



*The Institute of Mathematical Sciences*  
*Department of Mathematics*  
**The Chinese University of Hong Kong**



# *Hong Kong Geometry Colloquium*

**October 3<sup>rd</sup>, 2015 (Saturday)**  
**Room 502a, Academic Building No. 1, CUHK**

## SCHEDULE

**10:00am - 11:00am**

**Speaker: Professor Chen-Yu Chi (National Taiwan University)**

**Title: Birational geometry of projective varieties and pseudonorms on their pluricanonical spaces**

*Abstract: In 1971, H. L. Royden proved that two compact Riemann surfaces are isomorphic exactly when there exists a linear isometry between their spaces of holomorphic quadratic differentials. Inspired by Royden's result, S.-T. Yau proposed a program aiming at birational classification of complex algebraic manifolds by studying canonical norm-like functions on spaces of holomorphic higher differentials. In this talk, we will introduce Yau's program as well as some related results.*

**11:00am - 11:20am**      Tea Reception

**11:20am - 12:20pm**

**Speaker: Mr. Jifu Xiao (Kyoto University)**

**Title: Large extremal transition and quantum cohomology**

*Abstract: In this talk, I will speak of how the quantum cohomology changes under extremal transition. Let  $X_{sm}$  be a non-singular algebraic variety whose first chern class is non-positive. The variety  $X_{sm}$  admits a degeneration which is denoted by  $X_{sing}$ . The singular variety  $X_{sing}$  admits a crepant resolution  $X_{res}$ . We say the varieties  $X_{sm}$  and  $X_{res}$  are related by extremal transition. We are interested in the following problem: is there any relationship between the quantum cohomology of  $X_{sm}$  and that of  $X_{res}$ ? Our work investigates the case when  $X_{sm}$  and  $X_{res}$  are three-folds and are related by the so called conifold transition. We also calculated some higher dimensional examples e.g.  $Gr(2,4)$  and  $Gr(2,5)$ . To our surprise, we found some new phenomena which is specific to higher dimensional cases. This talk is based on the joint work with Hiroshi Iritani.*

**12:20pm - 2:20pm**      Lunch

*Jointly organized by The Institute of Mathematical Sciences and Department of Mathematics, CUHK*

*Organizers: Kwokwai Chan, Conan Leung*

*∞ This event is supported by "Programme on Geometric Analysis" ∞*

*∞ All are Welcome ∞*