

Homework #8

Name: [Leslie Looney \(Preview\)](#)

Number of Questions: 20

Finish

Help

Question 1: (5 points)

The Miller-Urey “experiment” consisted of

- 1. sending a coded message via radio toward nearby stars that are similar to the Sun and may have planets.
- 2. passing an electrical arc through a mixture of hydrogen, ammonia, methane, and water and looking for resulting organic compounds.
- 3. attaching a metal plaque to the Voyager spacecraft to tell extraterrestrial beings about us, should they ever recover the spacecraft.
- 4. monitoring tens of millions of radio frequencies at once in an effort to detect extraterrestrial radio communications.

Save answer

Question 2: (5 points)

The Drake equation attempts to predict

- 1. the number of inhabitable planets around stars in our Galaxy.
- 2. the number of intelligent civilizations that exist in the whole universe.
- 3. the probability of primitive life existing elsewhere in our Galaxy.
- 4. the number of technically advanced civilizations in our Galaxy.

Save answer

Question 3: (5 points)

Which of the following events of the past century do you think will have announced our presence upon Earth most effectively to extraterrestrial watchers?

- 1. The slow build-up of radio transmissions after the invention of radio, with modulated signals carrying sound and visual television images.
- 2. The appearance of artificial satellites orbiting Earth, after 1957.

- 3. Nuclear weapons explosions, producing extremely intense but brief flashes of light and electromagnetic radiation.
- 4. Slow changes in vegetation patterns and the appearance of manmade structures such as road systems and cities upon Earth.

Save answer

Question 4: (5 points)

Why didn't Leslie spend more time explaining the various extraterrestrial races?

- 1. The government cover-up has reached even our poor little Professor.
- 2. Aside from a few alien visitors, most species don't stay long on Earth. Those that do, won't allow scientist to touch them.
- 3. There has been no scientific proof of any alien visitation.
- 4. Most aliens live and work in NYC or LA and have bodyguards.

Save answer

Question 5: (5 points)

Which of the following ideas has been borne out by actual astronomical observations over the past few centuries?

- 1. The probability of life existing elsewhere in the universe, even elsewhere in our own solar system, is extremely great.
- 2. We appear to occupy a unique position in the universe, unrepeated anywhere, since our Sun is unique in properties and position in a remarkable galaxy.
- 3. All the observational evidence so far suggests that conditions for the evolution of life exist only on our Earth, in its position near to our Sun.
- 4. Our Sun is an unremarkable star in a commonplace galaxy, and many similar stars exist in the universe around which life might evolve on planets.

Save answer

Question 6: (5 points)

Determination of the distance to the Andromeda “nebula” (which finally resolved the Curtis-Shapley debate on the nature of “spiral nebulae”) was carried out by Hubble by observing

- 1. pulsars.

- 2. Cepheid variable stars.
- 3. the Doppler shift of stars in the nebula.
- 4. the Main Sequence of stars in the “nebula.”

Save answer

Question 7: (5 points)

What is it that makes the study of the structure of our own Galaxy more difficult than that of much more distant spiral galaxies?

- 1. The galactic center is visible only from the southern hemisphere, where, until recently, no major telescopes were available for the study of galactic structure.
- 2. Our Galaxy is too close, such that photographs or images cannot be taken of the whole Galaxy at any one time.
- 3. Most of our galaxy is hidden behind dense gas and dust clouds in the galactic plane.
- 4. Our star is within the Galaxy and its motion confuses the interpretation of the motion of other parts of the Galaxy.

Save answer

Question 8: (5 points)

The factor that misled Herschel into concluding that the stars of the Milky Way were distributed with the Sun at the center of the Galaxy was

- 1. hot hydrogen gas in the Galaxy, its emission hiding the more distant stars.
- 2. interstellar dust, which obscured the more distant stars and thereby localized his observations.
- 3. gravitational bending of light by the mass of the Galaxy, distorting the relative positions of the stars.
- 4. that most of the “stars” he measured were in fact distant galaxies that are distributed uniformly around the Sun.

Save answer

Question 9: (5 points)

The spiral-arm structure of the Milky Way Galaxy has been measured and evaluated most effectively by observations of

- 1. globular clusters in the halo of the Galaxy.
- 2. Balmer emission lines of visible radiation from hydrogen.
- 3. 21-cm radiation from interstellar hydrogen and the distribution of young stars.
- 4. Lyman UV radiation from hot hydrogen gas.

