Halmos College of Arts and Sciences
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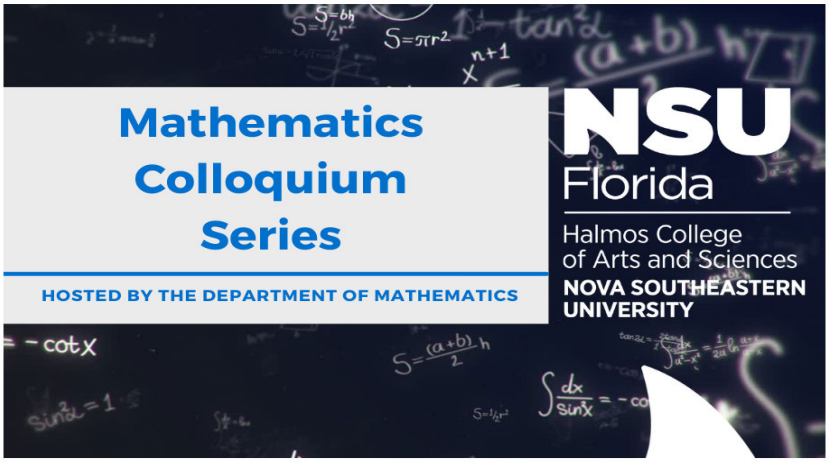

Time: Thursday, March 10, 2022, 12:30-1:20pm

Zoom Link: [redacted]

Speaker: Xiaofan Li, Ph.D., Professor

Illinois Institute of Technology, Department of Applied Mathematics, Chicago, Illinois

Title: Numerical schemes for integro-differential equations related to alpha-stable processes

Abstract: The mean first exit time, escape probability and transitional probability densities are utilized to quantify dynamical behaviors of stochastic differential equations with non-Gaussian, α-stable type Lévy motions. Taking advantage of the Toeplitz matrix structure of the time-space discretization, a fast and accurate numerical algorithm is proposed to simulate the nonlocal Fokker-Planck equations on either a bounded or infinite domain. Under a specified condition, the scheme is shown to satisfy a discrete maximum principle and to be convergent. The numerical results for two prototypical stochastic systems, the Ornstein-Uhlenbeck system and the double-well system are shown.

The entire NSU community, including students at all levels of mathematics, is invited and encouraged to attend.

About the speaker: Dr. Li received his BS in Applied Mathematics from Zhejiang University, and an MA and PhD in Applied Mathematics from UCLA. He was a postdoc at UCSD and The Ohio State University. Dr. Li joined the Department of Applied Mathematics at Illinois Institute of Technology in 1999, serving as Assistant Professor, Associate Professor and Professor. He has served as the Director of Graduate Studies since 2005, was Associate Dean of the Graduate College from 2011-2013, was an Associate Dean in College of Science from 2013-2019 and has served as an Associate Dean in College of Computing since 2019. His research interests include moving boundary value problems in fluid mechanics and materials science, numerical methods for nonlocal equations, nonlinear standing waves in acoustics and transport equations in ion channels.