

会议简介

为庆祝河北师范大学 120 周年校庆，增进算子理论与算子代数及相关领域学者之间的学术交流与合作，**2022 年 12 月 7 日-11 日**在河北师范大学数学科学学院举办“泛函分析前沿研讨会”线上会议。

组织委员会成员

主席：蒋春澜（河北师范大学）

成员：

房军生（河北师范大学）

李玉成（河北师范大学）

纪奎（河北师范大学）

崔博（河北师范大学）

王洋洋（河北师范大学）

姚兆林（河北师范大学）

秘书：冯杏芳、曹新彦、罗秋文、张核心、徐景、冀姗姗（河北师范大学）

会议日程

日期	时间	报告人	报告题目	主持人
12月7日	12月7日上午 腾讯会议号: 668 2309 5017, 密码: 120120			
	8:30-8:40		开幕式	蒋春澜
	8:40-9:20	刘正伟	量子傅立叶分析--从 Jones 子因子到 Drinfeld 中心	蒋春澜
	9:20-10:00	吴劲松	Complete Positivity of Comultiplication and Unital Categorification	
	10:10-10:50	侯秉喆	Classification, norm and spectrum of the representation of analytic functions	房军生
	10:50-11:30	张远航	Around the closure of the set of commutators of idempotents in $B(H)$	
	12月7日下午 腾讯会议号: 536 3028 4873, 密码: 120120			
	14:00-14:40	王利广	Best constants of Banach-Stone type theorems in subgroups of $C(K)$	李玉成
	14:40-15:20	吴文明	Maps preserving the joint spectrum of projections	
	15:30-16:10	赵显锋	Jeffreys type of overdamped second order linear systems via weighted composition operators	纪奎
	16:10-16:50	许全华	Hankel type operators on quantum tori	
	16:50-17:30	吕小芬	Tent spaces and related operators	

日期	时间	报告人	报告题目	主持人
12月8日	12月8日上午 腾讯会议号：668 2309 5017, 密码：120120			
	8:00-8:40	侯晋川	Characterizing Jordan *-derivations by action on idempotent operators	程立新
	8:40-9:20	吉国兴	非交换解析 Toeplitz 代数：换位与遗传自反性	
	9:30-10:10	洪桂祥	A survey on noncommutative maximal inequalities	崔博
	10:10-10:50	李磊	Rickart Jordan Algebras	
	10:50-11:30	马攀	Szegő limit theorem on weighted Bergman spaces	
	12月8日下午 腾讯会议号：536 3028 4873, 密码：120120			
	14:00-14:40	王茂发	Hilbert-Schmidtness of differences of composition operators	吴恋
	14:40-15:20	于涛	Commutators of truncated Toeplitz operators	
	15:30-16:10	杨义新	Operator theory in Hardy space over the bidisc	王洋洋
	16:10-16:50	晏福刚	The multiplicative Hankel operators	
	16:50-17:30	汪镇	On the takai duality for L_p operator crossed products	

日期	时间	报告人	报告题目	主持人
12月9日	12月9日上午 腾讯会议号：668 2309 5017， 密码：120120			
	8:00-8:40	王勤	Coarsely proper algebras and the twisted coarse Baum-Connes conjecture	焦勇
	8:40-9:20	王凯	Law of Large Numbers in Determinantal Point Processes	
	9:30-10:10	刘浏	Some properties of the operator-valued negative imaginary function	李智强
	10:10-10:50	鲍官龙	Double integral estimates for Besov type spaces and their applications	
	10:50-11:30	何莉	Fredholm composition operators on Hardy-Sobolev spaces with bounded reproducing kernel	
	12月9日下午 腾讯会议号：536 3028 4873， 密码：120120			
	14:00-14:40	侯成军	Continuous orbit equivalence of semi-group actions	李玉成
	14:40-15:20	侯绳照	Fractional calculus on mixed norm spaces	
	15:30-16:10	李颂孝	单位球上 $N(p,q,s)$ 型空间及相关算子	崔博
	16:10-16:50	齐霄霏	Steering Witness and Steering Criterion of Gaussian States	
	16:50-17:30	王子鹏	Carleson measures on the upper plane	

