

QUESTIONS FOR UNDERSTANDING – 2006 Cosmic Times

Faster Walk on the Dark Side

1. As of now, what two things are known about “dark energy?”
2. In 2006, what were the three teams of scientists studying when they found evidence of dark energy?
3. In 1998, what did two teams of astronomers discover about the rate of expansion of the Universe?
4. How does dark energy work to make the Universe expand faster?

Journey to Cosmos Dark Heart

1. What is the goal of the Joint Dark Energy Mission (JDEM)?
2. When the distance to Type 1a supernovae is more accurately measured, what will this provide clues to?
3. What are the names of the three programs that are a part of JDEM *and* what part(s) of the electromagnetic radiation spectrum will each program study?

Sorting Out Dark Stuff

1. Based on the most recent evidence collected by astronomers, describe the composition of the Universe.
2. Which statement is true? Dark matter ...
 - only affects other matter by tugging on it with gravity.
 - is normal matter that is too cool to give off visible light.
 - is composed of a new type of massive particle that has been isolated and studied in laboratories.
 - is the same thing as dark energy
3. What evidence do astronomers have for the existence of dark energy?

Seeds of Modern Universe

1. What has the Wilkinson Microwave Anisotropy Probe (WMAP) provided a clearer view of?
2. What information has WMAP provided about the geometry of the universe and what does this mean?
3. WMAP also discovered polarization of light in the Cosmic Microwave Background (CMB) radiation. What does this help us understand?
4. What are the seeds of the gigantic clusters of galaxies found today?

Biggest Mystery: What is Dark Energy?

1. There are several theories that attempt to explain what dark energy is. Those theories have not yet been tested.

What is needed before those theories can be tested?

2. What does dark energy do?
3. What is the modern theory of quintessence and why might it explain dark energy?

First Light Wins Nobel

1. Name the individuals who received the 2006 Nobel Prize in physics.
2. What was the discovery they received the prize for, and when did they discover it?
3. What did they learn from data from COBE?
4. If they had not found slight variations in the CMB, what would have been difficult to explain?