

Abstract

The theory of complements was introduced by Shokurov in his work on the existence of threefold log flips and has since become one of the central tools in modern birational geometry. A major breakthrough was Birkar's proof of the boundedness of complements for Fano-type varieties, which led to the proof of the boundedness of Fano varieties, known as the BAB Conjecture. Complement theory has also played a crucial role in recent developments in K-stability, particularly in the influential work of Chenyang Xu and his collaborators. Based on a series of joint works with my collaborators, I will review recent progress on the boundedness of complements and present several applications in birational geometry.