PHYS 517 A Au 19: Quantum Mechanics

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Tu Th 9:30-10:50 & F 10:30-11:20 PAB: A114

Office hours: Tu 1:30-2:30pm & Th 12:30-1:30 in PAB B406

TA: Hao Geng (hg666@uw.edu (mailto:hg666@uw.edu)) and Sam Kowash (kowash@uw.edu (mailto:kowash@uw.edu))

TA Office hours: 3-4pm Thursday in B418

Welcome to PHYS 517 (Autumn 2019)! This is the first quarter of the year-long graduate QM sequence. For information about texts, homeworks, exams and grading see Course Information Phys 517 (which is also on the "Pages" link). Key facts: HWs will be due on Fridays at 5pm; there is a single midterm on Tuesday, November 5th in class; the final exam has been officially moved to 10:30-12:20 on Tuesday Dec 10th in our regular lecture room, A114; Friday sessions will be used for HW discussions, problem solving, review for exams and possibly spill-over from the main Tuesday/Thursday lectures; HWs will be due Fridays at 5pm. The only holiday this quarter that occurs during lecture time is Thanksgiving (Thursday/Friday Nov. 28/29th).

My aim this quarter is to cover Sakurai & Napolitano (SN) Chapters 1 & 2, with additional material included as needed. The general topics that I aim to cover are listed below. Note that I will not follow SN's development or order precisely.

- Postulates of QM using Stern-Gerlach experiment and spin as a prototypical example.
- Quantum kinematics: Inner-product spaces; Dirac notation; Operators; Unitary Transformations; Standard measurement theory.
- Continuous various: **x, p** . Wave packets.
- Time evolution; Schrödinger and Heisenberg representations.
- Simple harmonic oscillator. Coherent and squeezed states.
- 1-dim Schrödinger problems, bound and unbound.
- WKB approximation and relation to Hamilton-Jacobi equation in classical mechanics.
- Path integral representation of QM
- Electric and magnetic fields. Gauge invariance and Aharanov-Bohm effect.

The detailed lecture-by-lecture coverage will emerge as the quarter progresses. I plan to post detailed lecture notes before each lecture; these can be accessed from the daily links below.

Code of Conduct (excerpted from Physics Department Code of Conduct (https://phys.washington.edu/code-conduct-uw-department-physics))

> ``Creating a supportive environment to foster academic and scientific progress and ensuring that all members of the department have access to a safe working and learning environment is a collective responsibility. Should unprofessional or inappropriate actions or comments be observed or experienced, direct intervention calling attention to the problematic behavior is often the best response. If that does not feel appropriate or safe, one should contact Physics Student Services, one's supervisor, the Physics Ombud, and/or SafeCampus (https://www.washington.edu/safecampus/) to help determine and effect an appropriate response."