



**THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY**

**Department of Mathematics**

**ALGEBRA AND GEOMETRY SEMINAR**

**Universal Virasoro constraints for  
quivers with relations**

by

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**Abstract**

The recent reformulation of sheaf-theoretic Virasoro constraints opens many doors for future research. In particular, one may consider its analog for quivers. After phrasing a universal approach to Virasoro constraints for moduli of quiver-representations, I will sketch their proof for any finite quiver with relations, with frozen vertices, but without cycles. I will use partial flag varieties which are a special case of moduli of framed representations as a guiding example throughout. Using derived equivalences to quivers with relations, I give self-contained proofs of Virasoro constraints for all Gieseker semistable sheaves on  $S = \mathbb{P}^2 \times \mathbb{P}^1$ , and  $\mathrm{Bl}_{\mathrm{pt}} \mathbb{P}^2$ . Combined with an existing universality argument for Virasoro constraints on Hilbert schemes of points of surface, this leads to a proof for any  $S$  which is independent of the previous results in GW theory.

**Date : 30 April 2024 (Tuesday)**

**Time : 4:30pm – 5:30pm**

**Venue : Room 3598 (Lifts 27/28)**

*All are Welcome!*