



# Kleines Seminar, RCOA at ECNU

学年 2020年秋季学期, 2020年9月14日至2021年1月24日, 共19周

地点 线上 Zoom 会议及线下理科大楼 A 座 5 楼 (暂定) 时间 周一上午 10 点

报告者	报告内容
郭亮	9月17日; Localization algebras and the coarse Baum-Connes conjecture, Guoliang Yu
罗政	9月28日; A Bott periodicity theorem for infinite-dimensional Euclidean space, Nigel Higson, Gennadi Kasparov and Jody Trout
张亚洲	10月12日; Connes' analogue for crossed products of the Thom isomorphism, Marc Rieffel
王子竞	10月19日; Witten's approach to Morse Theory, John Roe
刘一凡	10月26日; Subnormal Operators, Conway
张超华	11月9日; $K$ -homology and Fredholm operators I: Dirac operators, Paul Baum, Erik van Erp
韦斯翰	11月16日; Minimal dynamical systems and approximate conjugacy, Huaxin Lin, Hiroki Matui
周大鹏	11月23日; Quantitative $K$ -theory, positive scalar curvature and band width, Hao Guo, Zhizhang Xie, Guoliang Yu
王苍园	11月30日; $K_1$ -injectivity of $C^*$ -algebras, Randi Rohde





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地点 线上腾讯会议 ID 329 8591 7934 及线下 (暂定) 时间 周一上午10点

报告者	报告内容
王若飞	12月7日; Hilbert $C^*$ -modules, E. C. Lance
张建国	12月14日; Künneth formula for $K$ -theory, M. F. Atiyah; C. Schochet
郭亮	12月21日; On the localization algebra of Guoliang Yu, J. Roe, Y. Qiao
罗政	12月28日; A Bott periodicity theorem for infinite-dimensional Euclidean space, N. Higson, G. Kasparov and J. Trout
张亚洲	1月4日; Isoperimetric inequality on hyperbolic groups, M. Gromov
王子竞	1月11日; The Lefschetz formula, J. Roe
张超华	1月18日; Kasparov's $K$ -homology, N. Higson, J. Roe





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学年 2021年春季学期, 2021年3月1日至2021年7月4日, 共18周

地点 线上腾讯会议 ID 329 8591 7934 及线下 (暂定) 时间 周五上午10点

报告者/时间	报告内容
韦斯翰 3月19日	<p>Title: Classification of minimal dynamical systems and approximate conjugacy</p> <p>Abstract: Let <math>(X, \alpha)</math> and <math>(X, \beta)</math> be two minimal dynamical systems on a compact metric space <math>X</math>. In 1995, Jun Tomiyama shows that <math>(X, \alpha)</math> and <math>(X, \beta)</math> are flip conjugate if and only if there is a unital isomorphism between the crossed products <math>C^*(X, \alpha)</math> and <math>C^*(X, \beta)</math> keeping their masa. On the other hand, inheriting the philosophy of Tomiyama's classification theorem, H. Lin and H. Matui defined the concepts of approximate <math>K</math>-conjugacy and <math>C^*</math>-strongly approximate conjugacy in 2004, and showed that for Cantor minimal systems, the approximate <math>K</math>-conjugacy and <math>C^*</math>-strongly approximately conjugacy coincide with the strong orbit equivalence defined by T. Giordano, F. Putnam and C. Skau. Furthermore, it is also equivalent to a <math>K</math>-version of Tomiyama's commutative diagram.</p> <p>In quick succession, this is also shown to be the case for certain kind of minimal rigid dynamical systems on the product of the Cantor space and the circle by H. Lin and H. Matui, and on the product of the Cantor space and the torus by W. Sun. Therefore, in a paper of H. Lin and N. Phillips, H. Lin asked that, what additional hypothesis are required for <math>\alpha</math> and <math>\beta</math> (and of course, <math>X_1</math> and <math>X_2</math>) such that the approximate <math>K</math>-conjugacy and <math>C^*</math>-strongly approximate conjugacy are</p>



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equivalent?

