Physics 113 Quantum Theory Seminar

Assignment 3 January 31,February 01, 2011

This week we cover the final aspect of probability ideas and then start to think about the quantum formalism.

Part 1: Readings

Zettili: Chapter 3

Sections: 3.1-3.6 (pages 165-183) + relevant solved problems

Boccio - Chapter 5 (Pages 348-357 Sections 5.4, 5.5) ; Chapter 6(Pages 367-394 Sections 6.1-6.8).

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 understand these solutions.

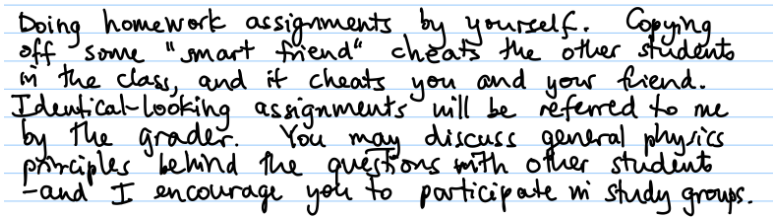
Will be discussed second in seminar.

Random choice of presenter.

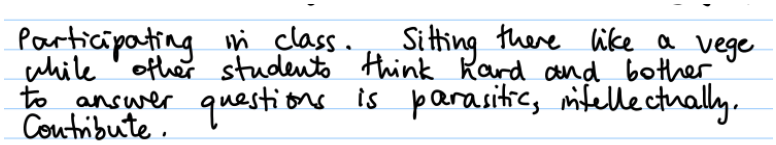
Quality/correctness of presentation = 20% Seminar grade.

1. Zettili 3-16 - Measuring Energy and Other Stuff
2. Zettili 3-17 - Measuring Energies - Use Ket-Bra Method
3. Zettili 3-18 - Measuring Energies - Measuring Two Observables (Drop $\sqrt{2}$ in front of A matrix and normalize the vector)
4. Zettili 3-22 - Energies and Time Evolution
5. Boccio 5.6.9 Bergers Burgers-Maximum Entropy Ideas
6. Boccio 6.19.1 - Can It Be Written?
7. Boccio 6.19.3 - Probabilities

Admonition #1



Admonition #2



Part 3: Extra Problems

Solve as many as you can.

Attempting zero is NOT an option!

Will be discussed third in seminar.

Volunteer presenter. Never volunteering is NOT an option!

Quality/correctness of presentation = 30% Seminar grade.

If a problem is not solved by anyone, then will be done in seminar.

1. Zettili 3-17 - Measuring Energies - Use Density Operator Method
2. Zettili 3-19 - Measuring Energies - Measuring Two Observables (Drop $\sqrt{2}$ in front of A matrix and normalize the vector)
3. Boccio 5.6.10 Extended Menu at Bergers Burgers
4. Boccio 5.6.11 - The Poisson Probability Distribution
5. Boccio 6.19.2 - Pure and Nonpure States
6. Boccio 6.19.4 - Acceptable Density Operators
7. Boccio 6.19.7 - More Density Matrices