

Week One: K-稳定性理论

Abstract: This course aims to overview the algebraic theory of K-stability for Fano varieties and discuss methods to describe K-moduli spaces for explicit Fano varieties. The topics include the valuative criterion of K-stability, construction of the K-moduli space and its properties, the wall crossing framework for K-moduli spaces of log Fano pairs, and their relations to GIT, moduli spaces of curves and K3 surfaces.

Content:

- (1) The classical GIT stability and its relation to K-stability
- (2) Test configuration, numerical invariants, Fujita-Li's valuative criterion
- (3) Boundedness of Fano varieties, openness of K-semistability, K-moduli stack
- (4) Good moduli space and properness of K-moduli space
- (5) Examples: K-moduli of log Fano pairs: surfaces and 3-folds

Week one (07/10 to 07/14)

	Monday	Tuesday	Wednesday	Thursday	Friday
9:30- 11:30	K-稳定性理论 许晨阳-江辰	K-稳定性理论 许晨阳	K-稳定性理论 许晨阳	K-稳定性理论 许晨阳	K-稳定性理论 许晨阳
	Lunch 午餐				
13:30- 15:30	K-稳定性理论 许晨阳	K-稳定性理论 王晓玮	K-稳定性理论 刘雨晨	K-稳定性理论 刘雨晨	K-稳定性理论 王晓玮
15:30 - 16:30	Problem and Discussion Session	Problem and Discussion Session	茶歇 Problem and Discussion Session	Problem and Discussion Session	Problem and Discussion Session

Week Two: 导出范畴和 P=W 猜想

Abstract: This short course consists of two parts:

1. We will introduce the derived category, Bridgeland moduli spaces for K3 category, for example the Kuznetsov components of cubic fourfolds, and stability conditions in families.
2. We will introduce the P=W conjecture concerning two moduli spaces on a curve: the character variety and the Hitchin moduli space. We will start with an introduction of related background; then we will discuss some recent progress.

Content:

- (1) Moduli of stable sheaves
- (2) Bridgeland stability condition
- (3) Stability condition in families
- (4) Character varieties
- (5) Hitchin systems, Simpson's correspondence
- (6) Perverse sheaves, Mixed Hodge theory

Week two (07/17 to 07/21)

	Monday	Tuesday	Wednesday	Thursday	Friday
9:30- 11:30	导出范畴和P=W猜想 张子宇	导出范畴和P=W猜想 张子立	导出范畴和P=W猜想 沈俊亮	导出范畴和P=W猜想 赵晓磊	导出范畴和P=W猜想 赵晓磊-周杨
	Lunch 午餐				
13:30- 15:30	导出范畴和P=W猜想 张子立	导出范畴和P=W猜想 张子宇	导出范畴和P=W猜想 赵晓磊	导出范畴和P=W猜想 沈俊亮	导出范畴和P=W猜想 沈俊亮
15:30 -16:30	Problem and Discussion Session	Problem and Discussion Session	茶歇 Problem and Discussion Session	Problem and Discussion Session	Problem and Discussion Session