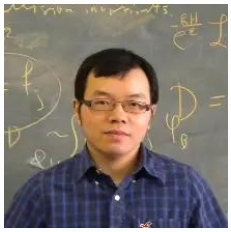
北京理工大學

数学与统计学院学术报告

Finite Difference Methods for fractional Laplacian of radial functions

报告人： Yanghong Huang (The University of Manchester)

时间： 2025.12.29 (周一) 下午 2:40--3:20



地点：良乡校区文萃楼D703

邀请人： 李庆娜 教授

摘要： Numerical evaluation of nonlocal operators like the fractional Laplacian is more computationally intensive because of the dependence on the underlying function over the whole space. On the other hand, many solutions to the fractional counterparts of classical semi-linear PDEs, especially ground states obtained via variational methods, are radial. In this talk, fractional Laplacian of radial functions in general dimensions will be considered with a kernel represented by a Gauss hypergeometric function of the radial variables. The singular part of the kernel is isolated and then treated with effective methods well studied in the one-dimensional context, while the regular part can be evaluated with by classical quadrature. The method can be extended to general non-radial functions that can be expanded using spherical harmonics, making it effective in the numerical study of fractional equations and complementing existing theoretical investigations.

报告人简介： Dr. Yanghong Huang obtained his PhD from UCLA in 2010, and joined the University of Manchester in 2015 after being a postdoctoral researcher in Simon Fraser University and Imperial College London. He works on both applied analysis and numerical approximations of nonlocal differential equations, especially those related to fractional Laplacian. He published about 30 journal papers, including several influential ones cited more than 100 times on MathSciNet.

主办单位：北京理工大学数学与统计学院
School of Mathmatics and Statistics, Beijing Institute of Technology