

Quantum Mechanics

Physics 6572

Time: Monday, Wednesday 11:40 am – 12:55 pm

Location: Clark Hall 294D

Lecturer: Kin Fai Mak, 521 Clark Hall, km627@cornell.edu.

Grader: Saswata Roy, sr938@cornell.edu

Content: This is the first quantum mechanics course for graduate students. The following topics will be covered:

- Formalism of QM
- 3D Schrodinger equation, spin and orbital angular momentum. Symmetries and conservation laws. Hydrogen atom.
- Identical particles, exchange force, hydrogen molecule.
- Approximation methods: time-independent and time-dependent perturbation theory, variational principle, WKB approximation.
- Adiabatic processes, Berry's phase, Aharonov-Bohm effect.
- Scattering theory.
- Path integral formulation of QM.
- Quantum entanglement, EPR paradox, Bell's inequality.

Textbook: Sakurai and Napolitano: Modern Quantum Mechanics (2nd edition).

Course requirements: Weekly problem sets due on Wednesdays in class. There will be an evening final exam (exact date to be determined later).

Grades: 50% homework, 50% final.

Office hour: Set up by email. Only conceptual questions, please no specific questions on homework.

Website: Canvas Cornell

Travel dates: 9/18, 9/23, 9/25 and 10/9. My students/postdocs will substitute.