香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF MATHEMATICS
SCHOOL OF SCIENCE, HKUST

HKSIAM
香港工業與應用數學學會

## Distinguished Lecture for HKSIAM and Hong Kong Universities

Sponsored by HKUST and HKSIAM

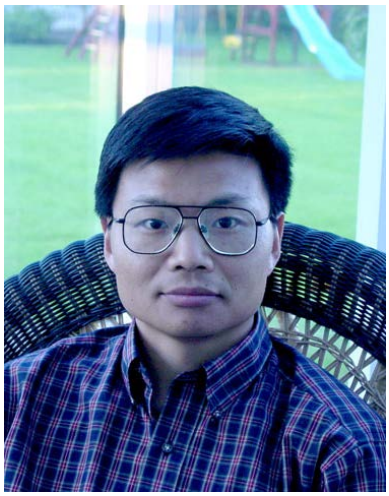
# *Thirty years of Applied Mathematics*


## Abstract

The 50's to the 80's saw tremendous growth of applied math, driven mainly by PDEs and numerical algorithms. The integration of the two produced the "Courant School", which has had a far-reaching impact on applied math and beyond, particularly in the area of fluid mechanics.

Since the 90's, the Courant school has faced some serious challenges. On one hand, a lot of the basic problems in numerical analysis and PDEs were already solved, the ones left proved to be truly difficult. On the other hand, efforts to move beyond fluid mechanics have not reproduced the kind of success that applied math had in fluid mechanics. In fact, during this period of time, applied math benefited more from the growth of signal processing, such as wavelets, image processing and compressed sensing.

Machine learning has come to the rescue for the Courant school, and it also provides the platform for the natural integration between the first principle-driven PDE school and the data-driven harmonic analysis/statistics school. The integration of these two schools of thoughts will give rise to unprecedented power for solving the problems we have faced in applied math and computational science. At the same time, it also provides the final missing component for applied math to become a mature scientific discipline with a unified scope and curriculum that will boost our ability to attract and educate young talents.


**Prof. Weinan E**

**Princeton University**


*Date:*
**11 Nov 2020, Wednesday**

*Time:*
**2pm – 3pm**

*Venue:*
*Online via Zoom*
**Meeting ID: 650 622 3751**
(Passcode: 2020)

**ALL ARE WELCOME**

## Biography

Professor Weinan E obtained his BS degree from the University of Science and Technology of China in 1982 and his PhD from the University of California at Los Angeles in 1989. He is currently a professor in the Department of Mathematics and Program in Applied and Computational Mathematics at Princeton University. Professor E has made tremendous contributions to homogenization theory, theoretical models of turbulence, stochastic partial differential equations, electronic structure analysis, multiscale methods, computational fluid dynamics, and machine learning theory and applications. He has won numerous awards, including the Presidential Early Career Award in Science and Engineering in 1996, Feng Kang Prize in Scientific Computing in 1999, ICIAM Collatz Prize in 2003, Ralph E. Kleinman Prize in 2009, Theodore von Kármán Prize in 2014 and Peter Henrici Prize in 2019. He was elected as a fellow of the Institute of Physics in 2005, a fellow of SIAM in 2009, a fellow of AMS in 2012 and a member of the Chinese Academy of Sciences in 2011. He was invited to speak at the International Congress of Mathematicians in 2002.