The Institute of Mathematical Sciences
The Chinese University of Hong Kong

Workshop on Differential Geometry

(including the Hong Kong Geometry Colloquium)

27th September, 2014 (Saturday)
Room 501a, Academic Building No. 1, CUHK

SCHEDULE

10:00am – 11:00am	**Yuguang Zhang** (MSC, Tsinghua University) *Infinite time singularities of the Kähler-Ricci flow*
11:00am – 11:20am	Tea Reception
11:20am – 12:20pm	**Jeff Brown** (IBS Center for Geometry and Physics) *Gromov-Witten invariants of some blow-ups of toric fibrations*
12:45pm – 2:15pm	Lunch
2:30pm – 3:30pm	**Chi-Kwong Fok** (NCTS, National Tsinghua University) *The real K-theory of compact Lie groups*
3:30pm – 4:00pm	Tea Reception
4:00pm – 5:00pm	**Man-Chun Martin Li** (CUHK) *Gluing construction for free boundary minimal surfaces*
6:30pm – 8:30pm	Workshop Banquet

TITLES & ABSTRACTS

Infinite time singularities of the Kähler-Ricci flow
Yuguang Zhang

In this talk, we study the relationship between the singularity type of long time solutions of the Kahler-Ricci flow and the underlying complex structure of the Kähler manifold. We give a complete classification of the singularity type at infinity for the surface case. It is based on a joint work with Valentino Tosatti.

Gromov-Witten invariants of some blow-ups of toric fibrations
Jeff Brown

Consider a fiber bundle, whose fiber is a toric variety, arising from symplectic reduction of a direct sum of line bundles over the base. Then each torus-fixed point of the fiber defines a section of the fiber bundle, that is diffeomorphic to the base. Let A be a divisor of such a fixed point section, satisfying some topological hypotheses. We will prove a mirror theorem for the blow-up of E along A; a formula that records some genus 0 Gromov-Witten invariants of the blow-up.

The real K-theory of compact Lie groups
Chi-Kwong Fok

Let G be a compact connected Lie group, viewed as a G-space via the conjugation action. A theorem of Brylinski-Zhang's states that the equivariant K-theory of G is the ring of Kähler differentials of its complex representation ring, while a recent deep theorem by Freed-Hopkins-Teleman asserts a canonical isomorphism between the twisted equivariant version and the Verlinde algebra of G. In this talk, I will present (partial) generalizations of both results in the context of Atiyah's Real K-theory.

Gluing Construction for Free Boundary Minimal Surfaces
Man-Chun Martin Li

Free boundary minimal surfaces in the Euclidean unit ball have caught much attention due to the recent work by A. Fraser and R. Schoen on extremal eigenvalue problem on surfaces with boundary. These minimal surfaces satisfy nice global geometric properties analogous to minimal surfaces in the 3-sphere. Unfortunately, examples up to date are very rare. In this talk, I would describe a gluing construction that generates examples with very high genus. The configuration resembles a desingularization of the intersection between the equatorial disk and the critical catenoid. This is joint work with N. Kapouleas.