Physics 224 | **Fall 1999**

Phenomenology | **due 11:00 am Thursday Nov. 2**

PROBLEM SET 5

Oct. 28 Colloquium: "Imaging the Dramatic Disks of Young Stars"

Professor Alycia Weinberger, UCLA

3:30 pm, 101 Rowland Hall

1. What will your final report be on? To find possible topics, look at *More Things in Heaven and Earth: A Celebration of Physics at the Millennium*, *The New Physics*, or Scientific American. Write your answer on a separate sheet of paper.

2. In the transition $^{10}H_{3/2} - {}^{10}G_{1/2}$, how many lines will appear in the Zeeman pattern? Explain your reasoning by listing the allowed transitions.

3. Eisberg and Resnick problem 12.21.

4. Eisberg and Resnick problem 12.22(a).

5. How does the transition temperature T_C depend on the number of particles N if E=pc for Bose condensation? (Hint:You don't have to evaluate any integrals. Just try scaling, i.e., make the variables in the integral dimensionless. Your answer should be of the form $T_C \sim N^{\alpha}$. Find α.)