Physics 113 Quantum Theory Seminar

Assignment 9 March 14,March 15, 2011

This week we study 2- and 3-dimensional systems

Part 1: Readings

Zettili - Chapter 6 Pages 333-368

Boccio - Chapter 9(Pages 743-787 Section 9.6).

All new material.

You must do the readings BEFORE attempting the problems in order to get a good grasp of the overall content of the week's material to be understood. A problem should then make you look more carefully at specific parts of the readings that are necessary for the solution of that particular problem!

Prior to discussing any problems, we will deal with any questions and/or discussion of the readings.

Part 2: Everyone Problems

Everyone must do all of these problems.

Random choice of presenter.

1. Z6-05 - 3D Square well energies and degeneracies
2. Z6-06 - Square well mixed with oscillator
3. Z6-13 - Electron in a hydrogen atom
4. Z6-16 - Hydrogen atom properties (that is L_z in part (d))
5. Boccio 9.7.58 - Electron in Hydrogen p-orbital

Part 3: Extra Problems - Presentations

Each seminar member has responsibility for 2 problem solutions/presentation.

Look at/try to solve other problems besides your own responsibility.

You will not understand other solutions without attempting or at least thinking about the problem before seminar.

Presentation #1 _____

Boccio 9.7.28 - In a coulomb field

Boccio 9.7.35 - Trapped between

Presentation #2 _____

Boccio 9.7.29 - Probabilities

Boccio 9.7.38 - In magnetic and electric fields

Presentation #3 _____

Boccio 9.7.30 - What happens?

Boccio 9.7.39 - Extra(Hidden) Dimensions(Everyone read)

Presentation #4 _____

Boccio 9.7.32 - Exponential potential

Boccio 9.7.40 - Spin?1/2 Particle in a D-State

Presentation #5 _____

Boccio 9.7.33 - Bouncing electron

Boccio 9.7.44 - Crazy potential .....

Presentation #6 _____

Boccio 9.7.34 - Alkali Atoms

Boccio 9.7.54 - Hydrogen d States