



Lecture Series

Monte Carlo Sampler

by

Professor James E. Gubernatis

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Date: December 6, 2007 (Thursday)

Time: 1:30 p.m. – 3:00 p.m.

Venue: Rm. G25A, Science Centre North Block,
CUHK, Shatin, N.T.

Lecture One:

1. Concept of sampling
2. Examples of basic sampling methods
 - discrete distributions
 - continuous distributions
 - acceptance-rejection methods
 - von Neuman's method
3. Concept of a Markov chain

Lecture Two: *(date and time to be announced)*

4. Examples of their use
 - Metropolis algorithm
 - estimation an eigenvalue
 - solving a linear system of equations
5. Examples of variance reduction methods used in Markov chains
 - importance sampling
 - roulette and splitting
 - expected values

Brief biography of the speaker:

Dr. Gubernatis did his Ph.D. work at Case Western Reserve University and his post-doctoral work at Cornell University. Then he joined the staff of the Los Alamos National Laboratory where he has been since then. His research has focused on computational approaches to problems in condensed matter physics. Of emphasis has been on Monte Carlo approaches to quantum many-body problems. With these approaches he has investigated such phenomena as ferromagnetism, superconductivity, and ferroelectricity.

Dr. Gubernatis is a world-class physicist who accomplished a number of significant contributions to condensed matter physics and computational physics. Besides being the Fellow of American Physical Society, he also holds several prestigious positions of physical society. For example, Dr. Gubernatis is presently the US representative to the Commission on Computational Physics of IUPAP (2006-09) and he was Chair (2002-03) and member of executive committee of the Division of Computational Physics (DCOMP) of the American Physical Society (1999-2003).