



**The 21st (第廿一届)**  
**Special Week on Operator Algebras**

**August 3rd – August 7th, 2026**

**SHANGHAI, CHINA**



Hosted by

**Shanghai Institute for Mathematics and Interdisciplinary Sciences**

Co-organized by

Shanghai Center for Mathematical Sciences, Fudan University

Research Center for Operator Algebras, East China Normal University

# Calendar

|                            | Mon (08/03)                                       | Tue (08/04)       | Wed (08/05)                    | Thu (08/06)              | Fri (08/07)               |
|----------------------------|---------------------------------------------------|-------------------|--------------------------------|--------------------------|---------------------------|
| 09:00–09:50                | <b>Opening &amp; Guoliang Yu</b><br>(08:45–10:05) | <b>Liming Ge</b>  | <b>Ruy Exel</b>                | <b>Guihua Gong</b>       | <b>Stuart White</b>       |
| chair                      | Huaxin Lin                                        | Guoliang Yu       | Huaxin Lin                     | Yuhei Suzuki             | Jianchao Wu               |
| Tea Break<br>09:50–10:20   | (10:05–10:35)                                     |                   |                                |                          |                           |
| 10:20–11:10                | <b>Zhengwei Liu</b><br>(10:35–11:25)              | <b>Xiang Tang</b> | <b>N. Christopher Phillips</b> | <b>Vladimir Manuilov</b> | <b>Shintaro Nishikawa</b> |
| chair                      | Feng Xu                                           | Guoliang Yu       | Guihua Gong                    | Yuhei Suzuki             | Jianchao Wu               |
| 11:20–12:10                | <b>Yi-Jun Yao</b><br>(11:35–12:25)                | <b>Hang Wang</b>  | <b>Yuhei Suzuki</b>            | <b>Shanshan Hua</b>      | <b>Xin Ma</b>             |
| chair                      | Feng Xu                                           | Guoliang Yu       | Guihua Gong                    | Yuhei Suzuki             | Jianchao Wu               |
| Lunch Break<br>12:10–14:00 | (12:25–14:00)                                     |                   |                                |                          | Closing Lunch             |
| 14:00–14:50                | <b>Dmitriy Zanin</b>                              | <b>Hanfeng Li</b> | <b>Feng Xu</b>                 | Free Afternoon           | <b>Bin Gui</b>            |
| chair                      | Xiang Tang                                        | Vladimir Manuilov | Hang Wang                      |                          | Qin Wang                  |
| Tea Break<br>14:50–15:20   |                                                   | Group Photo       |                                |                          |                           |
| 15:20–16:10                | <b>Zhichao Liu</b>                                | <b>Sayan Das</b>  | <b>Jinmin Wang</b>             |                          | <b>Yongle Jiang</b>       |
| chair                      | Xiang Tang                                        | Vladimir Manuilov | Hang Wang                      |                          | Qin Wang                  |
| 16:20–17:10                | <b>Kang Li</b>                                    | <b>Qingnan An</b> | <b>Jintao Deng</b>             |                          |                           |
| chair                      | Xiang Tang                                        | Vladimir Manuilov | Hang Wang                      |                          |                           |
| 17:30–                     | Dinner                                            | Dinner            | Banquet                        |                          |                           |

### **Organizers:**

Huaxin Lin (Shanghai Institute for Mathematics and Interdisciplinary Sciences)

Jianchao Wu (Shanghai Center for Mathematical Sciences, Fudan University)

Hang Wang (East China Normal University)

Qin Wang (East China Normal University)

Sayan Das (East China Normal University)

### **Speakers:**

Qingnan An (Northeast Normal University)

Sayan Das (East China Normal University)

Jintao Deng (Shanghai University of Finance and Economics)

Ruy Exel (Universidade Federal de Santa Catarina)

Liming Ge (Institute of Mathematics, Chinese Academy of Sciences; University  
of New Hampshire)

Guihua Gong (Shanghai University of Finance and Economics)

Bin Gui (Tsinghua University)

Shanshan Hua (University of Münster)

Yongle Jiang (Dalian University of Technology)

Hanfeng Li (Chongqing University)

Kang Li (Lund University)

Zhengwei Liu (BIMSA; Tsinghua University)

Zhichao Liu (Dalian University of Technology)

Xin Ma (IASM at Harbin Institute of Technology)

Vladimir Manuilov (Moscow State University)

Shintaro Nishikawa (University of Southampton)

N. Christopher Phillips (University of Oregon)

Yuhei Suzuki (Hokkaido University)

Xiang Tang (Washington University in St. Louis)

Hang Wang (East China Normal University)

Jinmin Wang (Institute of Mathematics, Chinese Academy of Sciences)

Stuart White (University of Oxford)

Feng Xu (University of California, Riverside)

Yi-Jun Yao (Fudan University)

Guoliang Yu (Texas A&M University)

Dmitriy Zanin (Central South University; University of New South Wales)

## **Schedule**

### **Location**

The Auditorium on the **18th Floor**, Shanghai Institute for Mathematics and Interdisciplinary Sciences (SIMIS)

### **Zoom Access for the Opening Session**

The opening session will be streamed live via Zoom.

Meeting ID: 884 4499 1609

Passcode: 076383

### **Zoom Access for the Conference**

All talks throughout the conference will be streamed live via Zoom.

