

What You Should Know from “The Big Bang video”!

- 1.) How old is the universe?
- 2.) What is the Big Bang?
- 3.) When were the hydrogen atoms in water created?
- 4.) What was Hubble credited for doing in 1929? (And according to 13 Things That Don't Make Sense, was the credit justified? Explain.)
- 5.) What are you seeing when you look up at the stars of the night sky?
- 6.) Where did the Big Bang take place?
- 7.) Out of what was the Big Bang created?
- 8.) How many galaxies are there in the known universe?

- 9.) At the Big Bang, all the forces and laws of physics began to take shape. What was the first force to emerge?
- 10.) If gravity had been too big, what would we have ended up with?
- 11.) After gravity emerged, a shock wave motivated the universe to expand at incredible speeds. We think that in less than a millionth of a millionth of a millionth of a millionth of a second, we think space expanded by a factor of greater than a million, million, million, million times? What is that kind of expansion called?
- 12.) During inflation, the universe expanded from the size of an atom to the size of a baseball? That would be like a golf ball expanding to the size of what?
- 13.) What is a Planck time? (approx. a billion, billion, billion, billion, billionth of a second– this is 5×10^{-44} seconds, or 10^{-43} seconds rounded off)
- 14.) As the super hot universe began to cool with expansion, what happened and what was the mechanism for this happening?
- 15.) Where did antimatter come from?
- 16.) In the earliest moments of the Big Bang, was the matter created stable? Explain.

17.) In the early stages, particles were energetic and chaotic and easily changed back into pure energy. As the universe cooled, they stopped doing that. Why?

18.) At the point alluded to in #17, what kind of particles populated the universe?

19.) All the matter that will ever be was created from where?

20.) What is CERN?

21.) What is CERN's diameter?

22.) How big is CERN's detector? (5 stories tall and weighs over 7000 tons—the weight of the Eiffel Tower)

23.) Why didn't antimatter cancel out all the matter of the universe?

24.) For every billion particles of antimatter, how many particles of matter existed? That surviving matter became what?

25.) Given what you know about antimatter, what are we, really?

- 26.) When the universe was a second old, it cooled substantially and began to do what?
- 27.) What were the first nuclei created?
- 28.) What were the second and third nuclei types created?
- 29.) In the first three minutes, we went from an infinitesimally small universe to one that was how big?
- 30.) What happened 380,000 years after the Big Bang?
- 31.) What was the cause of the situation outlined in #30?
- 32.) What is needed for actual atoms to be formed?
- 33.) What was the consequence of the event that happened at the 380,000 year mark?
- 34.) What did scientists in New Jersey pick up in the 1940's?

35.) What did the COBE satellite do?

36.) Approximately how long did it take for the first stars to form? (2,400,000 yrs)

37.) What was the universe like before the first stars? What was it like after?

38.) When did the first galaxy form?

39.) Approximately how old is our star?

40.) How big is space, as best we can tell? (at least 150 billion Light Years across)

41.) How is the universe shaped?

42.) Our universe seems to be in a runaway mode (we are experiencing inflation). What is causing this (as best we know)?

43.) How will the universe end?