Title: SIMULAZIONI E METODI MONTE CARLO

Aim of the course: The course aims at offering an overview on the Monte Carlo simulation techniques and on their use in Statistical Mechanics, with a special focus on interacting particle systems and Ising models.

Duration: 6 hours divided into 3 lectures.

Arguments: Markov Chains, The Metropolis Algorithm, Kinetic Monte Carlo, Applications to interacting particle systems and spin models.

Program: A tentative program is the following:

- Lecture 1: Markov chains
- Lecture 2: Metropolis MC and Kinetic MC
- Lecture 3: Lattice gases and Ising models

Bibliography: Some classic textbooks and references on these subjects are listed below:

D. Landau and K. Binder, A Guide to Monte Carlo Simulation in Statistical Physics, Cambridge University Press, 2000.

G. T. Barkema and Mark Newman, Monte Carlo Methods in Statistical Physics, Oxford University Press, 1999.

P. Kratzer, Monte Carlo and Kinetic Monte Carlo Methods - A Tutorial, Multiscale Sim. Meth. Molecular Sc., **42**, 51 (2009).

Extended abstract: To be done.