

1 Physics 580 Books on Reserve at Grainger Library

1.1 Textbooks

- Gottfried and Yan, *Quantum mechanics : fundamentals*, 530.12 G71q2003 Advanced text, has best overlap with Physics 580
- Shankar, Ramamurti, *Principles of quantum mechanics*, 530.12 Sh18p1994 Clearly written, some topics missing for Physics 580
- Sakurai, J. J. , *Modern quantum mechanics*, 530.12 Sa2m2011 Sakurai is an excellent writer, and what is included is very good. Several important topics for Physics 580 are not covered.
- Baym, Gordon, *Lectures on quantum mechanics*, 530.12 B344l Local author, many nice physical arguments.
- Merzbacher, Eugen, *Quantum mechanics*, 530.12 M55Q1998 Very clear older text
- L. D. Landau and E. M. Lifshitz, *Quantum mechanics : non-relativistic theory* 530.12 L231QES1977, Classic book. Contains many concise beautiful physical arguments. Contains much material not in other books.
- Schiff, Leonard I, *Quantum mechanics*, 539.1 SCH3Q1955 Another very clear older text.
- Claude Cohen-Tannoudji, Bernard Diu, Franck Lalo, *Quantum mechanics*, 530.12 C66MEH Two volumes at the advanced undergraduate level. Many applications are discussed. Many good practice problems.

1.2 Classics

- Von Neumann, John, *Mathematical foundations of quantum mechanics*, 530.12 V89MEB Readable account of Hilbert Space. Valuable for discussion of density matrix and measurement theory.
- Pauli, Wolfgang, *General principles of quantum mechanics*, 530.12 P283P:E Very clear, contains most topics discussed in graduate QM
- Schrödinger, Erwin, *Collected papers on wave mechanics*, 539.1 SCH7A:E1982 Translations of Schrodinger's basic papers on wave mechanics. Good for seeing the use of the action and Hamilton's principle. Works out many results for the first time, which are now standard material.
- Dirac, P. A. M., *The principles of quantum mechanics*, 539.1 D62p1967, Probably the greatest single book on QM. Dirac is clear, does not waste words, gives innumerable insights.

1.3 Special Topics

- Omnés, Roland, *The interpretation of quantum mechanics*, 530.12 OM5I, Very good book on the problems of understanding quantum mechanics on the macro level and quantum measurement theory. Early chapter contains nice summary of all of QM.
- Schlosshauer-Selbach, Maximilian, *Decoherence and the quantum-to-classical transition* Online Resource Interesting book on the question of whether “decoherence” in QM can explain the classical world we live in.
- Bell, J. S., *Speakable and unspeakable in quantum mechanics*, 530.12 B413S Collection of papers by the author of the famous “Bell Theorems.”
- Michael A. Nielsen and Isaac L. Chuang, *Quantum computation and quantum information*, 511.8 N554q, The best book on QI. Early chapters are easy reading and overlap Physics 580.