

1) Title: Hausdorff dimension of divergent trajectories on product spaces  
石荣刚 (上海数学中心, 复旦大学)

Abstract: For a one parameter subgroup action on a finite volume homogeneous space, the set of points admitting divergent on average trajectories is strictly less than the manifold dimension. The question of calculating the precise dimension is the main challenge in the current time. We introduce a method which can be used to answer this question for certain product systems.

2) Title: 解析拟周期薛定谔 cocycle 的李雅普诺夫指数无一致的 Holder 连续性  
王奕倩 (南京大学)

Abstract: Avila 和 Jitomirskaya 对  $\cos$  位势和解析小位势得到了相应的拟周期薛定谔 cocycle 的李雅普诺夫指数关于能量的  $0.5$ -Holder 连续性的最佳结果。对  $k$  次三角多项式的小扰动位势, Goldstein 和 Schlag 得到了其指数为  $(1/2k-\epsilon)$ -Holder 连续性。对位势为  $k$  次三角多项式的情形, Ge 和 You 得到了指数的  $1/2k$ -Holder 连续性。大家想知道对一般的解析位势, Holder 指数是否有一致的正下界? 进一步对一般的解析位势, 能否得到指数的  $0.5$ -Holder 连续性? 最近我们构造了反例, 说明对应任意给定的 Holder 指数, 无论多小, 总存在  $k$  次多项式的解析小扰动位势, 其相应的李雅普诺夫指数关于能量的正则性低于该 Holder 连续性。该结果一定程度上说明了之前人们关于三角多项式位势的指数正则性估计是最佳的。(与 葛灵睿、许伽豪、 尤建功 合作)

3) Title: Anosov-Katok construction for quasiperiodic cocycles  
周麒 (南开大学)

Abstract: In this talk, we will talk about Anosov-Katok construction for quasiperiodic  $SL(2, \mathbb{R})$  cocycles, and its various dynamical applications, for example, the continuity of the Lyapunov exponent, the growth of the cocycles.

4) Title: Entropy and preimage sets  
朱玉峻 (厦门大学)

Abstract: For noninvertible dynamical systems, we investigate entropy via preimage sets. For a continuous map, we propose a notion of pointwise metric preimage entropy. For systems with uniform separation of preimages, we establish a variational principle between this version of pointwise metric preimage entropy and pointwise topological entropies introduced by Hurley, which answers a

question considered by Cheng and Newhouse. Under the same condition, the notion coincides with folding entropy introduced by Ruelle for differentiable maps to study the entropy production in nonequilibrium statistical mechanics. For a partially hyperbolic endomorphism on a closed manifold, we introduce notions of stable topological and metric entropies, and establish a variational principle relating them. Moreover, we also consider the upper semi-continuity for both of pointwise metric preimage entropy and stable entropy and give a version of Shannon-McMillan-Breiman Theorem for them respectively. (This is a joint work with Weisheng Wu)

5) Title: Entropy, Invariant Measures and Weak Specification-like Properties  
孙鹏 (中央财经大学)

Abstract: We study classes of systems satisfying weak specification-like properties. We show that in these classes systems with zero topological entropy must satisfy some rigid properties, while for systems with positive topological entropy their invariant measures have delicate structures, which implies existence of ergodic measures of intermediate entropies and intermediate pressures.

6) Title: The limit distribution of inhomogeneous Markov processes and Kolmogorov's problem  
柳振鑫 (大连理工大学)

Abstract: In this talk, we will talk about the limit distribution of inhomogeneous Markov processes generated by SDEs. Meantime, we will also discuss the recent progress in Kolmogorov's problem on the limit behavior of stationary distributions of diffusion processes as the diffusion tends to zero.

7) Title: Nondense orbits for affine maps and applications.  
安金鹏 (北京大学)

Abstract: Let  $f$  be an affine map on a homogeneous space  $X$  that is the quotient of a Lie group by a discrete subgroup,  $Z$  be a subset of  $X$ , and consider the set  $E(f, Z)$  of points in  $X$  whose forward orbits under  $f$  do not enter some neighborhood of  $Z$ . For important cases,  $f$  is ergodic with respect to the Haar measure on  $X$ , and hence  $E(f, Z)$  has zero measure. We will discuss a recent result stating that if  $Z$  is a countable union of submanifolds satisfying certain transversality conditions, then  $E(f, Z)$  has full Hausdorff dimension. This generalizes/unifies some previous results of Dani, Kleinbock, etc. We will

also discuss the geometric and number-theoretic applications. In particular, the result can be applied to show that for any point  $y$  in a locally symmetric space  $Y$  of noncompact type and any countable subset  $C$  of  $Y$  not containing  $y$ , the set of directions at  $y$  such that the closure of the geodesic through  $y$  in that direction does not meet  $C$  has full Hausdorff dimension in the set of all directions. This is a joint work with Lifan Guan and Dmitry Kleinbock.