Meeting ID: 871 2767 9322

Passcode: 063652

## Schedule of the talks (Beijing time)

| <b>Monday, August 3</b>  |                                                                                                                  |
|--------------------------|------------------------------------------------------------------------------------------------------------------|
| <i>Chair: Huaxin Lin</i> |                                                                                                                  |
| 08:45 – 10:05            | Opening & Guoliang Yu: <i>Simplicial Volume and Positive Scalar Curvature</i>                                    |
| 10:05 – 10:35            | Tea Break                                                                                                        |
| <i>Chair: Feng Xu</i>    |                                                                                                                  |
| 10:35 – 11:25            | Zhengwei Liu: <i>Functional Integral Construction of Topological Quantum Field Theory</i>                        |
| 11:35 – 12:25            | Yi-Jun Yao: <i>Quantization of Symplectic Actions and Deformation Theory</i>                                     |
| 12:25 – 14:00            | Lunch Break                                                                                                      |
| <i>Chair: Xiang Tang</i> |                                                                                                                  |
| 14:00 – 14:50            | Dmitriy Zanin: <i>Principal symbol calculus on contact manifolds: <math>C^*</math>-algebraic approach</i>        |
| 14:50 – 15:20            | Tea Break                                                                                                        |
| 15:20 – 16:10            | Zhichao Liu: <i>Classification of homomorphisms into simple <math>C^*</math>-algebras with strict comparison</i> |
| <i>Chair: Xiang Tang</i> |                                                                                                                  |
| 16:20 – 17:10            | Kang Li: <i>Maximal Ideals of Reduced Group <math>C^*</math>-Algebras and Applications to Thompson's Groups</i>  |
| 17:30 –                  | Dinner                                                                                                           |

| <b>Tuesday, August 4</b>        |                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------|
| <i>Chair: Guoliang Yu</i>       |                                                                                      |
| 09:00 – 09:50                   | Liming Ge: <i>Thompson Groups, Semigroups, Operator Algebras and Number Theory</i>   |
| 09:50 – 10:20                   | Tea Break                                                                            |
| <i>Chair: Guoliang Yu</i>       |                                                                                      |
| 10:20 – 11:10                   | Xiang Tang: <i>Higher Lefschetz formulas on <math>\Gamma</math>-proper manifolds</i> |
| 11:20 – 12:10                   | Hang Wang: <i>Euler Characteristic and Higher Kazhdan Projections</i>                |
| 12:10 – 14:00                   | Lunch Break                                                                          |
| <i>Chair: Vladimir Manuilov</i> |                                                                                      |
| 14:00 – 14:50                   | Hanfeng Li: <i>Permanents and restricted permutations</i>                            |
| 14:50 – 15:20                   | Tea Break & Group Photo                                                              |
| 15:20 – 16:10                   | Sayan Das: <i>On Connes' Rigidity Conjecture</i>                                     |
| 16:20 – 17:10                   | Qingnan An: <i>Bockstein operations and total K-theory</i>                           |
| 17:30 –                         | Dinner                                                                               |

| <b>Wednesday, August 5</b> |                                                                                                      |
|----------------------------|------------------------------------------------------------------------------------------------------|
| <i>Chair: Huaxin Lin</i>   |                                                                                                      |
| 09:00 – 09:50              | Ruy Exel: <i>Consonant Inverse Semigroups</i>                                                        |
| 09:50 – 10:20              | Tea Break                                                                                            |
| <i>Chair: Guihua Gong</i>  |                                                                                                      |
| 10:20 – 11:10              | N. Christopher Phillips: <i>An isomorphism theorem for infinite reduced free products</i>            |
| 11:20 – 12:10              | Yuhei Suzuki: <i>Stabilization theorem and symmetric structure of Cuntz–Pimsner algebras</i>         |
| 12:10 – 14:00              | Lunch Break                                                                                          |
| <i>Chair: Hang Wang</i>    |                                                                                                      |
| 14:00 – 14:50              | Feng Xu: <i>On singular limits of relative entropies</i>                                             |
| 14:50 – 15:20              | Tea Break                                                                                            |
| <i>Chair: Hang Wang</i>    |                                                                                                      |
| 15:20 – 16:10              | Jinmin Wang: <i>Complete metric with positive scalar curvature on punctured aspherical manifolds</i> |
| 16:20 – 17:10              | Jintao Deng: <i>The relative Novikov conjecture</i>                                                  |
| 17:30 –                    | Banquet                                                                                              |

| <b>Thursday, August 6</b>  |                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Chair: Yuhei Suzuki</i> |                                                                                                                                                |
| 09:00 – 09:50              | Guihua Gong: <i>Invariant and classification of simple amenable <math>\mathbb{Z}</math>-stable <math>C^*</math>-algebras and homomorphisms</i> |
| 09:50 – 10:20              | Tea Break                                                                                                                                      |
| <i>Chair: Yuhei Suzuki</i> |                                                                                                                                                |
| 10:20 – 11:10              | Vladimir Manuilov: <i>On <math>K</math>-theory of Roe algebras</i>                                                                             |
| 11:20 – 12:10              | Shanshan Hua: <i>Acyclic Groups as a Toolkit in Operator Algebras</i>                                                                          |
| 12:10 – 14:00              | Lunch Break                                                                                                                                    |
| 14:00 –                    | Free Afternoon                                                                                                                                 |

