Intensive Course

Advanced Monte Carlo methods - computational challenges

Objective: **The course presents the current state-of-the-art of numerical Monte Carlo methods, focusing on computational challenges. The main issues in the theory of methods will be discussed. The principles of designing efficient algorithms (algorithms with low dispersion), and optimal algorithms will be considered. Areas of application of Monte Carlo methods include integrals, integral equations, and boundary value problems for partial differential equations with large dimensions. A number of classical problems of linear algebra will be also considered.**

Computational challenges in solving large problems of ecology and nano-technology are discussed. Parallel properties of this type of algorithms are considered. Examples of solving very large computational tasks with Monte Carlo methods will be demonstrated.

The course is intended for PhD students and scientists who have serious computational tasks and seek for appropriate methods for their solution. The course will be useful for students in mathematics, computer science and physics who are familiar with the basics of numerical analysis and stochastic methods.

Structure: **15 hours lectures + 5 hours exercises and computer demonstrations**

Lecturer: **Professor Ivan Dimov (tel: 979-6641, 0886 587 406)**

Venue: **IICT – Bulgarian Academy of Sciences, Bl. 25 A, Room 218**

Starting Dates: **February 21, 2012 at 9:00 am**