Quantum Mechanics 3/2
3 hours per week
Summer semester, 2008/2009

Topics:
1. Mathematics for Quantum Mechanics.
2. Postulates of Quantum Mechanics for pure states.
3. Surprises of Quantum Mechanics.
4. From classical trajectories to quantum paths.
5. Entangled states and further surprises.
6. Classical and quantum gates and circuits.
7. Quantum computation and algorithms.
8. Mixed states and postulates.
9. Classical and quantum information.
10. Generalized measurements and quantum channels.

Bibliography:
1. J. Schwinger, Quantum Mechanics, Springer, 2003.
2. M. Le Bellac, Quantum Physics, Cambridge, 2006.
3. R. Feynman, Wykłady o obliczeniach, Prószyński i S-ka, 2007.
4. R. B. Ash, Information Theory, Dover, 1990.
5. J. A. Buchmann, Wprowadzenie do kryptografii, PWN, 2006.
6. S. Y. Yan, Teoria liczb w informatyce, PWN, 2006.
7. W. J. Gilbert and W. K. Nicholson, Algebra współczesna z zastosowaniami, WNT, 2008.
8. M. A. Nielsen and I. L. Chung, Quantum Computation and Quantum Information, Cambridge, 2000.
9. G. Benenti, G. Casati and G. Strini, Principles of Quantum Computation and Information, World Scientific, 2007.
10. S. Haroche and J.-M. Raimond, Exploring the Quantum, Oxford, 2006.
11. H. Kleinert, Path Integrals, World Scientific, 2006.
12. W. Dittrich and M. Reuter, Classical and Quantum Dynamics, Springer, 2001.