THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

Tulczyjew's Approach for Particles in Gauge Fields

By

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Abstract

In classical mechanics, the dynamics of a particle with the configuration space X can be described by either the Lagrangian formalism (L: TX → ℝ) or the Hamiltonian formalism (H: T*X → ℝ), which are related by the Legendre transformation. In the 1970s, W. M. Tulczyjew unified these formalisms on a Lagrangian submanifold of TT*X (the total tangent space of T*X), rendering the Legendre transformation into the identity symplectic diffeomorphism. In recent developments, G. W. Meng extended Tulczyjew's Approach to the description of the dynamics of charged particles in gauge fields, where the classical phase space T*X is replaced by Sternberg phase spaces. Tulczyjew's approach is versatile in many different dynamical settings, and reveals the symplectic geometry behind the dynamical system.

Date : **7 May 2025, Wednesday**

Time : **4:00pm**

Venue : **Room 2128B (Lift 19)**

All are Welcome!