



## Joint LadHyX - LMS Seminar

5 May 2022 at 11:00 am - Room Jean Mandel

### Nonlocal modeling, analysis and computation: some recent development

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#### ABSTRACT

Nonlocality has become increasingly noticeable in nature. The modeling and simulation of its presence and impact motivate new development of mathematical theory. In this lecture, we focus on nonlocal models with a finite horizon of interactions, and illustrate their roles in the understanding of various phenomena involving anomalies, singularities and other effects due to nonlocal interactions. We also present some recent analytical studies concerning nonlocal operators and nonlocal function spaces and discuss how they facilitate the development of robust numerical algorithms.

#### BIOGRAPHY

Dr. Du is the Fu Foundation Professor of Applied Mathematics at the Department of Applied Physics and Applied Mathematics (APAM) at Columbia University. Dr. Du earned Ph.D. in Mathematics (1988) from Carnegie Mellon University. He then worked as a Dickson Instructor at University of Chicago, after which he has held tenured and visiting faculty positions at a few institutions in US and Hong Kong. Most recently he was the Verne M. Willaman Professor of Mathematics and Professor of Materials Science and Engineering at Penn State University, before joining Columbia in 2014. Dr. Du's research interests are in numerical analysis, mathematical modeling and scientific computation with selected applications in physical, biological, and materials sciences, as well as data and information sciences and machine learning.