



Distinguished Lecture of Yum-Tong Siu

9:00-11:00 a.m., July 24, 2019

Gu Lecture Hall, SCMS

# Special role of the canonical line bundle and techniques of multiplier ideal sheaves

## Abstract

The canonical line bundle, whose transition functions are the Jacobian determinants of coordinate transformations, comes naturally with any complex manifold. It plays a very special role, different from a general holomorphic line bundle. Many fundamental problems in complex manifold theory and algebraic geometry concern the canonical line bundle or the pluri-canonical line bundle. An important tool to study such problems is multiplier ideal sheaves, originating from regularity problems for weakly pseudoconvex domains, which introduce vanishing orders and differential relations of multipliers to handle PDE estimates. The talk will start with the history, background, and motivations without any assumption of knowledge beyond elementary complex manifold theory and algebraic geometry. Will focus at the end on the analytic approach to the finite generation of the canonical ring and the abundance conjecture.

## About the speaker

Professor Yum-Tong Siu is the William Elwood Byerly professor of Mathematics at Harvard University. He is a prominent figure in several complex variables and complex geometry. He has solved various important conjectures by applying estimates of the complex Neumann problem and the theory of multiplier ideal sheaves to algebraic geometry. Professor Siu is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the Goettingen Academy of Sciences, and the Chinese Academy of Sciences. He has been an invited speaker at the International Congress of Mathematicians in Helsinki (1978), Warsaw (1983) and Beijing (2002). Currently, he is a member of the Scientific Advisory Board of the Clay Mathematics Institute, the Advisory Committee for the Shaw Prize in Mathematics Sciences, the Millennium Prize Problems under the sponsorship of the Clay Mathematics Institute.