

#### The Hong Kong University of Science and Technology

#### **Department of Mathematics**

# **Mathematics Colloquium**

# An accurate and robust approach for a class of dissipative/conservative nonlinear systems

by

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#### Abstract

Many physical processes are governed/modeled by dissipative/conservative nonlinear systems with complicated nonlinear free energy or Hamiltonian. We present in this talk the scalar auxiliary variable (SAV) approach to effectively deal with nonlinear terms in these systems. The technique is not restricted to specific forms of the free energy or Hamiltonian, it leads to linear and unconditionally energy stable schemes which only require solving decoupled linear equations with constant coefficients. Hence, these schemes are extremely efficient and can be coupled with high-order BDF schemes.

We shall present a convergence and error analysis under mild assumptions on the nonlinear free energy, and discuss applications of the SAV approach to various complex dissipative/conservative systems.

**Date: Friday, 3 May 2019** 3:00p.m. - 4:00p.m. Time:

Venue:

Lecture Theater F, Academic Building, 1/F (near Lifts 25 - 26), HKUST

All are welcome!