

# MSRI

## Introductory Workshop on Geometric flows and function theory in real and complex geometry

September 11 – September 15, 2006

### Schedule

#### Monday, September 11

- 9:30 – 10:30 Ben Weinkove: Geometric flows and moment maps, part I
- 10:00 – 10:30 Tea Break
- 11:00 – 12:00 Jiaping Wang: Stability of harmonic functions  
Abstract: We aim to explain a result of P. Li and L. Tam relating the harmonic functions to the number of ends of a complete manifold. We start with their constructive proof of the existence of Green's function, and use the result to show the stability of the space of harmonic functions under the perturbation within a compact domain. We then reach the conclusion by carrying out a straightforward construction of the so-called barrier function on each end.
- 12:00 – 2:00 Lunch
- 2:00 – 3:00 Andre Neves: Lagrangian mean curvature flow, Part I
- 3:00 – 3:30 Tea Break
- 3:30 – 4:30 Natasa Sesum: Convergence and stability results for the Ricci flow, Part I

#### Tuesday September 12

- 9:30 – 10:30 Ben Weinkove: Geometric flows and moment maps, part II
- 10:00 – 10:30 Tea Break
- 11:00 – 12:00 Jiaping Wang: Sharp estimate of Green's function and applications  
Abstract: We will establish a sharp integral decay estimate of the minimal positive Green's function on a complete manifold with positive spectrum. Some applications will also be discussed.
- 12:00 – 2:00 Lunch
- 2:00 – 3:00 Natasa Sesum: Convergence and stability results for the Ricci flow, part II
- 3:00 – 3:30 Tea Break
- 3:30 – 4:30 Lei Ni: Ricci flow and invariant cones

#### Wednesday September 13

- 9:30 – 10:30 Tom Ilmanen: TBA, Part I
- 10:00 – 10:30 Tea Break
- 11:00 – 12:00 Andre Neves: Lagrangian mean curvature flow, Part II
- 12:00 – 2:00 Lunch
- No talks in the afternoon

#### Thursday September 14

- 9:30 – 10:30 Tom Ilmanen: TBA, Part II
- 10:00 – 10:30 Tea Break
- 11:00 – 12:00 Jian Song: The Kaehler-Ricci flow on surfaces, Part I  
Abstract: We study the Kaehler-Ricci flow on minimal surfaces of Kodaira dimension one and show that the flow collapses and converges to a unique canonical metric on its canonical model. Such a canonical metric is a generalized Kaehler-Einstein metric. Combining the results of Cao, Tsuji, Tian and Zhang, we give a metric classification for Kaehler surfaces with a numerically effective canonical line bundle

by the Kaehler-Ricci flow. In general, we propose to find canonical metrics on the canonical models of projective varieties of positive Kodaira dimension. This is a joint work with G. Tian.

12:00 – 2:00

Lunch

2:00 – 3:00

Albert Chau: Uniformization of complete non-compact Kaehler manifolds and the Kaehler Ricci flow, Part I

### **Friday September 15**

9:30 – 10:30

Jian Song: The Kaehler-Ricci flow on surfaces, Part II

10:00 – 10:30

Tea Break

11am – 12:00

Albert Chau: Uniformization of complete non-compact Kaehler manifolds and the Kaehler Ricci flow, Part II

12:00 – 2:00

Lunch

2:00 – 3:00

Zhou Zhang: Kaehler-Ricci Flows over Manifolds of General Type