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Frontiers of Scientific Computing Lecture Series

Modeling Rare Events

Weinan E, Princeton University

Professor

Johnston Hall 338
March 05, 2013 - 03:30 pm

Abstract:

Many important dynamic processes in physics, biology, chemistry and material science can be viewed as being rare events. These events are difficult to model due to the disparity of the time scales involved. From an abstract viewpoint, this can be formulated as the problem of navigating a system over its energy landscape. We will discuss the theoretical framework for describing such events, as well as the numerical algorithms that have been developed. We will discuss applications to problems that arise in material science, chemistry and fluid mechanics.

Speaker's Bio:

Weinan E received his Ph.D. from UCLA in 1989. After being a visiting member at the Courant Institute of NYU and the Institute for Advanced Study at Princeton, he joined the faculty at NYU in 1994. He is now a professor of mathematics at Princeton University, a position he has held since 1999, as well as a professor of mathematics at the Peking University.

Weinan E is the recipient of the PECASE award, the Feng Kang Prize in scientific computing, the SIAM R. E. Kleinman prize and the Collatz prize awarded by the International Council of Industrial and Applied Mathematics. He is a member of the Chinese Academy of Sciences, a SIAM fellow an AMS fellow and a fellow of the Institute of Physics. Weinan E's research interest is in multiscale and stochastic modeling. His work covers issues that include mathematical foundation of stochastic and multiscale modeling, design and analysis of of algorithms and applications to problems in various disciplines of science and engineering, with particular emphasis on electronic structure analysis, rare events and fluid dynamics.