THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

MATHEMATICS COLLOQUIUM

Modelling the human cardiovascular system with the incompressible Navier-Stokes equations

By

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Abstract

The recent development of supercomputing technologies has enabled the development of some fast methods for solving the incompressible Navier-Stokes equations to model blood flows in the human cardiovascular system with clinical accuracy. Such computational methods offer a new generation of techniques to predict the health of the cardiovascular system and help the diagnosis of certain diseases such as high blood pressure, and heart attack. These high-fidelity full-body numerical computations also provide insights into the optimal or sub-optimal states of the health of the human cardiovascular system and suggest ways to improve and maintain a healthy lifestyle.

Bio: Xiao-Chuan Cai received his BSc degree in 1984 from Peking University, MSc in 1988 and PhD in 1989 from Courant Institute, New York University. He was a postdoc during 1989-1990 at Yale University. After about 30 years in the Department of Computer Science, University of Colorado Boulder, he recently jointed the Department of Mathematics, University of Macau, as a Chair Professor. His research interests are in the areas of large-scale scientific computing and computational biomechanics. He is a fellow of SIAM

Date : **27 February 2026 (Friday)**

Time : **3:00pm - 4:00pm**

Venue : **Lecture Theatre F (Lift 25/26)**

All Are Welcome!