

Study Goals for Major Question 1

What is the nature of space and time? (Chapter 2 in the text plus material covered in class plus assigned readings.)

By the end of our discussion of Major Question 1, you should know or be able to do the following.

- Be familiar with Newton's Laws of Motion and be able to give an illustration of each one.
- Know the important differences between the classical (Newtonian) concept of space and time and the modern concept of *spacetime*, as described by Einstein.
- Know the importance of the speed of light and its role in Einstein's theories.
- Know the difference between Newton's concept of gravity and Einstein's concept of gravity and why even Einstein's concept of gravity may not be completely correct.
- Be familiar with the concepts of Special Relativity and General Relativity, as they pertain to the possibility of time travel.
- Know some of the properties of a black hole and what distinguishes a black hole from a wormhole.
- Be familiar with some of Einstein's predictions concerning the distortion of *spacetime*, such as gravitational waves and the hypothetical possibility of space travel by *warp drive*.
- Be familiar with the so-called multiverse hypothesis and why it may be difficult, if not impossible ever to know if other universes actually exist.