

Physics 113 Quantum Theory Seminar

Assignment 7 February 28, March 1, 2011

This week we Learn about angular momentum

Part 1: Readings

Zettili - Chapter 5

Boccio - Chapter 9(Pages 691-722 Sections 9.1-9.3).

All new material. You will need to spend a lot of time reading.

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 do all of these problems.

Random choice of presenter.

1. Z5-16 What is happening in this state?
2. Z5-31 Spin 3/2 states
3. Boccio 9.7.2 Operator identities
4. Boccio 9.7.4 On a Circle
5. Boccio 9.7.7 $L = 1$ System
6. Boccio 9.7.12 Simultaneous Measurement

Part 3: Extra Problems - Presentations

One seminar member has overall responsibility for two problem solutions and their presentation in seminar

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

You will not understand other solutions without attempting at least

thinking about the problem before seminar.

Quality/correctness of presentation = part of seminar grade.

Presentation #1 _____

Z5-18 What is happening in this state?

Boccio 9.7.8 A Spin 3/2 Particle

Presentation #2 _____

Z5-32 Spin 5/2 states

Boccio 9.7.9 Arbitrary Directions

Presentation #3 _____

Boccio 9.7.1 Position representation wave function

Boccio 9.7.10 Spin state probabilities

Presentation #4 _____

Boccio 9.7.3 More Operator identities

Boccio 9.7.13 Vector Operator

Presentation #5 _____

Boccio 9.7.5 Rigid rotator

Boccio 9.7.26 Spin 1/2 and Density Matrices

Presentation #6 _____

Boccio 9.7.6 A Wave Function

Boccio 9.7.47 Spin operators ala Dirac

Midterm Problem #4 - Only consult with Professor

Boccio 9.7.11 A spin operator (solution written up in LaTeX)