

*Seminar*

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### Topic

Efficient Algorithm and Analysis for the Yang-Mills-Higgs Equations with Temporal Gauge

### Date | Time

19<sup>th</sup> April 2024 (Friday) | 4:00 pm – 5:00 pm (HK Time)

### Venue

Y301, Main Campus

### Abstract

In this talk we will introduce our recent advances in efficient algorithm and analysis for the Yang-Mills-Higgs equations with temporal gauge. First, we will briefly talk about the fundamental physical questions and the associated mathematical models in quantum field theory. Meanwhile, we will introduce the relationship between the Maxwell-Schrödinger system and Yang-Mills-Maxwell equations. Second, we will focus on discussing the finite element method for the Yang-Mills-Higgs equations with temporal gauge. An efficient linearized strategy for the Lie bracket  $[A, A]$  is presented, the novel implicit scheme in time for the Yang-Mills-Higgs equations based on the above linearized strategy is developed, which preserves the conservation of its discrete energy. The convergence of the linearized strategy and the error estimates of the fully discrete scheme are proved. Finally some numerical results and typical applications are reported. This talk is based on the joint work with Ruiyang Li.

**ALL ARE WELCOME**