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Hong Kong Geometry Colloquium

Saturday, February 18, 2012
Room 502A, Academic Building No.1, CUHK

Geometric Invariants on Calabi-Yau Manifolds from String Theory

by

Dr. Si Li
Northwestern University

at

10:00am - 11:00am

Abstract: I'll discuss some mathematical aspects of quantum geometry on Calabi-Yau manifolds motivated from closed topological string theory. There are two stories of totally different flavors: A-model with symplectic geometry, and B-model with complex geometry. They are connected by mirror symmetry. The A-model describes the curve counting of arbitrary genus on Calabi-Yau manifolds, which has been rigorously established as Gromov-Witten theory. However, the mathematical knowledge of B-model has been long limited to the genus zero case, which describes the variation of Hodge structures. I'll explain an approach of higher genus B-model from perturbative quantization of gauge theory. As an example, we prove the mirror symmetry on elliptic curves at all genera.

Orbifold Quantum Cohomology under Flops

by

Dr. Yunfeng Jiang
Imperial College London

at

11:30am - 12:30pm

Abstract: The relationship between Gromov-Witten invariants and birational geometry is a very important subject in Gromov-Witten theory. This provides the natural property of the theory. In this talk we will present the method on how genus zero Gromov-Witten invariants change under orbifold flops, which are crucial types of birational transformations. Let $Y \to Y'$ be a simple orbifold flop satisfying the so-called Hard Lefschetz condition. We show that there is a classical correspondence $\mathcal{F}$ on the orbifold cohomology of Y and Y' preserving the orbifold degree. We further prove that $\mathcal{F}$ preserves the orbifold quantum cohomology.

~ All Are Welcome ~