日期	时间	报告人	报告题目	主持人
12月10日	12月10日上午 腾讯会议号: 668 2309 5017, 密码: 120120			
	8:00-8:40	吴志强	Continuous quantum-functions and the Gelfand transform	房军生
	8:40-9:20	周泽华	Essential Spectra of Weighted Composition Operators Induced by Elliptic Automorphisms	
	9:30-10:10	王鹏辉	Essential normality of quotient modules over the polydisc vs. distinguished variety	石瑞
	10:10-10:50	王航	离散群的拓扑 K-理论和 Riemann-Roch 定理	
	10:50-11:30	刘锐	Metric properties on balls and spheres of Banach spaces	
	12月10日下午 腾讯会议号: 536 3028 4873, 密码: 120120			
	14:00-14:40	武俊德	Introduce to Demi-linear Analysis	纪奎
	14:40-15:20	石瑞	TBA	
	15:30-16:10	曹鹏	Where to find the ideal from the range of elementary operators	王洋洋
	16:10-16:50	李智强	TBA	
	16:50-17:30	蔡钢	Banach 空间中几类退化微分方程的适定性	

日期	时间	报告人	报告题目	主持人
12月11日	12月11日上午 腾讯会议号：668 2309 5017, 密码：120120			
	8:00-8:40	郭坤宇	TBA	房军生
	8:40-9:20	曹广福	TBA	
	9:30-10:10	余世霖	From Connes-Kasparov and Mackey analogy to Orbit Method	张远航
	10:10-10:50	江永乐	On invariant von Neumann subalgebras rigidity property	
	10:50-11:30	蒋立宁	Jones type C^* -basic construction in non-equilibrium Hopf span models	
	12月11日下午 腾讯会议号：536 3028 4873, 密码：120120			
	14:00-14:40	胡璋剑	Hankel operators on weighted Fock spaces	房军生
	14:40-15:20	李建奎	TBA	
	15:30-16:10	段永江	Small Hankel operators between weighted Bergman spaces with application to weak factorization	姚兆林
	16:10-16:50	王晓峰	$L^{\vec{p}} - L^{\vec{q}}$ Boundedness of Multiparameter Forelli-Rudin Type Operators on the Product of Unit Balls of \mathbb{C}^n via Schur's Test	
	16:50-17:30	孙龙发	Stability of perturbed norm-additive mappings between Banach spaces	

报告题目与摘要

(按姓氏拼音排序)

报告人：鲍官龙

题目：Double integral estimates for Besov type spaces and their applications

报告摘要：In this talk, for $0 < p < \infty$, we give a complete description of nonnegative radial weight functions ω on the open unit disk \mathbb{D} such that certain double integral estimates for Besov type spaces $B_p(\omega)$ hold. As applications, we give some geometric descriptions of functions in Besov type spaces $B_p(\omega)$ with doubling weights, and characterize the boundedness and compactness of Hankel type operators related to Besov type spaces with radial Békollé-Bonami weights. Some special cases of our results are new even for some standard weighted Besov spaces. The talk is based on a joint work with Dr. Juntao Du and Professor Hasi Wulan.

报告人：蔡钢

题目：Banach 空间中几类退化微分方程的适定性

报告摘要：在向量值函数空间空间里，利用算子傅立叶乘子定理工具，给出了几类退化微分方程具有适性的充要条件。

报告人：曹鹏

题目：Where to find the ideal from the range of elementary operators

报告摘要：In this talk, we will talk about the relationship between the classical ideals and the spectra of elements in range of elementary operators. The classical ideals mean the Jacobson radical, socle, scattered radical and so on. The main elementary operators here are inner derivation, generalized inner derivation, quadratic operator and so on.

报告人：段永江

题目：Small Hankel operators between weighted Bergman spaces with application to weak factorization

报告摘要：The boundedness of the small Hankel operator induced by an analytic symbol f and the Bergman projection P_ν associated to ν , acting from the weighted Bergman space A^p_ω to A^q_ν is characterized on the full range $0 < p, q < \infty$ when ω, ν belong to the class \mathcal{D} of radial weights admitting certain two-sided doubling conditions. Certain result obtained is used to establish the weak factorization of the Bergman spaces. This is joint work with J. Rattya, S. Wang and F. Wu.

报告人：何莉

题目：Fredholm composition operators on Hardy-Sobolev spaces with bounded reproducing kernel

报告摘要：For any real β let H^2_β be the Hardy-Sobolev space on the unit ball B_n , $n \geq 1$. H^2_β is a reproducing kernel Hilbert space and its reproducing kernel is bounded when $\beta > n/2$. In this paper, we characterize when the composition operator C_φ on H^2_β is Fredholm for a non-constant analytic function $\varphi: B_n \rightarrow B_n$.

