

2026 泛函分析及空间理论暑期研讨班

Concentration day on noncommutative analysis

Tuesday, August 4, 2026 Gewu Building (格物楼) 315

9:30-12:00

Norm estimates for some semigroups on noncommutative L^p

Eric Ricard

Université de Caen

We will explain how to derive some properties of the behaviour of positive semigroups on non commutative L^p spaces using some resolvent estimates. The approach relies on an extension of the classical Schur test. This is a joint work with C. Coine and M. Laforge.

Riesz transform on biased hypercube

Zhendong Xu

Seoul National University

We study dimension-free estimates for Riesz transforms associated with the number operators on hypercubes equipped with non-uniform product measures. We establish such dimension-free bounds by terms of a modified square function of Riesz transforms, where some auxiliary function factors arise and compensate for the anisotropy of the weighted structure. We also establish the boundedness of the Riesz transforms on biased hypercubes in Meyer's sense. Under an additional assumption on non-uniform product measures, we further obtain dimension-free estimates for the classical square function.

Our approach is based on Pisier's transference method, and also extends the transference method of Lust-Piquard by embedding the biased hypercubes into some suitable non-tracial baby Fock models, which naturally leads to a purely non-tracial noncommutative framework. Within this setting, we also establish dimension-free estimates for Riesz transforms on q -Araki-Woods algebras.

Small cap square function and decoupling estimates

Liang Wang

City University of Hong Kong

In this talk, we will introduce the small cap square function and decoupling estimates for the parabola, where the small caps are essentially axis-parallel rectangles of dimensions $\delta \times \delta^\beta$ for $0 \leq \beta \leq 1$. Our estimates complement the known results for $1 \leq \beta \leq 2$ and are sharp up to polylogarithmic factors. This is joint work with Jongchon Kim and ChunKeung Yeung.

14:30-17:30

Unitary non-rational conformal field theory

Bin Gui

Tsinghua University

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

Fourier multiplier on the free group vs Schur multipliers on trees

Adrián González Pérez

Autonomous University of Madrid

We will present a technique based on martingale transforms and word length decompositions that allows us to transfer the complete boundedness of Fourier multipliers on the L^p -space of the torus to the S_p -boundedness of radial Schur multiplier on trees. As a consequence, we can construct explicit symbols $m : \mathbb{F}_2 \rightarrow \mathbb{C}$ of Fourier multipliers are unbounded on $L^p(\widehat{\mathbb{F}_2})$, but whose associated Herz-Schur multipliers are bounded on S_p . This result still leaves certain problems on transference open.

We will present joint work with Javier Parcet and Jorge Pérez García. Key insights were provided by Chatgpt-5.6-Sol.

Derivations on von Neumann algebras and L^2 -rigidity

Manish Kumar

KU Leuven

We will review the theory of quantum dynamical semigroups on a von Neumann algebra and their connections to derivations and bimodules. We will discuss their potential applications in Popa's and Peterson's deformation/rigidity theory for possibly non tracial algebras.