| <b>Friday, August 7</b>   |                                                                                                                              |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <i>Chair: Jianchao Wu</i> |                                                                                                                              |
| 09:00 – 09:50             | Stuart White: <i>Infinite reduced free products of nuclear <math>C^*</math>-algebras</i>                                     |
| 09:50 – 10:20             | Tea Break                                                                                                                    |
| <i>Chair: Jianchao Wu</i> |                                                                                                                              |
| 10:20 – 11:10             | Shintaro Nishikawa: <i>Power operations in equivariant <math>KK</math>-theory and Baum–Connes for finite wreath products</i> |
| 11:20 – 12:10             | Xin Ma: <i>Finite dynamical asymptotic dimension for tiling groupoids and the applications to time-frequency analysis</i>    |
| 12:10 – 14:00             | Closing Lunch                                                                                                                |
| <i>Chair: Qin Wang</i>    |                                                                                                                              |
| 14:00 – 14:50             | Bin Gui: <i>Unitary non-rational conformal field theory</i>                                                                  |
| 14:50 – 15:20             | Tea Break                                                                                                                    |
| 15:20 – 16:10             | Yongle Jiang: <i>On the classification of invariant random von Neumann subalgebras</i>                                       |

## Abstracts

### Qingnan An (Northeast Normal University)

**Title:** *Bockstein operations and total K-theory*

**Abstract:** We will introduce total K-theory together with the Bockstein operations, which form a natural module structure for the invariant. We are going to show their application of for classification of  $C^*$ -algebras. More concretely, we will give some construction to show how the Bockstein operations are necessary for the classification of AHD algebras and the extensions of AHD algebras. This is based on joint works with Zhichao Liu.

### Sayan Das (East China Normal University)

**Title:** *On Connes' Rigidity Conjecture*

**Abstract:** Let  $G$  be an i.c.c. property (T) group, and let  $L(G)$  denote the corresponding group von Neumann algebra. In 1980s Alain Connes conjectured that i.c.c. property (T) groups are  $W^*$ -superrigid, i.e., if  $L(G)$  is isomorphic to  $L(H)$  then  $G$  must be isomorphic to  $H$ . I will survey some recent developments on this Rigidity Conjecture. I will also present the first examples of property (T) group factors with trivial fundamental group. This talk is partly based on a joint work with Chifan, Houdayer and Khan.

### Jintao Deng (Shanghai University of Finance and Economics)

**Title:** *The relative Novikov conjecture*

**Abstract:** The geometry of a compact manifold with boundary is intimately linked to the fundamental groups of the manifold and its boundary, together with the inclusion-induced map between them. Elliptic operators on such manifolds give rise to relative higher indices, which take values in the K-theory of the relative group  $C^*$ -algebra. The relative Novikov conjecture provides a topological criterion for the vanishing of these indices, and it is a condition intimately tied to the existence of positive scalar curvature metrics. In this talk, I will present the formulation of the relative Novikov conjecture for pairs of groups, and talk about our results. This is based on a joint work with T. Geng, Z. Xie, and G. Yu.

### Ruy Exel (Universidade Federal de Santa Catarina)

**Title:** *Consonant Inverse Semigroups*

**Abstract:** Given an inverse semigroup  $S$ , there are two natural  $C^*$ -algebras associated to  $S$ , namely the universal  $C^*$ -algebra, introduced by Duncan and Patterson in 1985, and the tight  $C^*$ -algebra, introduced by the speaker in 2008. On the other hand, many important  $C^*$ -algebras are generated by an inverse semigroup, such as Cuntz-Krieger algebras, graph  $C^*$ -algebras,

higher rank graph  $C^*$ -algebras,  $C^*$ -algebras associated to subshifts,  $C^*$ -algebras of tiling spaces and many others. In most cases these algebras turn out to coincide with the tight  $C^*$ -algebra of the generating inverse semigroup, rather than the universal one. The tight  $C^*$ -algebra of an inverse semigroup  $S$  may be constructed as the groupoid  $C^*$ -algebra of a certain groupoid, called the tight groupoid of  $S$ . In this talk, after a brief introduction to the general theory of tight  $C^*$ -algebras, we will discuss necessary and sufficient conditions for the tight groupoids of two given inverse semigroups to be isomorphic. Time permitting, we will also discuss necessary and sufficient conditions on a topological groupoid for it to be isomorphic to the tight groupoid of an inverse semigroup.

### **Liming Ge (Institute of Mathematics, Chinese Academy of Sciences; University of New Hampshire)**

**Title:** *Thompson Groups, Semigroups, Operator Algebras and Number Theory*

**Abstract:** This talk explores bridges between operator algebras and number theory using non-commutative arithmetic. We begin with the Thompson group and its associated semigroup, define a zeta function on this semigroup, show its analytic continuation beyond the natural boundary, and derive a noncommutative analogue of the prime number theorem. Next, we study the abelian semigroup generated by  $n$ -square plus 1; despite its non-unique factorization, we obtain sharp counting estimates and prove that its Dirichlet series has a zero in the right half-plane. Finally, we examine subsemigroups generated by primes in prescribed residue classes modulo three. By comparing their divisor sums, we find a significant asymptotic bias, with one class contributing only about one sixth of the other. The talk ends with a selection of open problems linking these topics.

### **Guihua Gong (Shanghai University of Finance and Economics)**

**Title:** *Invariant and classification of simple amenable  $Z$ -stable  $C^*$ -algebras and homomorphisms*

**Abstract:** In this lecture, I will present the classification theorem of simple projectionless  $C^*$ -algebras. This is a joint work with Huaxin Lin.

