PHYS429 : Statistical Mechanics

- **Instructor** : Hande Toffoli
  - Office : Rm 439, Physics Building
  - Phone : 210 3264
  - Email : ustunel@metu.edu.tr

- **Grader** : Karaca Okan Orhan

- **Course Web page** : www.physics.metu.edu.tr/~hande/teaching/429.html

- **Main Textbook** : Introductory Statistical Physics by Roger Bowley and Mariana Sanchez, 2nd edition (available in the bookstore)

- **Additional Textbooks** :
  - Introduction to Modern Statistical Mechanics by David Chandler
  - Statistical Mechanics by R. K. Pathria, 2nd edition

- **Logistics** :
  - Lectures :
    - Mon 15:40-17:30 (Rm 421)
    - Fri 10:40-12:30 (Rm 436)
  - Homework will be assigned every other week on Mondays. You will have two weeks to complete it, and will turn it in on Monday, at which time there will be a recitation to solve the homework problems and additional problems.
  - Some homework assignments will involve small programming problems. If you do not remember your Octave/Matlab/C, you will need to review it.
  - Although the main textbook is that of Bowley, we will read extensively from the other two and scientific papers.

- **Grading** :
  - Homework (20%), two in-class midterms (20% each), in-class final (30%), term project (10%)

- **Subjects to be covered (TENTATIVE, subject to change)** :
  - Week 1-3 : Thermodynamics (Ch 1-2)
  - Week 4-5 : Basic ideas of statistical mechanics (Ch 3-4)
  - Week 6-7 : The canonical ensemble (Ch 5)
  - Week 8-9 : Identical particles (Ch 6)
  - Week 9-10 : Maxwell and Planck's distribution (Ch 7-8)
  - Week 11 : Grand canonical ensemble (Ch 9)
  - Week 12 : Fermi and Bose particles (Ch 10)
  - Week 13-14 : Applications as time permits (phase transitions, renormalization group theory, Monte Carlo, classical fluids)