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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

Equality of cluster and upper cluster algebras from moduli space of *G*-local systems

By

Mr. Kailong GAO

Abstract

The cluster algebras $\mathcal{A}$ are a class of commutative algebras equipped with a distinguished family of generators called cluster variables. The upper cluster algebras $\mathcal{U}$ is the intersection of Laurent polynomial rings associated with all clusters. By Laurent phenomenon, $\mathcal{A} \subset \mathcal{U}$ as a subalgebra, but in general they are not equal. For a finite-dimensional simply-connected connected simple Lie group G over $\mathbb{C}$ and a connected marked surface Σ, we can associate a cluster algebra $\mathcal{A}_{G,\Sigma}$.

In this seminar, we introduce a recent work by Ishibashi–Oya–Shen that the cluster algebra $\mathcal{A}_{G,\Sigma}$ coincides with its upper cluster algebra $\mathcal{U}_{G,\Sigma}$. The main tool is $A^{\times}_{G,\Sigma}$, the moduli space of decorated twisted G-local systems on Σ, introduced by Fock–Goncharov, and Wilson lines introduced by Ishibashi– Oya. The proof is based on the fact that the function ring $\mathcal{O}(A^{\times}_{G,\Sigma})$ is generated by matrix coefficients of Wilson lines.

Date : 6 May 2022 (Friday)
Time : 4:00pm
Zoom Meeting : https://hkust.zoom.us/j/93230862751 (Passcode: 159348)

All are Welcome!