### **Bin Gui (Tsinghua University)**

**Title:** *Unitary non-rational conformal field theory*

**Abstract:** In the past three decades, the operator-algebraic approach to 2d unitary conformal field theory (CFT) has focused primarily on rational CFT, owing to its close relationship with the theory of finite-index subfactors. In rational CFT, the state space has a finite spectrum; that is, it decomposes into finitely many irreducible representations with respect to its symmetry

algebra. More recently, however, important models of non-rational unitary CFTs with continuous spectra, most notably Liouville CFT, have been rigorously constructed using probabilistic methods. In this talk, I will explain how both finite-type and continuous-type unitary CFTs can be understood within the operator-algebraic framework. The talk is based on the paper 2606.30928

## Shanshan Hua (University of Münster)

**Title:** *Acyclic Groups as a Toolkit in Operator Algebras*

**Abstract:** A group is called acyclic if its integral homology vanishes in all positive degrees. In joint work with Curda and Slutsky, we use torsion-free acyclic groups as a tool to address three problems in  $C^*$ -algebras.

First, we construct the first known torsion-free groups that fail  $C^*$ -superrigidity, which means that their reduced group  $C^*$ -algebras are isomorphic to those of non-isomorphic groups. Second, we obtain commutative dynamical models for two fundamental strongly self-absorbing  $C^*$ -algebras, the Jiang-Su algebra  $\mathcal{Z}$  and the Cuntz algebra  $\mathcal{O}_\infty$ . More precisely, we realize each as a crossed product associated to an action of a torsion-free acyclic group on a compact metrizable space. Finally, using Bernoulli-shift actions of amenable, torsion free, acyclic groups on  $\mathcal{Z}$ , we construct noncommutative crossed-product models for all classifiable  $C^*$ -algebras, thereby resolving Problem XLVI in Schafhauser-Tikuisis-White's "Nuclear  $(C^*)$ -Algebras: 99 Problems".

## Yongle Jiang (Dalian University of Technology)

**Title:** *On the classification of invariant random von Neumann subalgebras*

**Abstract:** Let  $G$  be a countable discrete group. The conjugation action of  $G$  on  $L(G)$  induces an action on the space of von Neumann subalgebras of  $L(G)$ . An invariant Borel probability measure on this space under this action is called an invariant random von Neumann subalgebra (IRA for short), a concept introduced in the work of Amrutam-Hartman-Oppelmayer. In this talk, we present some classification results on IRA. Based on joint work with several people including Amrutam, Dudko, Glasner, Hartman, Skalski, Li, Liu, Xu and Zhou.

## Hanfeng Li (Chongqing University)

**Title:** *Permanents and restricted permutations*

**Abstract:** The permanent of a square matrix is defined similar to its determinant, without signs on the products of entries. I will introduce a notion of permanent for elements of the group ring of an infinite amenable group with non-negative real coefficients, and compare it with the Fuglede-Kadison determinant. I will also discuss why the permanent computes the topological

pressure of the subshifts associated to restricted permutations. This is based on a joint work with Klaus Schmidt.

### **Kang Li (Lund University)**

**Title:** *Maximal Ideals of Reduced Group  $C^*$ -Algebras and Applications to Thompson's Groups*

**Abstract:** In this talk, I will present joint work with Kevin Aguyar Brix, Chris Bruce, and Eduardo Scarparo on the ideal structure of reduced group  $C^*$ -algebras. We develop a general framework for comparing ideals using a conditional expectation onto a  $C^*$ -subalgebra. In this setting, induction of ideals and a complementary operation called co-induction form a Galois connection between ideal lattices. We apply this framework to reduced group  $C^*$ -algebras arising from actions of discrete groups on their Furstenberg boundary. Using boundary stabilizers, we obtain a characterization of maximal ideals in terms of maximal co-induced ideals. As applications, we show that the reduced  $C^*$ -algebra of Thompson's group  $T$  has a unique maximal ideal, and that if Thompson's group  $F$  is amenable, then the reduced  $C^*$ -algebra of  $T$  has infinitely many ideals. If time permits, I will also present a follow-up result building on these ideas.

### **Zhengwei Liu (Tsinghua University; BIMSA)**

**Title:** *Functional Integral Construction of Topological Quantum Field Theory*

**Abstract:** We provide an topological analogue of the Osterwalder-Schrader construction on  $n$ -dimensional lattice models for any  $n$ . From the higher representation theory of higher operator algebras, an unitary  $n$ -category will be an emergent symmetry describing the interactions of defects. Then we construct an  $n+1$  alterfold topological quantum field theory (TQFT) to characterize the bulk-boundary theory with space-time boundary and defects. This framework unifies a large amount of concepts and remarkable results in TQFT, subfactor theory, quantum information, topological orders, category theory. Several fundamental questions are solved. More will be proposed.

### **Zhichao Liu (Dalian University of Technology)**

**Title:** *Classification of homomorphisms into simple  $C^*$ -algebras with strict comparison*

**Abstract:** In this talk, I will report some recent progress in the classification theory and explore the classification of homomorphisms from  $C(X)$  to simple AF-algebras using the Cuntz semigroup. We provide some new insights into the relationship between the Cuntz semigroup and the distance between unitary orbits.

