The midterm will be Monday, October 22, 7-830 PM in G-130.

“The best discoveries always seem to be made in the small hours of the morning, when most people are asleep, where there are no disturbances and the mind becomes most contemplative. You’re out in a lonely spot somewhere, looking at the numbers on reams of paper spewing out of a computer. You look and look, and suddenly you see some numbers that aren’t like the rest – a spike in the data. You apply some statistical tests and look for errors but no matter what you do, the spike’s still there. It’s real. You’ve found something. There’s just no feeling like it in the world.” (Leon Lederman, 1922-2018)

1) Jackson 4.9. [20 points] (a)–10 points, (b)–4 points, (c)–6 points.

2) Jackson 4.13 [15 points]

3) Jackson 4.10 [10 points].

4) [15 points] A sphere of radius $R$ is made of a uniaxial dielectric with dielectric constant $\epsilon_1$ along two principal axes and dielectric constant $\epsilon_3$ along the third. The sphere is placed in a uniform electric field, with arbitrary orientation. Find the torque on the sphere.