

# Chin-Lung Wang

## Position

Professor in Mathematics, NTU

## Research Fields

Algebraic Geometry, Differential Geometry and Hodge Theory



## Research Interests

My recent research interests cover the following subjects:

- *Quantum invariance under flops and transitions*  
In birational classification of algebraic varieties, it is a basic question to study the relations of various geometric invariants among all the birational minimal models. In a similar fashion, in string theory it is a basic question to study the relations of quantum field theories among all underlying background manifolds with different topological types. I am particularly interested in understanding the interplay between mathematics and physics around these questions. The guiding examples are flops and extremal transitions connecting moduli of Calabi-Yau 3 folds.
- *Analytic methods in algebraic geometry*  
In recent years, the minimal model program had been successfully developed for varieties of log-general type, and the general case was reduced to the non-vanishing conjecture for a pseudo-effective adjoint divisor. I am interested in studying the analytic approach to these problems based on the extensions of pluricanonical forms, as well as on other Hodge theoretic methods.
- *Geometric methods in partial differential equations*  
Joint with C.-S. Lin, we study the Liouville equation with singular source on a flat torus with strength  $\rho = 4k\pi$ . For  $k$  odd the problem can be transformed into affine intersection theory in algebraic geometry. For  $k$  even the structure of solutions depends on the geometry of the torus via the Green function.

## Research Group

- *Chen-Yu Chi (Harvard University, USA)*
- *Wu-Yen Chuang (National Taiwan University, Taiwan)*
- *Yuan-Pin Lee (University of Utah, USA)*
- *Hui-Wen Lin (National Taiwan University, Taiwan)*