



Daily Article (Bharath's Reading list) - Answers and Explanations 07.11.2023

Article link : [Link](#) (The Milky Way May Be Missing a Trillion Suns' Worth of Mass)

1. The decline in the speeds of stars at the outskirts of our galaxy "flies in the face of all expectations" as:

- A. Barring a few minor deviations, plots of stellar orbits in other galaxies consistently show stars from center to rim all whirling with similar speed, and not showing any Keplerian decline
- B. It is a basic tenet of cosmology that the Milky Way is the same as all other galaxies and there's nothing special about any particular place in the universe
- C. The finding implies the dark-to-ordinary matter ratio is just 2.3 to 1 in the Milky Way, which is far less than the 10:1 ratio found in galaxies of similar size
- D. All the above

Explanation : D

All given points are mentioned in the article

2. Which of the following is NOT a line of argument that Lina Necib offers to support view that while the decline in the speeds of stars at the outskirts of our galaxy may be genuine but not representative of our galaxy as a whole?

- A. Estimates of our galaxy's mass provided by stellar streams line up with the weightier approximations of Milky Way
- B. Different teams may be inadvertently misinterpreting their data as all polts are based on certain assumptions that affect the results
- C. The orbiting speed of the Large Magellanic Cloud, a satellite galaxy that orbits our own, is consistent with standard dark matter models
- D. Data from facilities such as the Vera C. Rubin Observatory shows that there are some stars

outer parts of the Milky Way that are travelling in the same speed as similarly situated stars in other galaxies

Explanation: D

All options except D are true. Option D is incorrect as the article only says, 'Future data from facilities such as the Vera C. Rubin Observatory (originally called the Large Synoptic Survey Telescope and renamed in 2019) will hopefully be able to find stars in the outer parts of the Milky Way that can help settle the debate.'

3. Stellar speeds offer a way to weigh a galaxy as:

- A. Invisible dark matter in galaxies tugs on the far-out stars to boost their speeds
- B. The gravitational force each particular star feels depends on the galaxy's total mass
- C. Stellar-speed measurements can be measured accurately by the unrivaled 3-D information Gaia provides
- D. All the above

Explanation: B

Option B is clearly stated in the article. Options A and C are irrelevant.