

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

Extended Spectral Methods for Some Differential Equations

**By
Prof. XU Chuanju
Xiamen University**

Abstract

In this talk we will discuss high order methods for some classes of differential equations. The equations that we are interested in include: traditional elliptic equations, integro-differential equations, fractional differential equations, and so on. One of the main features of these problems is their non-locality or singularities, which makes the design of numerical methods difficult. We will present some efficient numerical methods specially adapted to these problems, including fast high order time stepping schemes with low storage for the time fractional differential equation, an extended spectral method for fractional integro-differential equations. In particular, some new methods making use of Muntz polynomials will be analyzed for problems with solutions of low regularity.

Bibliography

Prof. Xu Chuanju is a distinguished professor at School of Mathematical Sciences, Xiamen University. Prof. Xu obtained his PhD from Paris Sixth University in 1993. His research fields include computational fluid spectral element method, efficient algorithm for gradient flow models, high-precision algorithms for singular problems, high-order numerical methods for fractional partial differential and integral equations, and so on. Prof. Xu has collaborative research projects with many universities in China and abroad, including Nice University, Bordeaux University, ENSAM, Université de Technologie de Compiègne, Poitiers University, Technical University of Denmark, and so on. Prof. Xu serves in the editorial board of many international academic journals, including SIAM Journal on Scientific Computing, Discrete and Continuous Dynamic Systems Series S, East Asia Journal on Applied Mathematics, AIMS Mathematics, etc.

Date : 23 September, 2020 (Wednesday)

Time : 14:00-15:00 (Hong Kong Standard Time GMT +8)

Venue : Online Talk via Zoom(Meeting ID: 97941075648)

Host: Dr. Li Buyang, The Hong Kong Polytechnic University

Speaker: Prof. XU Chuanju, Xiamen University

Click to join : <https://polyu.zoom.us/j/97941075648>

* The Talk will be given in English.



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***** ALL ARE WELCOME *****

For enrolment, please send your name and email to chingching.lu@polyu.edu.hk on or before 20 Sept 2020