Save answer

Question 10: (5 points)

Which of the following components of the Galaxy best outline the spiral arms of the Galaxy?

- 1. Young O and B stars, dust, and gas.
- 2. Globular clusters.
- 3. Predominantly solar-type stars.
- 4. White dwarf stars.

Save answer

Question 11: (5 points)

What would you expect to be the overall color of a globular cluster of stars, and why?

- 1. Blue, because of the contribution from young and very hot stars in the cluster.
- 2. Red, because of the emission of light by the hydrogen gas in H II regions surrounding the stars in the cluster.
- 3. Red, because of the older population of stars in the cluster.
- 4. Blue, because of the scattering of starlight from the dust surrounding the stars in the cluster.

Save answer

Question 12: (5 points)

The Milky Way is an example of which type of galaxy?

- 1. Spiral.
- 2. Irregular.
- 3. Lenticular, S0 type.
- 4. Elliptical.

Save answer

Question 13: (5 points)

Which of the following statements correctly describes the rotation of our Galaxy?

- 1. The disk rotates like a solid object (objects at all distances take the same time to complete an orbit), and the halo objects have random orbits with no net rotation of the halo about the center of the Galaxy.
- 2. Objects in the disk have random orbits with no net rotation of the disk about the center of the Galaxy, and the halo rotates differentially (objects further from the center take longer to complete an orbit than objects closer to the center).
- 3. The disk rotates differentially (objects further from the center take longer to complete an orbit than objects closer to the center), and the halo rotates differentially (objects further from the center take longer to complete an orbit than objects closer to the center).
- 4. The disk rotates differentially (objects further from the center take longer to complete an orbit than objects closer to the center), and the halo objects have random orbits with no net rotation of the halo about the center of the Galaxy.

Save answer

Question 14: (5 points)

Much of the mass of our Galaxy appears to be in the form of “dark” matter of unknown composition. At present, this matter can be detected only because

- 1. it emits synchrotron radiation at radio wavelengths.
- 2. its gravitational pull affects orbital motions in the Galaxy.
- 3. it bends light from distant quasars.
- 4. it blocks out the light from distant stars in the plane of our Galaxy.

Save answer

Question 15: (5 points)

What is the Hubble classification for a spiral galaxy with a large nuclear region and tightly wound arms?

- 1. Sb.
- 2. SBc.
- 3. Sc.

4. Sa.

Save answer

Question 16: (5 points)

The Andromeda Galaxy (M31) is best described as

1. a spiral collection of stars, dust, and gas, 200,000 light-years across.
2. an extension of the Milky Way.
3. a vortex surrounding a black hole.
4. a gaseous nebula, extending for 6° across our sky.

Save answer

Question 17: (5 points)

A particular galaxy appears round, with a nuclear region of uniform brightness and an outer region that is broken up into curved but fuzzy and poorly defined lanes of stars and light gas clouds. How would this galaxy be classified?

1. Elliptical.
2. Grand-design spiral.
3. Flocculent spiral.
4. Irregular.

Save answer

Question 18: (5 points)

Elliptical galaxies look far less impressive than spiral galaxies because

1. they contain far fewer stars.
2. there are none within our Local Group, so the only elliptical galaxies we see are at a very large distances from us.
3. they contain no gas and dust clouds or young, hot stars.
4. they are always smaller.

Save answer

Question 19: (5 points)

In which direction do galaxies evolve on the Hubble “tuning-fork” classification scheme and what is the evolutionary significance of the diagram?

- 1. There is none—present evidence suggests that galaxies do not evolve from one kind to another.
- 2. The “young” irregular and lenticular galaxies in the center of the “tuning fork” evolve to either elliptical galaxies if the material is metal-poor or spiral galaxies if the material is metal-rich.
- 3. Stars slowly die and the spiral arms slowly spin up and tighten to transform spiral galaxies into elliptical galaxies.
- 4. Elliptical galaxies slowly condense and spin up to form spiral galaxies, the increasing stellar collisions forming the interstellar material in the spiral arms.

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Question 20: (5 points)

Galaxies in the universe are

- 1. distributed randomly, their density remaining approximately constant throughout space.
- 2. collected into superclusters that are concentrated along surfaces surrounding empty spaces that contain very few galaxies.
- 3. concentrated into a central supercluster with other clusters rotating about it in a huge, flat disk like a supergalaxy, with very few galaxies outside of this disk.
- 4. all concentrated in spherical clusters, and these clusters are distributed uniformly throughout space.

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Finish

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