Special Astronomy Colloquium
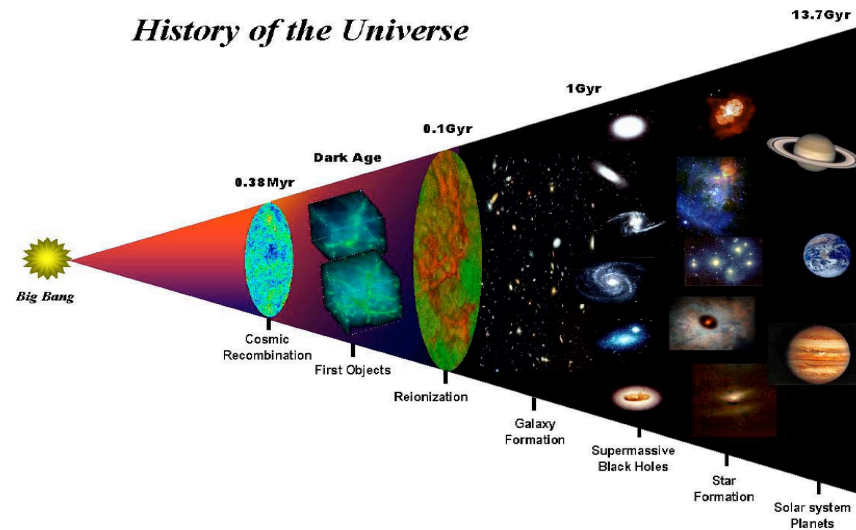
Computational Astrophysics with a Hybrid Simulator "FIRST"

Dr. Masayuki Umemura
Center for Computational Sciences, University of Tsukuba, Japan

Monday, December 8th 2008   4:00 p.m.
Avaya Auditorium ACES 2.302

History of the Universe

Abstract:

We have urged "FIRST project", which is a collaboration between astrophysicists and computer scientists, aiming at elucidating the origin of cosmic structure through large-scale simulations with a high-performance hybrid computer system. Under this project, we have developed a new type of hybrid computer, called FIRST simulator, where a newly-developed board for gravity calculations "Blade-GRAPE" is embedded in each node. The peak performance of FIRST simulator is 36.1 TFLOPS, where the host PC cluster is 3.1 TFLOPS and the Blade-GRAPEs are 33 TFLOPS. In this talk, we present the details of the FIRST simulator and the advances in computational astrophysics with this simulator, including astrophysical radiation hydrodynamics and collisionless Boltzmann calculations.