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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. He is also a Changjiang professor at the Peking University. 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 the modeling of rare events, material sciences and fluid dynamics. Weinan E is the recipient of the Presidential Early Career Awards for Scientists and Engineers (PECASE), the Feng Kang Prize, the SIAM R. E. Kleinman Prize, and the ICIAM Collatz Prize. He is a member of the Chinese Academy of Sciences, a fellow of the American Mathematical Society, a SIAM fellow and a fellow of the Institute of Physics.

Mathematical theory of solids: From quantum mechanics to continuum models

Abstract
The problem of trying to understand solids from microscopic and macroscopic viewpoints goes back to Cauchy and was taken up again by Born. In this talk, I will present the progress that has been made on this Cauchy-Born program. In particular, I will discuss how macroscopic continuum models of solids can be derived from models of quantum mechanics and molecular dynamics. I will also discuss stability of solids at the macroscopic, atomic and electronic scales.