What are the 3 possible structures that the Universe can have and how can the current density of the Universe be used to determine which structure the Universe has? What is meant by deceleration parameter and density parameter?

15. Describe the **cosmological constant**. Why did Einstein introduce it into his field equations?
16. What are the 4 forces that currently exist in the Universe? What is the difference between elementary and field particles? Define hadrons, leptons, mesons, baryons, gluons, photons, weakons (also called intermediate vector bosons), and gravitons. What is the difference between fermions and bosons and which one obeys the Pauli Exclusion Principle? What are quarks?
17. What happen during the Inflationary Era of the Universe and what caused it? What happened during the Nucleosynthesis Era of the Universe? Why was the Universe opaque to the flow of photons during the Radiation Era and what happened during the Matter Era that allowed the Universe to become transparent? How is this related to the 3 K background radiation?
18. What element is life on Earth based upon? What are the differences between cells, proteins, and amino acids? What is DNA? Describe 4 locations in the Universe where amino acids have been seen.
19. What is the Miller Experiment and why is it important?
20. What is exobiology and SETI? Describe various experiments to detect life in the solar system. What is Drake's Equation? What is a life (or habitable) zone?
21. What wavelengths in the radio spectrum are the place to look for signals from extraterrestrials? What is this spectral region called?
22. What steps were taken on both the Pioneers 10 and 11 and Voyagers 1 and 2 spacecrafts in case they happen across extraterrestrials as they go out into the Galaxy?
23. What is the **panspermia hypothesis**? What is meant by the **Cambrian explosion**?