## **Xin Ma (IASM at Harbin Institute of Technology)**

**Title:** *Finite dynamical asymptotic dimension for tiling groupoids and the applications to time-frequency analysis*

**Abstract:** In this talk, I will demonstrate the finite dynamical asymptotic dimension for tiling groupoids constructed from certain Delone sets in Euclidean spaces. This first resolve a question left in the thesis of Ito. As a consequence, this provides finite nuclear dimension of the corresponding twisted groupoid  $C^*$ -algebras. Then I will show one can use this result (with some help using Hilbert  $C^*$ -module) to obtain Balian-Low type characterization of existence of certain Gabor frames (and Riesz sequences) for non-uniform sampling (and Interpolations) on the Euclidean spaces by covolume of the Delone set. This is based on joint work with Rui Liu and Yuxuan Zheng.

## **Vladimir Manuilov (Moscow State University)**

**Title:** *On  $K$ -theory of Roe algebras*

**Abstract:** Roe algebras are natural noncommutative  $C^*$ -algebras associated with metric spaces in the spirit of Connes' noncommutative geometry. For example, the Wannier projection for the Schrödinger operator with a potential that vanishes at an infinite discrete set of points in a noncompact manifold lies in the Roe algebra of the manifold. We show that the class of this projection in the  $K$ -theory of the Roe algebra is zero. The proof uses graphs with vertices at the set of zeros of the potential. Along the way, natural maps from the homology of a graph to the  $K$ -theory of its Roe algebra are obtained.

## **Shintaro Nishikawa (University of Southampton)**

**Title:** *Power operations in equivariant  $KK$ -theory and Baum–Connes for finite wreath products*

**Abstract:** I will discuss a finite-power construction in equivariant  $KK$ -theory motivated by permanence questions for the Baum–Connes conjecture with coefficients. Equivariant tensor powers of Kasparov cycles require rebuilding the Kasparov operator itself. The analytic heart is a symmetric refinement of the Kasparov technical theorem on a tensor-product module. I will explain the relation with the ordinary Kasparov product, the role of quasi-central approximate units, why naive symmetrisation fails, and how the construction gives control of gamma elements for finite wreath products. I will also indicate the extension to Lafforgue's length-controlled  $KK$ -theory and the resulting application to Baum–Connes permanence. This is joint work with Nansen Petrosyan.

## N. Christopher Phillips (University of Oregon)

**Title:** *An isomorphism theorem for infinite reduced free products*

**Abstract:** An easy to state special case of our main theorem is as follows. Let  $C$  be a separable unital  $C^*$ -algebra, not isomorphic to the complex numbers, equipped with a faithful tracial state. Let  $A$  be a unital direct limit of one dimensional NCCW complexes, also equipped with a faithful tracial state. Suppose there is a unital trace preserving embedding of  $A$  in the Jiang-Su algebra which is an isomorphism on  $K$ -theory. (For example,  $A$  could be  $C([0, 1])$  with Lebesgue measure, or the Jiang-Su algebra itself.) Let  $D$  be the infinite reduced free product of copies of  $C$ . Then the reduced free product of  $A$  with  $D$  is isomorphic to  $D$ .

If  $D$  has real rank zero, then in place of  $A$  we can use  $C(X)$  for any contractible compact metric space  $X$  and any faithful tracial state on  $C(X)$ .

An example consequence is that the reduced free product of infinitely many copies of  $C([0, 1])$  with Lebesgue measure is isomorphic to the reduced free product of infinitely many copies of the Jiang-Su algebra.

The proof depends on an Elliott approximate intertwining argument, in which the triangles in the intertwining approximately commute up to automorphisms but not up to inner automorphisms. This will be explained in the talk.

This is joint work with Ilan Hirshberg.

## Yuhei Suzuki (Hokkaido University)

**Title:** *Stabilization theorem and symmetric structure of Cuntz–Pimsner algebras*

**Abstract:** We establish a crossed product decomposition theorem for stabilized Cuntz–Pimsner algebras. This result extends Cuntz’s classical decomposition for the Cuntz algebras. In this talk, among other applications, I would like to explain how to apply this theorem to provide a short, alternative, and independent solution to the reduced Hao–Ng isomorphism problem. Unlike previous approaches, which heavily rely on non-self-adjoint operator algebras and their  $C^*$ -envelopes, our proof builds solely on basic facts about  $C^*$ -algebras. Joint work with Miho Mukohara (Kyushu), arXiv:2605.21128v2.

## Xiang Tang (Washington University in St. Louis)

**Title:** *Higher Lefschetz formulas on  $\Gamma$ -proper manifolds*

**Abstract:** In the late 80s, Connes and Moscovici proved a higher index theorem for covering spaces and applied it to prove the Novikov conjecture for hyperbolic groups. Let  $\Gamma$  be a discrete group. In this talk, we will explain a generalization of the Connes-Moscovici higher index theorem to manifolds with proper cocompact  $\Gamma$ -actions. As the action is not necessarily free, we will present higher Lefschetz-type formulas on such manifolds for group cocycles delocalized

to a conjugacy class of  $\Gamma$ . This talk is based on joint work with Paolo Piazza, Hessel Posthuma, and Yanli Song.

