Statistical Mechanics I

Lectures: WF, 2:00-3:20, C2-278.
Instructor: Anton Burkov.
Office hours: open door.
TA: Natacha Altamirano, naltamir@uwaterloo.ca
Homework: every 2 weeks (roughly).
Grade: homework 50%, final 50%.

Course outline

- Introduction. Fundamentals of Statistical Mechanics.
- Gibbs distribution.
- Derivation of thermodynamics from the Gibbs distribution.
- Theory of ideal gases. Bose-Einstein and Fermi Dirac distributions. Planck distribution and black body radiation. Phonons.
- Statistical mechanics of interacting systems. Second quantization. Superfluidity of liquid helium. BCS theory of superconductivity. Ginzburg-Landau theory of superconductivity.
- Second order phase transitions.

Textbook:

1. R.K. Pathria & P.D. Beale, *Statistical Mechanics*.
2. L.D. Landau & E.M. Lifshitz, *Statistical Physics, Vol. 1, 2*.