The first class on August 25 will only be for information. Prof. Martin is out of town and the teaching assistant Jiansheng Wu will meet the class to give information on the web site, the first homework and other information. The material for lecture 1 will be covered on Tuesday, August 29, when we will also cover much of the background material in lecture 2.

Note on lectures: For each lecture there will be an outline linked on the course calendar page. In many cases additional material will be also be linked from the course calendar page.

561 F 2005 Lecture 1

Overview of Course

1. Introduction: Condensed Matter - strongly-interacting many-body system

2. Elementary Excitations

3. Correlation Functions and Green's Functions

4. Interacting Electrons and Phonons: quasiparticles and response functions

5. Strongly interacting systems: Metal-Insulator transitions, etc. - Dynamical Mean Field Theory

6. Broken Symmetry, order parameters, phase transitions

7. Classification of states by topology of the quantum wavefunction: Bohm-Aharonov effect, Berry's phase, . . .

8. Superconductivity, quantum Hall effect, . . .

Homework 1
Linked on the course calendar page.
Due Thursday, September 8 by end of the day.

Homework 1 is a set of practice problems which are a review of second quantization, some quantitative estimates of the energy scales, and formulas for non-interacting particles.