## **Hang Wang (East China Normal University)**

**Title:** *Euler Characteristic and Higher Kazhdan Projections*

**Abstract:** We compute the equivariant K-homology class of the de Rham operator using Witten deformation, leading to an explicit formula for the Euler characteristic and an equivariant Poincaré–Hopf theorem. We show that the combinatorial Euler characteristic maps under the Baum–Connes assembly to the alternation sum of K-theory class of higher Kazhdan projections, which decompose as alternating sums of averaging projections over finite subgroups. This yields concrete computations and non-vanishing results for delocalized  $\ell^2$ -Betti numbers. This is joint work with Hongzhi Liu, Shaocong Xiang, Zijong Wang and with Sanaz Pooya, Baiying Ren.

## **Jinmin Wang (Institute of Mathematics, Chinese Academy of Sciences)**

**Title:** *Complete metric with positive scalar curvature on punctured aspherical manifolds*

**Abstract:** Gromov and Lawson showed that the torus admits no metric of positive scalar curvature (psc) using index theory. This non-existence of psc metrics is further conjectured to hold for all closed aspherical manifolds, which is a consequence of the rational strong Novikov conjecture. In this talk, I will report our results on psc problems for surgeries of a spin manifold and an aspherical manifold, in particular for aspherical manifolds with a closed subset removed. I will discuss both psc examples and non-existence results, depending on the topology of the removed subset. This talk is based on joint work with Jian Wang and Zhizhang Xie.

## **Stuart White (University of Oxford)**

**Title:** *Infinite reduced free products of nuclear  $C^*$ -algebras*

**Abstract:** Recent work of Hirshberg and Phillips has shown the potential to use classification ideas to obtain isomorphisms between infinite reduced free products. In this talk, I'll describe a special case of a classification of morphisms theorem that can be obtained by using Szabo's KK-uniqueness theorem in the abstract approach to classification, and how this can be used to examine infinite reduced free products. The classification result is joint with Carrion, Gabe, Schafhauser and Tikuisis and the free product part with Curda, Hua, Patchell, Pi and Shiner.

## **Feng Xu (University of California, Riverside)**

**Title:** *On singular limits of relative entropies*

**Abstract:** In this talk we will discuss a general result relating singular limits of certain relative

entropies with index in the setting of conformal nets, which has played an important role recently in the mathematical theory of relative entropies in the context of Conformal Field Theory. Based on my paper Commun. Math. Phys. (2025) 406.

## Yi-Jun Yao (Fudan University)

**Title:** *Quantization of Symplectic Actions and Deformation Theory*

**Abstract:** In Commutative/Noncommutative Geometry, (some) Lie algebras/Hopf algebras play the role of (local) symmetry, and there exist some rich deformation/quantization theories (e.g. Fedosov, Connes-Moscovici). In previous work with Xiang Tang, we established some links between Fedosov and Connes-Moscovici. In this talk, we will present some work in progress about producing similar results in more general settings. For example, Fedosov's quantization of symplectic diffeomorphisms can be generalized to symplectic automorphisms. This is joint work with Haoyuan Gao from ECNU.

## Guoliang Yu (Texas A&M University)

**Title:** *Simplicial Volume and Positive Scalar Curvature*

**Abstract:** I will report on recent joint work with Qiaochu Ma on Gromov's 1986 conjecture that closed manifolds with positive scalar curvature should have vanishing simplicial volume. We prove the conjecture under a mild decay condition on the fundamental group, and as a geometric application show that a closed oriented manifold with scalar curvature sufficiently positive compared with its Ricci lower bound has vanishing simplicial volume (arXiv:2606.29135v2).

## Dmitriy Zanin (Central South University; University of New South Wales)

**Title:** *Principal symbol calculus on contact manifolds:  $C^*$ -algebraic approach*

**Abstract:** Let  $\mathbb{H}^d$  be the Heisenberg group and let  $\{R_k\}_{k=1}^d$  be the Heisenberg-Riesz transforms.  $C^*$ -algebra  $\Pi$  generated by  $\{R_k\}_{k=1}^d$  and by  $\{M_f\}_{f \in C_0(\mathbb{H}^d)}$  allows a principal symbol map:  $*$ -homomorphism  $\text{sym} : \Pi \rightarrow C_0(\mathbb{H}^d) \otimes_{\min} C^*(\{R_k\}_{k=1}^d)$  such that

$$\text{sym}(M_f) = f \otimes 1, \quad \text{sym}(R_k) = 1 \otimes R_k.$$

The algebra  $\Pi$  is invariant under Heisenberg diffeomorphisms and  $\text{sym}$  behaves equivariantly under Heisenberg diffeomorphisms. Contact manifold is locally modelled by the Heisenberg groups (there exists atlas such that transition maps are Heisenberg diffeomorphisms). Using Globalisation Theorem, we extend the notion of principal symbol to (a suitable)  $C^*$ -algebra on contact manifold (via patching process).

Connes trace formula and spectrally correct sub-Riemannian volume are natural corollaries of the above construction.

## Practical Information

### Meals arrangement:

Lunch will be provided for all participants from **Monday (August 3) to Friday (August 7)** on the **4th floor** of SIMIS (buffet style). Kindly note that the Friday lunch will serve as the closing lunch of the event and will be a more elaborate meal to conclude the week.

On **Monday and Tuesday evenings**, dinner will be provided on the **4th floor** of SIMIS.

On **Wednesday evening**, there will be a banquet at 醉辉皇（复旦大学管理学院政立院区店）. Address: 7th–8th Floors, Building C, School of Management Zhengli Campus, Fudan University (New Campus) , 128 Zhengxue Road, Yangpu District, Shanghai (杨浦区政学路 128 号 C 栋 7–8F, 复旦大学管理学院政立院区 (新院区))

For the remaining evenings, no group dinner is planned. We hope you enjoy exploring local dining options at your convenience.