- 8) Title: Understanding physical mixing processes via transfer operator approach

张一威 (华中科技大学)

Abstract: Industrial and chemical mixing processes of various kinds occur throughout nature and are vital in many technological applications. In the context of discrete dynamical systems, the transfer operator approach has been shown as a powerful tool from both theoretic and numerical view point. In this talk, I will use a toy model (i.e., the one dimensional stretch and fold map) as an example to provide a brief introduction on the relationships between the spectral properties of the associated transfer operator and the estimations of the optimal mixing rate of the mixing process. Moreover, I will address how the optimal mixing rate varies according to the stretch and fold map has "cutting and shuffling" behaviour (i.e., composing with a permutation). If time permits, I will also talk about how to interpret this problem to the eigenvalue estimations for the Random bi-stochastic matrices (free probability theory) and the locations of poles of the dynamical zeta function.

- 9) Title: Time periodic solutions of nonlinear wave equation with  $x$ -dependent coefficients

冀书关 (吉林大学)

Abstract: In this talk, we consider the time periodic solutions of nonlinear wave equation with  $x$ -dependent coefficients. Such a model arises from the forced vibrations of an inhomogeneous string and the propagation of seismic waves in nonisotropic media. We shall talk about some existence results on the time periodic solutions of such a model with different types of nonlinearity.

10) Title: Relative entropy and chaos for amenable group actions

严可颂 (广西师范大学)

Abstract: In this talk, we shall talk about some recent results about entropy and chaos for amenable group actions.

11) Title: REDUCIBILITY OF 1-D SCHRODINGER EQUATION WITH UNBOUNDED OSCILLATION PERTURBATIONS

梁振国 (复旦大学)

Abstract: We build a new estimate of oscillatory integrals relative with Hermite functions. Based on it and a new unbounded KAM theorem, we prove a new reducibility theorem, which can be applied to the linear time - dependent perturbations of the Schrodinger equations with unbounded oscillation perturbation in space variable. The new aspect is that we can deal with the following Schrodinger operator:

$$-\frac{d^2}{dx^2} + x^{2l+\varepsilon} \langle x \rangle^\mu \sin x f(\omega t),$$

which is beyond the pseudodifferential calculus methods developed by Bambusi and etc, where  $\mu < l - 1 + \frac{1}{2l+1}$  and  $l > 1$ . The above method can also be applied to 1d harmonic oscillators with unbounded oscillation perturbations.

12) Title: The Morse index Theorem of Lagrangian Systems

胡锡俊 (山东大学)

Abstract: We will introduce the recent results for the Morse index theorem and its applications.

13) Title: Minimal systems with finitely many ergodic measures

邵松 (中国科技大学)

Abstract: In this talk we will give some conditions under which a minimal system has only finitely many ergodic measures. One of main results is that if a minimal system is almost finite to one extension of its maximal equicontinuous factor and has no  $k$  infinite independent sets for some  $k > 1$ , then

it has only finitely many ergodic measures.

We also use sequence entropy to give another criteria. A topological dynamical system is called bounded if the topological sequence entropy of the system along any sequence is bounded by some positive constant. We show that any minimal bounded system is an almost finite to one extension of its maximal equicontinuous factor, and it has only finitely many ergodic measures. This is a joint work with Wen Huang, Zhengxing Lian and Xiangdong Ye.

14) Title: Harmonic brake orbits in semipositive reversible superquadratic Hamiltonian systems

张端智 (南开大学)

Abstract: In this talk, we will briefly introduce the Maslov-type index theory for brake orbits. As applications, we will study the multiplicity existence of harmonic brake orbits in semipositive reversible superquadratic Hamiltonian systems. This is a joint work with Zhiping Fan.

15) Title: Complexified Kepler Problem

孙善忠 (首都师范大学)

Abstract: Inspired by recent ideas from various branches of mathematical physics, we study the complexification of the classical planar Kepler problem and we observe the existence of the nontrivial monodromy of the energy-momentum mapping which has potential quantum mechanics implications yet to be clarified.

