

WORKSHOP(勉強会)

GEOMETRIC ANALYSIS IN GEOMETRY AND TOPOLOGY 2013

日時：2013年10月15日(火) – 17日(木)
場所：東京大学・数理科学研究科棟(駒場)・002号室

外国人4人による各1時間×3回の survey 講演を予定しています。

講演予定者：

- Clara Lucia Aldana (Université de Nantes)
- Ben Andrews (Australian National University)
- Emmanuel Hebey (Université de Cergy-Pontoise)
- Rafe Mazzeo (Stanford University)

プログラム

10月15日(火)

10:00–11:00

Ben Andrews (Australian National University)

“ Isoperimetric profile comparison in Ricci flow and curve shortening flow ”

11:30–12:30

Rafe Mazzeo (Stanford University)

“ Kähler-Einstein edge metrics I ”

12:30–14:00 昼食時間

14:00–15:00

Emmanuel Hebey (Université de Cergy-Pontoise)

“ Elliptic stability for stationary Schrödinger equations I ”

15:30–16:30

Clara Lucia Aldana (Université de Nantes)

“ Determinants of Laplacians and compactnes of isospectral closed surfaces ”

(I will explain the results of Osgood, Phillips and Sarnak from 1989)

10月16日(水)

10:00–11:00

Ben Andrews (Australian National University)
“ Bounds on modulus of continuity and the fundamental gap ”

11:30–12:30

Rafe Mazzeo (Stanford University)
“ Kähler-Einstein edge metrics II ”

12:30–14:00 昼食時間

14:00–15:00

Emmanuel Hebey (Université de Cergy-Pontoise)
“ Elliptic stability for stationary Schrödinger equations II ”

15:30–16:30

Clara Lucia Aldana (Université de Nantes)
“ Determinants of Laplacians on surfaces with singularities ”

10月17日(木)

10:00–11:00

Ben Andrews (Australian National University)
“ Non-collapsing and the Lawson and Pinkall-Sterling conjectures ”

11:30–12:30

Rafe Mazzeo (Stanford University)
“ Kähler-Einstein edge metrics III ”

12:30–14:00 昼食時間

14:00–15:00

Emmanuel Hebey (Université de Cergy-Pontoise)
“ Elliptic stability for stationary Schrödinger equations III ”

15:30–16:30

Clara Lucia Aldana (Université de Nantes)
“ Isospectrality for open manifolds and compactness ”

アブストラクト

- Ben Andrews :

アブストラクト Overall theme : Maximum principles involving functions of several points. In these lectures I will describe a collection of related ideas centred around the idea of applying maximum principles to functions involving several points, to obtain sharp control on the behaviour of geometric equations.

Lecture 1 : Isoperimetric profile comparison in Ricci flow and curve shortening flow

I will describe a remarkably powerful method involving comparing isoperimetric profiles, which allows easy proofs of the convergence of Ricci flow on a two dimensional sphere to constant curvature (modulo scaling) and of Grayson's theorem for the curve shortening flow of embedded closed curves in the plane. This is based on joint work with Paul Bryan.

Lecture 2 : Bounds on modulus of continuity and the fundamental gap

In this lecture I will show how a simple maximum principle can be applied to get sharp control on the modulus of continuity for solutions of heat equations. While the initial motivation for this method was to get short time regularity results for nonlinear heat equations, some very interesting consequences can be obtained also from the long-term behaviour: Sharp lower bounds on the first nontrivial eigenvalue follow in several contexts. By extending the ideas to control the 'modulus of concavity' of an eigenfunction, we also prove a sharp lower bound on the 'fundamental gap'. This is joint work with Julie Clutterbuck.

Lecture 3 : Non-collapsing and the Lawson and Pinkall-Sterling conjectures

In this lecture I will describe some ideas which led to Brendle's recent proof of the Lawson conjecture: The only embedded minimal torus in S^3 is the Clifford torus. The key estimate arises from work on mine on 'non-collapsing' in the mean curvature flow. I will describe this estimate and its proof, which is similar in spirit to the ideas discussed in the previous two lectures, and then show how Brendle modified it to give the Lawson conjecture. Haizhong Li and I also used these ideas to prove a conjecture made by Pinkall and Sterling about constant mean curvature tori in the three-sphere. If time allows I will also discuss more recent results for more general classes of Weingarten surfaces.

- Rafe Mazzeo : Kähler-Einstein edge metrics

アブストラクト This series of talks will focus on the existence of Kähler-Einstein metrics with edge singularities, a key step in Donaldson's program for establishing KE metrics on Fano manifolds. This relies on an interesting blend of linear and nonlinear techniques: the linear ones are drawn from geometric microlocal analysis and the nonlinear ones involve some new ways of obtaining a priori estimates for complex Monge-Ampere equations.

- Emmanuel Hebey : Elliptic stability for stationary Schrödinger equations

アブストラクト TBA

- Clara Lucia Aldana :
アブストラクト TBA
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組織員 :

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- 松尾信一郎 (大阪大学・理)
- Rafe Mazzeo (Stanford University, Foreign adviser)
- 芥川和雄 (東京工業大学・理工)