### Group Photo

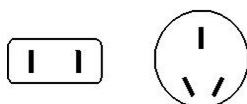
We invite you to take a group photo during tea break on Tuesday afternoon.

### Wireless Internet

The Wi-Fi network at SIMIS is named **simis-guest**, and the password is **88888888**

### Electricity

Standard Chinese socket has two types of pins: 2 round or 3 flat ones:



The voltage is 220 volts, 50 Hz.

### Drinking Water

Tap water is not for direct drinking. However, each floor in SIMIS is equipped with a water dispenser providing safe drinking water in the pantry area.

## Transportation around SIMIS

SIMIS Address: 657 Songhu Road, Yangpu District, Shanghai, China

### Public transportation:

- Bus: 168, 1253, 1226, 937, 187, 537, 758, 966
- Metro Line 10: Exit from **Exit 3 of Sanmen Road Station**, and walk about **400 meters** to reach SIMIS (approximately **7 minutes** on foot).

*The following are the first and last train departure times from the **starting stations** of Line 10 in each direction.*

| Line                                           | First Train | Last Train |
|------------------------------------------------|-------------|------------|
| Line 10 (To Shanghai Hongqiao Railway Station) | 05:25       | 22:30      |
| Line 10 (To Jilong Road)                       | 05:25       | 22:30      |

**For your convenience:** Detailed directions between **the Pagoda Hotel** and **the airport** (in both directions) are available at: <https://www.simis.cn/sub/swoa2026/transportation.html>

1. The taxi fare will be showed on the meters on taxi and recorded on receipts.
2. If you want to visit some other place in Shanghai, you can ask us to write the Chinese addresses or other useful Chinese words for you.

## Useful Chinese Phrases (show them to your taxi driver)

1. Please drop me off at the 657 Songhu Road, Yangpu District, Shanghai, and give me a receipt for the taxi fare. Thank you! (Address: Building A, International Innovation Plaza, No. 657 Songhu Road, Yangpu District)  
请送我到上海数学与交叉学科研究院 (SIMIS), 要发票, 谢谢!  
地址是: 杨浦区淞沪路 657 号创智国际广场 A 座
2. Please drop me off at the Pagoda Hotel Shanghai Wujiaochang, and give me a receipt for the taxi fare. Thank you! (Address: No. 77 Zhengxue Road, Yangpu District)  
请送我到上海五角场 Pagoda 君亭设计酒店, 要发票, 谢谢!  
地址是: 杨浦区政学路 77 号
3. Please drop me off at Shanghai Hongqiao International Airport, and give me a receipt for the taxi fare. Thank you!  
请送我到上海虹桥国际机场, 要发票, 谢谢!

4. Please drop me off at Shanghai Pudong International Airport, and give me a receipt for the taxi fare. Thank you!

请送我到上海浦东国际机场, 要发票, 谢谢!

5. Please drop me off at the Zhongshan Park subway station, and give me a receipt for the taxi fare. Thank you!

请送我到中山公园地铁站, 要发票, 谢谢!

6. Please drop me off at the People's Square (nearby the Nanjing Walking Street), and give me a receipt for the taxi fare. Thank you!

请送我到人民广场 (南京路步行街口), 要发票, 谢谢!

7. Please drop me off at the bund (nearby peace hotel), and give me a receipt for the taxi fare. Thank you!

请送我到外滩 (近和平饭店), 要发票, 谢谢!

8. Please drop me off at the Oriental TV Tower, and give me a receipt for the taxi fare. Thank you!

请送我到东方明珠, 要发票, 谢谢!

9. Please drop me off at the Yuyuan Garden, and give me a receipt for the taxi fare. Thank you!

请送我到豫园, 要发票, 谢谢!

## Banks

The nearest bank to SIMIS is the **Postal Savings Bank of China (Yangpu District Sub-Branch)**, conveniently located just downstairs from the SIMIS building. *Please note that this is a relatively small branch, and some services may be limited.*

- Name: Postal Savings Bank of China (Yangpu District Sub-Branch)  
中国邮政储蓄银行杨浦区支行
- Address: 651 Songhu Road, Yangpu District, Shanghai (杨浦区淞沪路 651 号)
- Business Hours: Monday to Saturday, 08:30–17:00

Another nearby bank is the **Bank of China (Shanghai Knowledge and Innovation Community Sub-Branch)**.

- Name: Bank of China (Shanghai Knowledge and Innovation Community Sub-Branch)  
中国银行上海创智天地科技园支行

- Address: 2nd Floor, Knowledge and Innovation Community, 303 Songhu Road, Yangpu District, Shanghai (杨浦区淞沪路 303 号创智天地广场 2 层)
- Business Hours: Monday to Friday, 09:30–17:00

## Currency Exchange and Money Matters

The currency used in China is the Renminbi (RMB), with the yuan (¥) as its basic unit. Foreign visitors can exchange foreign currency into RMB at banks (such as the Bank of China), airport exchange counters, and other authorized exchange locations with a valid passport or other identification documents. It is recommended to exchange money at banks, as exchange rates at airports may be less favorable.

Banknotes are available in denominations of ¥100, ¥50, ¥20, ¥10, ¥5, and ¥1. Coins include ¥1, ¥0.5 (5 jiao), and ¥0.1 (1 jiao).

