

Crowdclass Supplemental Materials

Fact-based questions

1) The first, widely-used galaxy morphology classification scheme was developed by:

- (*) Edwin Hubble
- Stephen Hawking
- Arthur Eddington
- Edmond Halley
- I don't know

2) Which of the following statement about elliptical galaxies is true?

- Ellipticals are made of young, blue stars.
- (*) Ellipticals are galaxies that lost their structures through collisions with other galaxies.
- Ellipticals are made of very round stars that tend to cluster together to form round shapes.
- Ellipticals galaxies have high rates of star formation.
- I don't know.

3) Which of the following statement about galaxy mergers is true?

- When galaxies merge, most of the stars within a galaxy collide with stars from the other galaxy.
- Galaxy collisions are rare events that don't happen very frequently throughout the universe's history.
- Since galaxies are so large, collisions with other galaxies have very little influence on its shape and features.
- (*) When galaxies merge, the turbulent gas inflowing into the interaction region injects extra energy goes into triggering new stars to form.
- I don't know

4) Which of the following statement about tidal debris is true?

- Tidal debris is due to the highly active active-galactic centers that ejects out the unnecessary dust and gas that the galaxy does not need to survive.
- The name "tidal debris" comes from the fact that stellar interactions within a galaxy produce irregular, often tail-like, structure that often look like ocean waves and tides.
- (*) When galaxies come too close to one another, their gravitational forces on each other deflects the individual trajectories of each star in a dynamical process called "relaxation".
- In a tidal interaction, we see that stars in a galaxies continue to smoothly orbit around the center of the galaxy without any disruption. I don't know.

5) A gravitational lens is :

- a galaxy that have a intrinsic lens-shape that resulting from the collision with another galaxy.
- a galaxy that have a intrinsic lens-shape that resulting stellar nucleosynthesis of the host stars.
- a phenomenon that results from Earth's gravitational forces distorts the lens of the telescope.
- (*) a phenomenon that results from light being bent after passes through a massive object foreground object.
- I don't know.

6) Dust lane :

- (*) contains dark streak seen near the disk of the galaxy of cold molecular gas.
- contains bright streaks seen near the disk of the galaxy of hot atomic gas.
- is a phenomenon that results from the formation of dust stripes across the telescope lens.
- is a phenomenon that results from light passing through the dusty regions of the Earth's atmosphere.
- I don't know.

Hybrid questions

7) Which of the following statement about spiral galaxies is NOT true?

- Spiral arms contain lots of gas and dust to fuel the formation of young, blue, new stars.
- The central bulges of spiral galaxies are mostly made of old, red stars.
- (*) Spiral arms are static structures that are intrinsically fixed to the galactic structure.
- When a galaxy is viewed edge-on, it can be hard to tell whether the galaxy is spiral or not.
- I don't know.

8) Which of the following property of galactic bulges is true?

- Galactic bulges is not intrinsic to spiral galaxies. They are an image artifact from observing a round galaxy overlapping with the elliptical galaxy in the background.
- (*) Central bulges of spiral galaxies are made of lots of old, red, metal-poor stars that orbits around the galactic core.
- A possible explanation for the galactic bulges is that they are due to galaxy mergers in which the larger host galaxy incorporates a small round elliptical galaxy to its center after the collision occurs.
- There is a correlation between the size of galactic bulges and the color of the galaxy.
- I don't know.

9) Which of the following statement regarding galaxy morphology and their associated properties is true?

- Sprial galaxies are formed by collisions of many galaxies.
- (*) Tidal debris results from the differential force between one part of the galaxy and another part of the galaxy.
- Spiral arms of galaxies contain old, red stars that are undergoing very little star formation activity.
- We can identify the shape of a galaxy based on the spectra data at different wavelengths.
- I don't know.

10) Which of the following topics is NOT an example of something that scientists can learn by studying galaxy morphology (shapes + color)?

- The level of star formation activity in the galaxy.
- (*) The relative number of gravitationally lensed objects in this galaxy.
- The stage that the galaxy is in its formation history.
- The chemical compositions of the stars in the galaxy (metal-rich or metal poor).
- I don't know.