Talk Schedule

May 26th , 2021			
Time	Speaker	Title	ZOOM
9:00-9:50	Federico Rodriguez Hertz	Exponential mixing implies Bernoulli	ID：631 9155 8383 Password：12345
10:00- 10:50	Adriana da Luz	Star Flows and Invariant Manifolds	ID：631 9155 8383 Password：12345
11:00 - 11:50	Disheng Xu	Some rigidity results for (partially) hyperbolic systems on nilmanifolds	ID：631 9155 8383 Password：12345
May 27th , 2021			
9:00-9:50	Svetlana Katok	Rigidity and flexibility of entropies of boundary maps associated to Fuchsian groups	ID：674 6106 2808 Password：12345
10:00- 10:50	Cecilia Gonzalez Tokman	Lyapunov exponents for transfer operator cocycles of random interval maps	ID：674 6106 2808 Password：12345
11:00 - 11:50	Jinxin Xue	Initial Perturbation of Mean Curvature Flow	ID：674 6106 2808 Password：12345

Southern University of Science and Technology
Department of Mathematics

NEW TRENDS IN DYNAMICS SEMINAR

Exponential mixing implies Bernoulli

Prof. Federico Rodriguez Hertz

Penn State University

Time: May 26th , 2021, 09:00-09:50, Beijing time.

Venue: ZOOM ID: 631 9155 8383 password: 12345

Host： Jana Hertz, Raul Ures, Yiwei Zhang

Abstract

In this talk I plan to discuss some consequences of systems having the exponential mixing property. In particular I will address our joint work with D. Dolgopyat and A. Kanigowski showing that for diffeomorphisms, exponential mixing implies Bernoulli. If time permits, some open problems will be discussed and further research as well.

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NEW TRENDS IN DYNAMICS SEMINAR

Star Flows and Invariant Manifolds

Prof. Adriana da Luz

Universidad Federal Fluminense

Time: May 26th , 2021, 10:00-10:50, Beijing time.

Venue: ZOOM ID: 631 9155 8383 password: 12345

Host：Jana Hertz, Raul Ures, Yiwei Zhang

Abstract

A property of a dynamical system is called C^r-robust if it holds on a C^r-openset of systems. For diffeomorphisms or for non-singularflows, there are many resultsrelating C^1-robust properties and global structures of the dynamics, as hyperbolicity,partial hyperbolicity, dominated splitting.However, a difículty appears when a robust property of aow holds on a set containingrecurrent orbits accumulating a singular point. This phenomenon is mainlyunderstood in dimension 3, but in higher dimensions different tools and viewpoints are required. With Christian Bonatti we propose a general procedure for adapting the usual hyperbolic structures to this context. This allows us to recover to some extent, the relationship between the C^1-robust properties and global structures. In particular We prove that star flows are open and densely characterized by a structure in the normal space called multisingular hyperbolicity. However, as opposed to the case of diffeomorphisms, this hyperbolic structure gives us much less information on the existence and size of the stable and unstable manifolds of the points in a chain recurrence class. In this talk we will present the information we do have with respect to the size of the stable and unstable manifolds due to Lia and Gan and Yang. For multisingular hyperbolic flows we show some results that allow us to modestly improve the estimate on the size of stable and unstable manifolds and some of the consequences.

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NEW TRENDS IN DYNAMICS SEMINAR

Some rigidity results for (partially) hyperbolic systems on nilmanifolds

Prof. Disheng Xu

Peking University

Time: May 26th , 2021, 11:00-11:50, Beijing time.

Venue: ZOOM ID: 631 9155 8383 password: 12345

Host：Jana Hertz, Raul Ures, Yiwei Zhang

Abstract

In this talk we will discuss some classical algebraic defined (partially) hyperbolic systems on nilmanifolds. In particular we will show some interesting rigidity properties for them. This is a joint work with Damjanovic and Wilkinson.

Southern University of Science and Technology
Department of Mathematics

NEW TRENDS IN DYNAMICS SEMINAR

Rigidity and flexibility of entropies of boundary maps associated to Fuchsian groups

Prof. Svetlana Katok

Penn State University

Time: May 27th , 2021, 09:00-09:50, Beijing time.

Venue: ZOOM ID: 674 6106 2808 password: 12345

Host：Jana Hertz, Raul Ures, Yiwei Zhang

Abstract

Given a closed, orientable surface of constant negative curvature and genus $g \geq 2$, we study a family of generalized Bowen–Series boundary maps and their two dynamical invariants: the topological entropy and the measure-theoretic entropy with respect to their smooth invariant measure. We prove two strikingly different results: rigidity of topological entropy and flexibility of measure-theoretic entropy. The topological entropy is constant in this family and depends only on the genus of the surface. We give an explicit formula for this entropy and show that it stays constant both within our parameter space and within the Teichmüller space of the surface. The proofs use conjugation to maps of constant slope. We obtain an explicit formula for the measure-theoretic entropy that only depends on the perimeter of the $(8g-4)$-sided fundamental polygon of the surface and its genus. Using this we prove that the measure-theoretic entropy varies in the Teichmüller space and takes all values between 0 and maximum that is achieved on the surface which admits a regular fundamental (8g-4)-gon, and stays constant on a subset of the parameter space. We also compare the measure-theoretic entropy to the topological entropy of these maps and show that the smooth invariant measure is not the measure of maximal entropy. This is joint work with Adam Abrams and Ilie Ugarcovici.

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NEW TRENDS IN DYNAMICS SEMINAR

Lyapunov exponents for transfer operator cocycles of random interval maps

Prof. Cecilia Gonzalez Tokman

University of Queensland

Time: May 27th , 2021, 10:00-10:50, Beijing time.

Venue: ZOOM ID: 674 6106 2808 password: 12345

Host： Jana Hertz, Raul Ures, Yiwei Zhang

Abstract

Random dynamical systems provide useful models for systems whose evolution depends on external factors, such as noise and seasonal forcing. Transfer operator cocycles describe their evolution and encode relevant information about the systems' long-term behavior. In particular, the associated Lyapunov spectra determine rates of correlation decay to (random) equilibria, when applicable. In this talk, we rigorously approximate Lyapunov exponents for a class of random metastable maps and compare these estimates with predictions arising from a simple Ulam discretization. We also characterize the Lyapunov spectrum of a class of random analytic expanding circle maps and discuss surprising (in) stability properties of this spectrum under various system perturbations. (Joint work with Anthony Quas.)

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NEW TRENDS IN DYNAMICS SEMINAR

Initial Perturbation of Mean Curvature Flow

Prof. Jinxin Xue

Tsinghua University

Time: May 27th , 2021, 11:00-11:50, Beijing time.

Venue: ZOOM ID: 674 6106 2808 password: 12345

Host：Jana Hertz, Raul Ures, Yiwei Zhang

Abstract

We show that after a perturbation on the initial data of mean curvature flow, the perturbed flow can avoid certain non-generic singularities. This contributes to the program of dynamical approach to mean curvature flow initiated by Colding and Minicozzi. The key is to prove that a positive perturbation on initial data would drift to the first eigenfunction direction after long time. This is a joint work with Ao Sun.