PHYS 519 A Sp 18: Quantum Mechanics

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MWF 9:30-10:50 PAB: A114

Office hour: Mondays 1-2, PAB B406 and by appointment

TA: Francis Walsh (fwalsh2@uw.edu (mailto:fwalsh2@uw.edu))

TA Office hours: Tuesday afternoon, graduate student lounge, 3-5pm

Welcome to PHYS 519 (Spring 2018). This is the final quarter of the graduate QM sequence. For information about texts, homeworks, exams and grading see COURSE INFORMATION (PHYS 519) (which is also on the "Pages" link). Key facts: HWs will be due on Wednesdays in class; there will no be no final exam but instead two midterms, one midway through the quarter on Monday May 7 so as to avoid conflict with other classes, and the second on the last day of classes, Friday, June 1; there will be no lectures on Wed. May 9 or Friday May 11.

My aim this quarter is to cover Sakurai & Napolitano (SN) Chapters 6-8, with some additional material included as needed. Note that I will not follow SN's development or order precisely.

- Scattering theory (this is a huge subject and will take about 4 weeks)
- QM of multiple identical particles--starting with 2 and going to any number, i.e. ``second quantization''. This will include some discussion of how to describe a Bose-Einstein condensate in an a trap.
- Quantization of the EM field (dipping our toes into Quantum Field Theory)
- Relativistic QM, including an introduction to the Dirac equation

The detailed lecture by lecture coverage will emerge as the quarter progresses---see below. I aim to post detailed lecture notes, which can be accessed from the daily links below, and will usually appear one week at a time.

Course Summary:

Date	Details	
Mon Mar 26, 2018	Lecture: Introduction to class. Introduction to elastic scattering. (https://canvas.uw.edu/calendar?event_id=1113352&include_contexts=course_1133510)	9:30am to 10:50am
Wed Mar 28, 2018	Lecture: deriving differential cross section; optical theorem; partial wave expansion (https://canvas.uw.edu/calendar?event_id=1113362&include_contexts=course_1133510)	9:30am to 10:50am
Fri Mar 30, 2018	Lecture: General properties of scattering amplitude; solving for phase shifts for hard sphere and potential of finite range (https://canvas.uw.edu/calendar?event_id=1113372&include_contexts=course_1133510)	9:30am to 10:50am
Mon Apr 2, 2018	Lecture: Complete hard-sphere scattering; Low-energy scattering	9:30am to 10:50am