

Chemistry 125c - Spring 2007/08
Syllabus12

1. Multiparticle current density

- 1.1 General expression and conservation properties
- 1.2 Particle flux
- 1.3 Some simple cases

2. Scattering of a particle by a potential

- 2.1 Scattering of a time-dependent wave packet
- 2.2 The time-independent approach
- 2.3 Green's functions
- 2.4 The Born approximation
- 2.5 Partial waves, phase shifts and scattering matrix
- 2.6 Resonances
- 2.7 Scattering by a Coulomb field

3. General properties of angular momentum

- 3.1 Coupling of two angular momenta
- 3.2 Angular momentum operators as generators of rotations
- 3.3 Wigner rotation functions
- 3.4 Rotation of a rigid body

4. Symmetry properties in quantum mechanics and conservation laws

- 4.1 Translation
- 4.2 Rotation, angular momenta and conservation laws
- 4.3 Reflection and inversion
- 4.4 Time reversal

Chemistry 125c - Spring 2005/06

Textbook

Quantum Mechanics, 2nd edition
E. Merzbacher
John Wiley & Sons, Inc., New York, 1970

Reference books

Introduction to the Quantum Theory of Scattering
L.S. Rodberg and R.M. Thaler
Academic Press, New York, 1967

Quantum Mechanics
Albert Messiah
John Wiley & Sons, New York, 1966

Quantum Mechanics, 2nd edition
A.S. Davydov
Pergamon Press, Oxford, 1976

Angular Momentum
R.N. Zare
John Wiley & Sons, New York, 1988