



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

ALGEBRA AND GEOMETRY SEMINAR

From abelian schemes to Hitchin systems:
cohomology, sheaves, and algebraic cycles

(Lecture Series: I, II and III)

By

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Abstract

This is a series of 3 talks, where we will focus on geometry and topology of abelian fibrations --- these are maps whose general fibers are complex tori but special fibers may be highly singular and complicated. The decomposition theorem of Beilinson, Bernstein, Deligne, and Gabber (BBDG) provides powerful tools for studying these maps; Corti-Hanamura further conjectured that the sheaf-theoretic BBDG decomposition is governed by algebraic cycles. In my talks, I will explain how to find these algebraic cycles for certain geometries. I will start with the case of an abelian scheme (i.e., an abelian fibration without singular fiber), where the desired cycles have been found by Beauville and Deninger-Murre more than 30 years ago. Then I will discuss the case with singular fibers. Our ultimate goal for this lecture series is to explain how to find the cycles for Hitchin's integrable system. If time permits, I will discuss how/why these cycles can help us to understand various cohomological and sheaf-theoretic questions/conjectures for the Hitchin system. Based on joint work (in progress) with Davesh Maulik and Qizheng Yin.

Date : 07, 08 and 09 May 2024

(Tuesday, Wednesday and Thursday)

Time : 4:30pm – 5:30pm

Venue : Room 2408 (Lifts 17/18)

All are Welcome!