THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
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The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Recent developments in numerical methods for stochastic Stokes (and Navier-Stokes) equations

By

Prof. Feng Xiaobing
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Abstract

Besides the mathematical interests, stochastic Stokes and Navier-Stokes equations have been proposed to study turbulence flow under random forcing. Even in the simplest setting, their PDE solutions have very low regularity, which then poses a significant challenge for developing convergent and efficient numerical methods for the stochastic Stokes and Navier-Stokes equations. In particular, numerical experiments shown that the well-known and popular numerical methods (such as mixed finite element methods, projection methods, stabilized methods) for their deterministic counterparts do not work well in the stochastic setting. In this talk I shall first present some recent progress in understanding the underlying mechanisms that contribute to the underperformance of those popular numerical methods for the stochastic Stokes (and Navier-Stokes) equations. I shall then discuss some proposed remedies for improving and saving those numerical methods so that they can perform optimally in the stochastic setting.

Bibliography

Professor Feng Xiaobing is a Tenured Full Professor at Department of Mathematics, University of Tennessee, USA, and Chang Jiang Chair Professor at Northwestern Polytechnical University. Professor Feng received Bachelor and Master degrees from Xi'an Jiaotong University, and PhD degree from Purdue University. His research interests include the numerical solution and analysis of nonlinear partial differential equations, stochastic partial differential equations, phase field equations, and so on. He has published over 100 papers in world-class professional academic journals, including SIAM Review, SIAM J. Numerical Analysis, Mathematics of Computation, Numerische Mathematik, SIAM J. Mathematical Analysis, Transaction of American Mathematical Society.

Date : 16 December, 2020 (Wednesday)
Time : 10:30-11:30 (Hong Kong Standard Time GMT +8)
Venue : Online Talk via Zoom(Meeting ID: 929 5433 1288)
Speaker: Prof. Feng Xiaobing, The University of Tennessee
Host: Dr. Li Buyang, The Hong Kong Polytechnic University
Click to join : https://polyu.zoom.us/j/92954331288

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