

This list contains various readings on entanglement, the density matrix, foundations of Quantum Mechanics, decoherence, teleportation, quantum computing, quantum information, cryptography, etc... Together with Sakurai's 'Modern quantum mechanics,' Gasiorowicz and Abers, it gives you a complete list of sources I used to prepare the lectures.

- Lecture notes on Quantum Computation by John Preskill

<http://www.theory.caltech.edu/~preskill/ph229/#lecture>

Lots of topics: entanglement, density matrix, decoherence, logic gates, error correction and quantum algorithms.

Books: (Hopefully in the library on reserve.)

- Ronald Omnes 'Understanding quantum mechanics.' A look at the modern interpretation of quantum mechanics, the measurement problem and the role of decoherence.
- Collin P. Williams and Scott H. Clearwater 'Explorations in Quantum Computing.' Quantum computing made simple. Meant for the nonspecialist, but useful for some things.
- George Greenstein and Arthur G. Zajonc 'The quantum challenge' A book about the meaning of quantum mechanics, with lots of experiments. Very informative.

Experiments discussed in class:

- 'Experimental Tests of Realistic Local Theories via Bell's Theorem,' Alain Aspect, Philippe Grangier, and Grard Roger, Phys. Rev. Lett. **47** 460 - 463 (1981).
- 'Experimental Realization of Einstein-Podolsky-Rosen-Bohm Gedankenexperiment: A New Violation of Bell's Inequalities,' Alain Aspect, Philippe Grangier, and Grard Roger, Phys. Rev. Lett. **49** 91 - 94 (1982).
- 'Experimental Test of Bell's Inequalities Using Time-Varying Analyzers,' Alain Aspect, Jean Dalibard, and Grard Roger, Phys. Rev. Lett. **49** 1804 - 1807 (1982).
- 'Experimental quantum teleportation,' Dik Bouwmeester, Jian-Wei Pan, Klaus Mattle, Manfred Eibl, Harald Weinfurter and Anton Zeilinger, Nature **390** 575 - 579 (1997).
- 'Decoherence of matter waves by thermal emission of radiation,' Lucia Hackermller, Klaus Hornberger, Bjrjn Brezger, Anton Zeilinger and Markus Arndt, Nature **427** 711-714 (2004).