

HON 494
The Higgs, Quarks and the Big Bang
Textbook Reading Guide

The following four books are required reading for this course:

1. Steven Weinberg, "The First Three Minutes", updated edition, 1993.
2. Sean Carroll, "The Particle at the End of the Universe", 2012.
3. Richard Panek, "The 4% Universe", 2011
4. Lisa Randall, "Warped Passages", 2005

These are all expository books, written for the lay person. That is, they don't require a background in physics and they use very little mathematics. But that is not to say that the reader need not bring some effort to the enterprise.

These books are not text books in the usual sense. In this course, they are supplementary and complementary to the matter to be discussed in class. Since the order in which topics will be taken up in class does not coincide neatly with that in any of these books, it is not possible to provide a coordinated reading schedule. The best advice is to read them all as soon as you can, in whatever order you wish, but if you read them serially, I would suggest the order given above. However, you may wish to read them in parallel to each other. In order to assist you in your reading decisions, I provide the following tentative schedule of topics, with a listing of the chapters you should have read by the given date. Note: There will be one non optional essay question specific to each book on the final examination.

Date	Topic	Weinberg	Carroll	Panek	Randall
1-14	Elementary Particles				
1-16	Photons				
1-21	Special Relativity				
1-23	More Elementary Particles				
1-28	Antimatter				
1-30	Neutrinos				
2-04	General Relativity		Chaps. 1 - 5		
2-06	General Relativity	Chaps. 1-2		Chapter 1	Chaps. 1-5
2-11	Expansion of the Universe				
2-13	Expansion of the Universe				
2-18	Particles Standard Model				Chaps. 1-9
2-20	Early Big Bang Model				
2-25	Modern Astronomy				
2-27	Modern Astronomy				
3-04	Black Body Radiation	Chaps. 1-8			
3-06	Cosmic Microwave Background				
3-18	WMAP			Chaps. 1-9	
3-20	The Standard Big Bang Model				
3-25	Cosmic Structure				
4-01	Evidence for the Big Bang Model			Chaps 1-12	
4-03	Dark Matter				
4-08	Dark Energy				
4-10	Symmetry Breaking: the Higgs		Chaps. 1 - 11		
4-15	Colliders and the LHC				
4-17	Finding the Higgs				
4-22	Supersymmetry				Chaps. 1-13
4-24	String Theory and Branes				
4-29	Multiple Universes		Chaps. 1-13		Chaps. 1-25
5-02	Wrap up	Complete	Complete	Complete	Complete

