

QUANTUM PHYSICS II
PROBLEM SET 6
due October 10, before class

A. Two fermions in a well

Consider two identical spin-1/2 fermions in an external harmonic oscillator potential. There is no interaction between the fermions. Write down the eigenstates of the energy for the first three lowest energy states. Make sure you include all states with the same energy.

B. White Dwarfs

Solve problems 5.31 and 5.32. For added cultural context you may want to read about how Chandrasekhar discovered (at age 19!) the effect of the Pauli principle to the final fate of stars during a long ship trip from India to England (for instance, at <http://www.asianage.com/columnists/small-controversy-stellar-credit-655>). Also, if you go outside and look for the brightest star in the sky you'll see Sirius. Sirius is actually a binary star. The smaller one, Sirius B, was the first star known to be a white dwarf.