16) Title: Entropy and Emergence in topological dynamical systems

陈二才 (南京师范大学)

Abstract: A concept of emergence was recently introduced by P. Berger and developed by P. Berger and J. Bochi. Inspired by these, we introduce a notion of super entropy and reveal the relationship between super entropy and topological entropy, that is, the topological entropy of a dynamical system equals to the super entropies of induced dynamical systems  $(\mathcal{M}(X), f_{\mathcal{M}})$  and  $(\mathcal{K}(X), f_{\mathcal{K}})$ .

17) Title: Margulis-Ruelle inequality for general manifolds

廖刚 (苏州大学)

Abstract: We investigate the Margulis-Ruelle inequality for general Riemannian manifolds (possibly noncompact and with boundary) and show that this inequality always holds under integrable condition.

18) Title: On the number of zeros of Abelian Integrals

肖冬梅 (上海交通大学)

Abstract: In this talk, we will introduce some new methods to estimate the lowest upper bound of the number of isolated zeros of Abelian integrals, which is called the weakened 16th Hilbert problem proposed by V. I. Arnold. Some algebraic criteria are obtained for the number of isolated zeros of Abelian integrals along energy level ovals of potential systems. As applications of our main results, we study three kinds of Abelian integrals along algebraic or non-algebraic level ovals, obtain the algebraic criteria on the Abelian integrals having Chebyshev property with accuracy one, simplify some known proof on the cyclicity of quadratic reversible centers, and give all the configurations of limit cycles from Poincaré bifurcation of two quadratic reversible systems with two centers, one of which has a non-algebraic first integral with logarithmic function. This talk is based on the joint works with Changjian Liu.

19) Title: BCZ map is weakly mixing

张翼华 (清华大学)

Abstract. The BCZ map is a piecewise linear map introduced by number theorists Boca, Cobelli and Zaharescu to study the distribution of Farey sequences. It was later discovered by Athreya and the speaker to be a section of the horocycle flow on the modular surface, whereby ergodicity, 0-entropy were established. In this talk I will describe joint work with Anthony Quas that establishes weak mixing. The question of mixing remains open.

20) Title: Singularities from Hamilton-Jacobi

程伟（南京大学）

摘要：我们将讨论关于 Hamilton-Jacobi 方程的粘性解的奇性的相关问题，包括奇性的在 Hamilton 动力学中的意义，奇性的传播，割迹与经典动力学的联系。这些主要基于我们与 Cannarsa, Fathi, 王楷植、陈秦波和陈翠等的工作

Title: On the dynamics of a class of uniformly hyperbolic skew-product systems

21) 连增（四川大学）

Abstract: In this talk, I will report some recent development on the dynamics of a class of uniformly hyperbolic skew-product systems such as existence of random periodic orbit and random horseshoe. This work is joint with Lu Kening and Huang Wen.

22) Title: Some results on solution semigroups in Hamilton-Jacobi equations and systems

金亮（南京理工大学）

Abstract: In this talk, we shall introduce the notion of solution semigroup associated to the Cauchy problem of Hamilton-Jacobi equation and equation systems of convex type and then present some of our recent results mainly concerning

- 1) The convergence of  $l$ -graph associated to the solution semigroup in the equation case;
- 2) The application of solution semigroup in the study of regularizing effects in the system case.

23) Title: 切触Hamilton系统的全局动力学与Hamilton-Jacobi方程的粘性解

王林（清华大学）

摘要：基于与合作者发展的作用量极小方法，我会介绍切触Hamilton系统全局极小轨道的动力学行为及其与Hamilton-Jacobi方程粘性解的联系，进而介绍切触系统有别于经典Hamilton系统的一些新现象。

24) Title: Long time stability of Hamiltonian DNLS equations

张静（华东师范大学）

Abstract: In this talk, we will consider some types of Hamiltonian DNLS equations with periodic boundary conditions. When its initial value of the solution is small, we will research the behavior of the corresponding solutions during a long-time interval. We will change these problems into consider the solution around origin point to an infinite dimension nearly integrable Hamiltonian systems. The main methods are Birkhoff normal theory and energy estimate.

25) Title: Oscillatory orbits of restricted planar 4 body problem

张建路 (中科院)

Abstract: for a typical model of planar 4 body problem, we construct the oscillatory orbits under an improved rotating coordinate and show the robustness of this construction. Besides, this construction can be applied to the further exploration of diffusion orbits.