Visa and Mastercard are accepted at many hotels, shopping centers, and international businesses. However, mobile payment methods such as Alipay and WeChat Pay are more commonly used in daily life. Visitors may link their international bank cards to these mobile payment platforms for convenient payment.

Exchange rates fluctuate daily. As a reference, 1 USD is approximately equal to 6.8 RMB (July 2026). For the latest exchange rates, please check with banks or official financial service providers.

## Shopping

1. There is a small shopping mall near SIMIS called **Shanghai Guohua Plaza** (上海国华广场), located at 1555 Zhaying Road, Yangpu District, Shanghai (杨浦区闸殷路 1555 号), just **377 meters** from SIMIS. You can find a supermarket called **Freshippo NB** (盒马邻里) inside the mall for daily needs.
2. There is an **ALDI supermarket** (奥乐齐创智天地广场店) located approximately **800 meters** from SIMIS, where you can purchase daily necessities.  
**Address:** Basement Level 1, Knowledge and Innovation Community Plaza, 303 Songhu Road, Yangpu District, Shanghai (上海市杨浦区淞沪路 303 号创智天地广场 B1 层)
3. About **1 kilometer** from SIMIS is **Wujiaochang** (五角场), a major commercial area in Yangpu District. Known for its unique pentagonal layout, Wujiaochang is surrounded by vibrant shopping malls and restaurants, including **Hopson One** (合生汇), **Wanda Plaza** (万达广场), and **Suning Max** (苏宁易购). It is a great place for both shopping and dining.

4. Located **500 meters** from SIMIS, **Daxue Road (大学路)** is a lively street offering a variety of Japanese, Western, and Southeast Asian cuisine. The area is known for its vibrant and youthful atmosphere.

## Tipping

Usually, no tipping is needed (or expected) in China for restaurant and bar waiters, hotel servers, taxi drivers, and doormen.

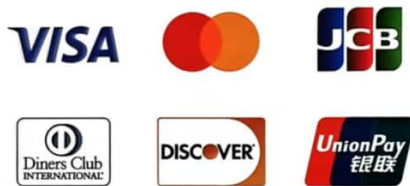
## How to use Alipay

Alipay is one of the major mobile payment platform in China. It's particularly useful for online shopping and international transactions.

**Setup Guide:** Follow these steps to set up Alipay with your international bank card:

Alipay offers payment and travel services tailored for overseas travelers in the Chinese mainland, meeting all your mobile payment and travel needs. Download the Alipay app and link an international credit or debit card from Visa, Mastercard, JCB, Discover®, Diners Club International®, or UnionPay International to start exploring China with Alipay.

支付宝为海外来华游客提供量身定制的支付和旅行服务，旨在满足您在中国的移动支付和出行需求。海外游客可下载支付宝 APP，绑定 Visa、Mastercard、JCB、Discover®、Diners Club International®、UnionPay International 等国际信用卡或借记卡，开启您的中国各地的移动支付之旅。



### Frequently asked questions on 支付宝 Alipay

#### 支付宝常见问题

Overseas bank cards refer to cards of major overseas bank cards, including credit and debit cards, issued outside the Chinese mainland.

境外银行卡指的是在中国境外发行的国际主流卡组织的银行卡，包括信用卡和借记卡。

Q: Where can I pay with overseas bank cards using Alipay?

Q: 目前境外银行卡支持哪些交易场景?

A: Consumers can add overseas bank cards to their Alipay accounts and pay for daily purchases within the Chinese mainland. Overseas bank cards do not support person-to-person transfers, sending or receiving red packets, wealth management services, insurance services, or other financial services.

A: 目前境外银行卡支持在中国内地的衣食住行日常消费，暂不支持个人转账、红包、理财、保险和其他金融服务。

Q: How do I know the exchange rate of the transactions made with overseas bank cards on Alipay?

Q: 境外银行卡支付的汇率怎么计算?

A: The exchange rate for overseas bank cards is provided by the card scheme and issuing bank to which your card belongs. Please refer to the billing statement of your bank card.

A: 境外银行卡的汇率是由您的银行卡所属卡组织和发卡行提供的，具体请以您的银行卡账单为准。

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Scan the QR code or search to download Alipay app  
扫码或在应用市场搜索下载支付宝应用程序

Terms and conditions apply. 受有关条款及细则约束。

### Get started with 支付宝 Alipay in 2 steps

#### 两步用上支付宝



#### 1. Download and register 下载和注册

Download Alipay App, enter your mobile phone number, tap "Next" to register  
下载支付宝 App，输入手机号码，点击"Next"，根据页面提示完成注册



#### 2. Add bank card 绑定银行卡

Tap "Add Now" and follow on-page prompts to complete the process  
点击 "Add Now" 进入绑卡页面，按照页面提示，即可完成绑卡操作

### **Tips**

- Alipay is widely accepted in China, especially for online shopping
- You can use Alipay to pay for public transportation in many cities
- The app is available in multiple languages for international users

ATTENTION: PLEASE BE CAUTIOUS WHEN DOWNLOADING AND INSTALLING APPS ON YOUR MOBILE DEVICE

### **Useful Telephone Numbers**

- Police: 110
- Fire: 119
- Ambulance: 120
- Airport Inquires (Pudong & Hongqiao): 96990

### **Emergency Contact**

- Contact Person: Mr. Michael Fang
- Phone: +86 18916124260
- Email: fangtianyue@simis.cn