香 港 大 學
THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Frontiers of Mathematics Lecture

Kähler-Einstein metric, K-stability and moduli spaces

Abstract

The question of whether a smooth complex variety with a positive first Chern class, called a Fano variety, has a Kähler-Einstein metric has been a major topic in complex geometry since the 1980s. In the last decade, algebraic geometry, or more specifically higher dimensional geometry has played a surprising role in advancing our understanding of this problem.

The interplay between complex geometry and algebraic geometry has also provided deep insights into higher dimensional geometry, peaked by the algebraic construction of a projective moduli space that parametrizes Fano varieties. More precisely, the moduli space parametrizes Fano varieties satisfying the stability condition which is used to characterize the existence of a Kähler-Einstein metric - known as K-stability. In the lecture, I will explain the main ideas behind the recent progress of the subject.

Professor Chenyang Xu
Department of Mathematics,
Princeton University

Date :
June 30, 2023 (Friday)

Time :
5:00 – 6:00 pm
(Tea Reception starts at 4:30 pm)

Venue :
Lecture Theatre A, G/F,
Chow Yei Ching Building,
The University of Hong Kong

Biography

Chenyang Xu received both his undergraduate and master degrees from Peking University in 2002 and 2004. He went on to obtain his PhD from Princeton University in 2008. After completing his PhD, Xu held positions at several institutions, including University of Utah, Peking University and MIT. Currently, he is a professor at Princeton University.

Xu's research focuses on algebraic geometry, particularly the study of minimal model programs and K-stability. He has made notable contributions to this field and has been recognized for his work with awards and honours such as the Future Science Prize, being a 45-minutes invited speaker of the International Congress of Mathematicians (ICM), a new Horizon Prize in Mathematics, the Cole Prize in algebra and being named a Simons Investigator. Additionally, he serves as an editor of several journals, including the Duke Mathematical Journal.

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