Physics 3201
Problem Set 12

Due: Thursday, November 21. Solutions will be posted at mid-day on Friday, Nov. 22.

Notes: This problem set covers Sections 4.4, 5.1, and 5.2 of Griffiths. You should read all of Chapter 5.

1. An 8.5" × 11" sheet of paper with a thickness of 100 μm is initially oriented parallel to a uniform external electric field of 1000 V/m. Its dielectric constant is 2.5. Calculate the approximate amount of work needed to turn the paper so that it is oriented perpendicular to the field. *Hint*: Use the continuity conditions on **D** and **E** to find the fields for each orientation, then calculate the energy in the field within the volume of the paper.)

2. Griffiths Problem 4.28 (in both editions)

3. Problem 5.3 (easy, principle is important).

4. Problem 5.6 (also easy).

5. Problem 5.9

6. Problem 5.12 (new in 4th Ed.)

Honors: Problem 4.43 (4.40 in 3rd Ed.). The next meeting of honors students will be on Nov. 22, at 1:30 PM in room P302S.