

QUESTIONS FOR UNDERSTANDING – 1929 Cosmic Times

Throughout these articles, what term is used in place of the term *galaxies*?

Andromeda Galaxy Lies Outside the Milky Way

1. Before Dr. Hubble made his discovery about the Andromeda Galaxy, how many galaxies do you think scientists thought there were? EXPLAIN your answer.
2. What types of stars did Hubble find in the Andromeda Galaxy that allowed him to calculate its distance?
3. Briefly discuss how those stars are used to calculate distance in space.
4. Who was the first person to recognize the importance of Cepheid variable stars?

Universe is Expanding

1. Using the 100-inch Hooker Telescope, Hubble discovered two things that prove the universe is expanding. Describe those discoveries.
2. *What* did Hubble and his colleague Humason study to learn the speed and motion of the spiral nebulae?
3. Which statement is correct?
 - Space is infinite and the spiral nebulae move through it.
 - Space is shrinking and pulls the spiral nebulae along with it.
 - The Milky Way is expanding.
 - Space expands and pulls the spiral nebulae along with it.
4. Before 1929 a famous scientist developed a very famous theory that predicted the Universe should expand. Who was the scientist *and* what was the name of the theory?
5. In 1927, how did A.G. Lemaitre describe the Universe?

Of what famous theory about the origin of the Universe does his description remind you?

"Great Debate" Resolved

1. A famous debate was held in 1920 between two astronomers: Shapley and Curtis. These gentlemen had very different ideas about the true nature of the Universe. Hubble's discoveries supported one of them. Which one?

Classifying Nebulae

1. Name the three types of nebulae.
2. Who classified and named the different types of nebulae?

The Minds atop Mt. Wilson

1. Milton Humason did not have the benefit of a college education to advance his career in astronomy. However, he was intelligent and demonstrated another very important quality that allowed him to achieve and succeed along with other highly educated astronomers. What was this other quality?