

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research  
Department of Mathematics*

## MINI COURSE

# Short course on Geometric Invariant Theory and Applications

**Prof. Yi Hu**

The University of Arizona

### Outline of the lectures

#### Lecture 1: Basics of GIT

- 1.1 Motivating examples
- 1.2 Categorical, geometric good quotients
- 1.3 Hilbert-Nagata finite generation theorem and affine quotients
- 1.4 Linearization and stability
- 1.5 Existence of GIT quotients

#### Lecture 2: Criteria for Stability

- 2.1 The orbital criterion
- 2.2 Mumford's numerical criterion
- 2.3 The Kempf-Ness analytic criterion
- 2.4 The moment map criterion
- 2.5 Relation with symplectic reduction

#### Lecture 3: Selected Further Topics

- 3.1 VGIT (Variation of Geometric Invariant Theory Quotients)
- 3.2 Stability of projective hypersurfaces
- 3.3 Relation with Hilbert/Chow quotients
- 3.4 Mori Dream Spaces and GIT

Lecture 1:	February 18, 2025 (Tuesday)	2:00 – 3:30 pm
Lecture 2:	February 19, 2025 (Wednesday)	2:00 – 3:30 pm
Lecture 3:	February 21, 2025 (Friday)	10:30 – 12:00 noon

**Room 210, Run Run Shaw Bldg., HKU**

*All are welcome*