CHAPTER 3: STATISTICAL MECHANICS

Reading:

Sections 3.1–3.7 of Blandford and Thorne Section 3.8 can be regarded as of cultural interest and reading it is optional, but it may be useful since it illustrates a number of the principles developed in Secs. 3.1–3.7. Chapter 3 is available at http://www.pma.caltech.edu/Courses/ph136/ph136.html

As usual, most of the applications are in Example Exercises. You should read these examples whether or not you attempt to solve them.

TA:

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Problems

NOTE: For students who have had enough prior experience with statistical mechanics that some or all of the problems assigned below are not a useful learning experience: Do **not** waste your time working such problems. Instead, (i) pick other problem(s) that are useful for you, or (ii) read Sec. 3.8 and make up your own calculations relevant to that material (e.g., try to derive some of the things asserted therein).

A. Exercise 3.2 (Derivation of the Bose-Einstein and Fermi-Dirac Distributions).
B. *Either* Exercise 3.3 (Estimating entropy) *or* Exercise 3.4 (Additivity of entropy).
C. Exercise 3.9 (primordial element formation)
D. Exercise 3.6 (grand canonical ensemble for a monatomic gas)
E. Exercise 3.7 (probability distribution for the number of particles in a cell)