For Monday 10/29, read Griffiths' section 4.2 and Q9 and turn in by 9:30 am:

1. Conceptual: What do ρ and ρ_0 stand for? Don't just give an equation. What are they, physically? What units do they have?
2. Easy Math: Show that $u(\rho)=C\rho^{l+1}+D\rho^{-l}$ satisfies $\frac{d^2u}{d\rho^2}=\frac{l(l+1)}{\rho^2}u$.
3. Easy Math: Explicitly plug in constants to derive numbers in equations 4.72 and 4.77. Show explicitly that the units work.
4. Easy math: Calculate the Rydberg constant. Be explicit, especially with units.
5. Conceptual: What is the wavelength of Hydrogen-alpha? (Hints: In the visible, ask Ben and Erik about it). What is the transition that produces this wavelength?
6. Math: Griffiths 4.11
7. Math: Griffiths: 4.13

For Wednesday 10/31, read Griffiths' section 4.3 and turn in by 9:30 am:

1. Conceptual: Work out the canonical commutation relations for the components of r and p (eq 4.10). Actually, you can explain instead of doing the math, if you want.
2. Conceptual: Prove the following commutator identity: [AB,C]=A[B,C]+[A,C]B.
3. Conceptual: Why does $[yp_z,x\_p_z]=0$? Explain. Why does $[yp_z,zp_x]=yp_x[p_z,z]$? Why can *y* and p_x come out of the commutator?
4. Conceptual: For each equation from 4.103 through 4.118, write down whether that equation is: A result of something earlier (if so, state what), or an assumption, or a guess he's trying to prove. Which of these equations proves that $L_{\pm}$ are ladder operators?
   Example: 4.103 is a direct result of the definition of the *r* and *p* operators.
5. Math: Griffiths problem 4.19
6. Fill in Math: Griffiths 4.21
7. Conceptual: Griffiths 4.22 (a) only
8. Math: Griffiths: 4.23

"For realz" weekly homework due 9:30 am on Friday 11/2 is math problems from 10/26, 10/29 and 10/31.

For Friday 11/2, read Griffiths section 4.4.1 and Q5.5 (4.4.2 explains the Stern-Gerlach experiment and is optional) and turn in by 9:30 am:

1. Conceptual: Find the eigenvectors in Table Q6.1 in Griffiths. Give equation numbers.
2. Conceptual: Q5S.3 AND Q5R.1
3. Easy math: Using the eigenvectors in Table Q6.1,
   a. Calculate the probability of measuring up and down in an SGy device if the particles entering the device are in |+x>.
   b. Calculate the probability of measuring up and down in an SGθ device if the particles entering the device are in |+y>.
4. Math: Griffiths 4.27
5. Math: Griffiths 4.31