

Abstract: Finding canonical metrics, such as Kähler-Einstein metrics, on compact Kähler varieties has been an intense topic of research for decades. I'll present some works (joint with Harold Blum, Yuchen Liu and Chenyang Xu) in this direction when the first Chern classes of the varieties are positive (such varieties are called Fano varieties). I'll focus on two particular aspects: the Yau-Tian-Donaldson conjecture, which says that the existence of Kähler-Einstein metrics on Fano varieties is equivalent to an algebraic stability condition called K-polystability, and an algebro-geometric analog of the Kähler-Ricci flow.