

HW #1, Due Sep 16(Wed), 9:00 am

1. Quantum Physics in College

- (1) What were the subjects in quantum mechanics that left you uneasy or confused?
- (2) Did you study Dirac's bra/ket formulation?

2. Classical Mechanics in College. Have you studied the following subjects? (Yes/No)

- (1) Action principle and Euler-Lagrange equation
- (2) Hamiltonian and Hamilton equations
- (3) Hamilton-Jacobi equation
- (4) Canonical or contact transformation
- (5) Noether's theorem
- (6) Poisson brackets
- (7) Liouville's theorem
- (8) Adiabatic invariants
- (9) Maxwell's equation
- (10) Basic Electromagnetism
- (11) Vector potential
- (12) Lagrangian Field Theory
- (13) Special Relativity
- (14) General Relativity

3. Mathematical Methods in College. Have you studied the following subjects?

- (1) Steepest decent method (Yes/No)
- (2) Differential forms (Yes/No)
- (3) What kind of mathematics that appeared in Quantum Physics did you find unfamiliar?

4. Computer programming. Are you familiar with the following computer programming?

- (1) Mathematica (Yes/No)
- (2) C/C++ (Yes/No)
- (3) Fortran (Yes/No)
- (4) Solve a differential equation numerically?