Questions for study IX

(be prepared to discuss Thursday, June 1, and turn in these questions thereafter)

Davies, The Last Three Minutes

1. (page 128) The light cone shows up again: here, only half of the double-sided cone I drew in class is depicted. Davies calls this the “past light cone” because it shows the shaded area of events in the past that are possible to know. In the caption, he states “an apocalyptic event outside the past light cone might be sending disastrous influences (wavy line) racing toward Earth, but the observer would be blissfully unaware of this until the influences arrived.” Recalled I mentioned a tachyon, a theoretical faster-than-light particle. Suppose tachyon bullets were invented. How could you defend yourself against being shot by a tachyon bullet?

2. (page 132) The idea of a false vacuum state shows up again. What prevents you from suddenly experiencing massive (and fatal) quantum tunneling, leaving you suddenly embedded in the ground? However, are there inventions around today that rely on quantum tunneling? If so, name one.

3. (pages 134 and 135) To bring the course ‘round full circle, is it possible that human actions will precipitate a “scientific apocalypse”? By this I don’t mean nuclear war or any such trivial thing; I mean the whole universe ends due to our actions! Briefly summarize the argument on these pages for a human-initiated apocalypse.

4. (pages 135 to 138) Yet in the apocalypse of the previous question may lie our salvation. What is a “baby universe”? What do wormholes have to do with these “baby universes”? And how is this an escape route from the apocalypse? Incidentally, you can tell this book was written by a citizen of the UK; check out the Dr. Who reference on page 136.

5. (page 138) Paranoia abounds. If the theory about baby universes proves true, then what is suggested about the origin of our own universe and the Big Bang? “He was part of my dream, of course — but then I was part of his dream, too!” Lewis Carroll, Through the Looking Glass

6. (pages 142 to 145) Last question: Give two reasons why the cyclic universe of alternating Big Bangs and Big Crunches is unlikely as a plausible scientific model (apologies to those of you who really wanted this scenario to be true).