

**HIGHER RANK FINITE GENERATION AND PROPERNESS
OF THE K -MODULI SPACE**

Speaker: Ziquan Zhuang
Massachusetts Institute of Technology

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Abstract: K -stability is an algebraic condition that characterizes the existence of K -ahler-Einstein metrics on Fano varieties. Motivated by results in differential geometry, it is conjectured that the K -moduli space, which parametrizes K -polystable Fano varieties, is proper. In this talk, I'll explain why this conjecture is closely related to some finite generation property of higher rank valuations, and discuss some recent progress in birational geometry that leads to a full solution of the conjecture. Based on joint work with Yuchen Liu and Chenyang Xu.