Physics 113 Quantum Theory Seminar

Assignment 2 January 24,25, 2011

This week we continue to learn the *mathematical language of quantum mechanics*.

Part 1: Readings

Zettili: Chapter 2

Sections: 2.4.3, 2.4.6-2.4.9, 2.5, 2.6 + relevant solved problems

Boccio - Chapter 4 (Pages 277-316 Sections 4.17-4.21) ; Chapter 5(Pages 338-348 Section 5.3).

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.

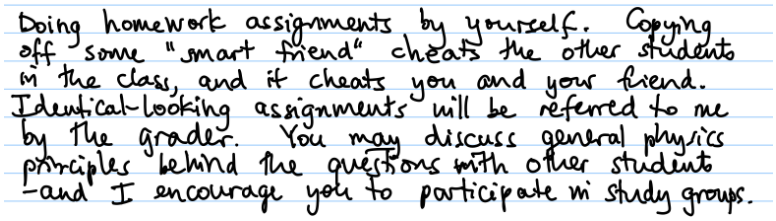
Will be discussed second in seminar.

Random choice of presenter.

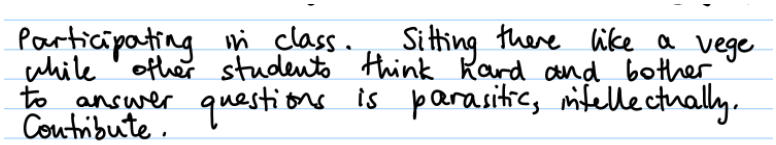
Quality/correctness of presentation = 20% Seminar grade.

1. Zettili 2.23 - Matrices and Projection Operators
2. Zettili 2.49 - An Operator and its Properties
3. Boccio 4.22.14 - Spectral decomposition
4. Boccio 4.22.16 - Expectation Values
5. Boccio 4.22.20 - A 2-Dimensional Hilbert Space
6. Boccio 5.6.2 Playing Cards
7. Boccio 5.6.3 Birthdays
8. Boccio 5.6.6 Bayes

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 2.55 - Permutation Operator
2. Boccio 4.22.18 The World of Hard/Soft Particles
3. Boccio 4.22.19 - Things in Hilbert Space
4. Boccio 4.22.24 Solution Of Coupled Linear ODEs
5. Boccio 4.22.25 - Spectral Decomposition Practice
6. Boccio 4.22.26 - More on Projection Operators
7. Boccio 5.6.7 Psychological Tests
8. Boccio 5.6.8 Bayes Rules, Gaussians and Learning