In this talk, we define the Lipschitz-minimal-property (LMP) for a compact metric space. Then upon applying the technique developed by S. Glasner and B. Weiss, for proving the existence of skew minimal products, we answer the question of H. Lin by showing that, for any Cantor minimal system  $(K, \alpha)$  and any infinite finite-dimensional connected finite CW-complex  $\Omega$  with the LMP, there is an uncountable class  $R_0(\alpha)$  of minimal skew products on  $K \times \Omega$  such that, with the additional condition that  $K_0(C(\Omega))$  is torsion free and  $K_1(C(\Omega)) = 0$ , for any two minimal rigid homeomorphisms  $\alpha \in R_0(\alpha)$  and  $\beta \in R_0(\beta)$ , the approximate  $K$ -conjugacy and the  $C^*$ -strongly approximate conjugacy coincide, which are also equivalent to the  $K$ -version of Tomiyama's commutative diagram. This includes the cases that  $\Omega$  is an even-dimensional sphere  $S^{2n}$  or a product of even dimensional spheres of different dimensions. However, note that the even-dimensional spheres admit no minimal homeomorphism.

The case that  $K_1(C(\Omega))$  is not necessarily trivial is also considered, where we get a corresponding classification result. This covers the situation that  $\Omega$ =circle considered by H. Lin and that  $\Omega$ =torus considered by W. Sun.



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地点 线上腾讯会议 ID 329 8591 7934 及线下 (暂定) 时间 周五上午 10 点

报告者/时间	报告内容
Valerio Proietti	Title: On the K-theory of groupoids acting properly Tentative plan for 5 lectures:
1/5: 3月26日	1. Preliminaries on (proper) groupoids, $C^*$ -dynamical systems and equivalence theorems
2/5: 4月2日	2. Induction-Restriction adjunction in KK-theory
3/5: 4月23日	
4/5: 5月14日	
5/(5+x): 5月21日	3. Basics on triangulated categories, pairs of complementary subcategories and their relevance in K-theory
6/(5+2): 6月4日	4. The Baum-Connes conjecture and the Dirac-dual-Dirac method
	5. Applications





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王若飞 4月9日	Distance between unitary orbits
郭亮 4月16日	On warped products of CAT(0) spaces; Warped products of metric spaces of curvature bounded from above, Chien-Hsiung Chen
罗政 5月7日	The coarse geometric Novikov conjecture for spaces of non-positive curved manifolds
张亚洲 5月28日	Infinitely presented small cancellation groups have the Haagerup property, G. Arzhantseva, D. Osajda
王子竞 6月18日	Atiyah's $\Gamma$ -index theorem, J. Roe
张超华 7月2日	A note on the relative index theorem, J. Roe





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学年 2021年秋季学期, 2021年9月6日至2022年1月7日, 共18周

地点 线上腾讯会议 ID 329 8591 7934 及线下 (暂定) 时间 周三上午 10 点

报告者/时间	报告内容
韦斯翰 9月29日	题目: 拓扑动力系统和混沌系统 (On topological dynamical systems and chaotic systems) ; 摘要: 我们主要讨论讨论拓扑动力系统里关于混沌理论的一些基本概念和经典的定理, 例如 Li-Yorke 混沌性和灵敏性, 极小性, 传递性, 强混合性, 拓扑动力系统的熵等等, 并看看它可以和算子代数有怎么样的关系。
王若飞 10月13日	The tracial topological rank; The tracial topological rank of $C^*$ -algebras, Huaxin Lin
郭亮 10月20日	Counterexamples to the coarse Baum-Connes conjecture; Higher index theory, Rufus Willett, Guoliang Yu
罗政 11月3日	The coarse Novikov conjecture and Banach spaces with Property (H); Xiaoman Chen, Qin Wang, Guoliang Yu
张亚洲 11月10日	Embeddable box spaces of free groups; A. Khukhro

