## PHY 3513 Fall 2000 - Homework 6

## Due at the start of class on Friday, October 27.

Answer all questions. To obtain full credit, you must explain your reasoning and show all working. Please write neatly and include your name on the front page of your answers.

- 1. Callen Problem 3.5-1.
- 2. Callen Problem 3.5-4.

A little care is required when taking the limit  $a, b \longrightarrow 0$ . Follow the hint given in the problem to simplify  $\Delta U$  and W for small a and b; only then should you take the van der Waals coefficients to zero.

3. Callen Problems 3.6-2 and 3.6-3. These two problems enable you to compare the relative contributions of matter and radiation to the pressure and energy density in intergalactic space.

You should treat the matter as a non-relativistic, simple ideal gas.

4. Callen Problem 3.7-3.