THE UNIVERSITY



**OF HONG KONG** 

Institute of Mathematical Research Department of Mathematics#

## **Number Theory Seminar**

## Harmonic cocycles for $GL_3$ : Old and new forms and slopes of the U-operators

## **Professor Gebhard Böckle**

Heidelberg University

## Abstract

In this talk, I shall report on joint work with P. Gräf and T. Kaiser on computations of eigenvalues of the two U-operators for  $GL_3$  on harmonic cochains that (conjecturally) arise from Drinfeld cusp forms. Our computed data yields tables of slopes comparable to those of Gouvea-Mazur for cuspidal elliptic modular forms in the  $GL_2$  setting. Our tables show similarities but also clear differences to theirs. Our approach was in parts inspired by similar work of Bandini-Valentino for  $GL_2$  Drinfeld cusp forms. To better interpret our findings, we also develop a theory of old and new forms in the  $GL_3$  setting, which explains well some patterns in our tables. Unlike in the characteristic zero case, we can only verify numerically some of our structural predictions on new and old forms.

Date: June 18, 2025 (Wednesday) Time: 3:00 – 4:00pm Venue: Room 210, Run Run Shaw Bldg., HKU

All are welcome