报告人：洪桂祥

题目：A survey on noncommutative maximal inequalities

报告摘要：In this talk, I shall start with the introduction of noncommutative L^p spaces and the well-known classical maximal inequalities, and then try to give a complete survey over the theory of noncommutative maximal inequalities. This is a newly emerging research field whose modern development has only 20 years' history, and there remains a lot of interesting, natural but challenging problems.

报告人：侯秉喆

题目：Classification, norm and spectrum of the representation of analytic functions

报告摘要：In this talk, we introduce the growth types of weighted Hardy spaces, which are inspired by M. Gromov's work in geometry group theory. We give the Jordan representation theorem for the analytic functions on the unit closed disk as multiplication operators on a weighted Hardy space of polynomial growth. In particular, on a weighted Hardy space of polynomial growth, the multiplication operator M_z is similar to M_{φ} for any analytic automorphism φ on the unit open disk; and for any Blaschke product B of order m , M_B is similar to $\bigoplus_{1}^m M_z$, which is an affirmative answer to a generalized version of a question proposed by R. Douglas in 2007. By the way, we also give a counterexample to show that M_z could be not similar to M_{φ} induced by an analytic automorphism φ on a weighted Hardy space of intermediate growth, which indicates the necessity of the setting of polynomial growth condition. Moreover, we use this method to estimate the norms of composition operators induced by disc automorphisms, and then discuss the spectrum of those composition operators.

报告人：侯成军

题目：Continuous orbit equivalence of semi-group actions

报告摘要：In this talk, we introduce notions of continuous orbit equivalence for countable left Ore semigroup actions on compact spaces by surjective local homeomorphisms or injective actions. We characterize them in terms of the corresponding transformation groupoids and their operator algebras. In particular, we show that two essentially free semigroup actions on totally disconnected compact spaces are continuously orbit equivalent if and only if there is a canonical abelian subalgebras preserving C^* -isomorphism between the associated transformation groupoid C^* -algebras. We also give some examples of orbit equivalence.

报告人：侯晋川

题目：Characterizing Jordan $*$ -derivations by action on idempotent operators

报告摘要：Additive Jordan $*$ -derivations δ acting on a $*$ -ring are those maps that satisfy $\delta(A^2) = \delta(A)A^* + A\delta(A)$ for all A in the ring. Such maps are associated with a kind of Jordan homomorphisms. Let H be a real or complex Hilbert space of dimension ≥ 2 and $\mathcal{B}(H)$ the algebra of all bounded linear operators on H . We discuss additive Jordan $*$ -derivations on $\mathcal{B}(H)$ and give some new characterizations of them by their local behaviors on idempotent operators.

报告人：侯绳照

题目： Fractional calculus on mixed norm spaces

报告摘要： In this talk, I will give an introduction to fractional calculus and discuss the boundness of the fractional integration operator I_t of order $t \in \mathbb{C}$ between two mixed norm spaces. I will treat three types of definitions for I_t : Hadamard, Flett, and Riemann-Liouville. This is based on a joint work with Fang xiang, Guofeng and Zhu xiaolin.

报告人：胡璋剑

题目： Hankel operators on weighted Fock spaces

报告摘要： By using spaces IDA and $\bar{\partial}$ -estimates, we characterize boundedness, compactness of Hankel operators on weighted Fock spaces in \mathbb{C}^n . As an application, for bounded symbols, we show that the Hankel operator H_f is compact if and only if $H_{\bar{f}}$ is compact, which complements the classical compactness result of Berger and Coburn. Similar results hold for Schatten ideals. We also apply our results to the Berezin-Toeplitz quantization.

报告人：吉国兴

题目： 非交换解析 Toeplitz 代数：换位与遗传自反性

报告摘要： 设 M 是 σ -有限 von Neumann 代数, A 是 M 中关于忠实正规条件期望 Φ 的极大次对角代数, $H^p (1 < p < \infty)$ 为基于 A 的非交换 Hardy 空间。设 L_p 和 R_p 分别表示 A 在 H^p 上的左右解析 Toeplitz 代数, 在该报告中我们主要介绍 L_p 和 R_p 的代数换位与遗传自反性, 若 $p=2$ 或 A 有弱分解性质, 则 $L_p = R_p$ 。进一步地, 若 A 是 1 型次对角代数, 则 L_p 和 R_p 是遗传自反代数。

报告人：江永乐

题目： On invariant von Neumann subalgebras rigidity property

报告摘要： For a countable discrete group G , we say it satisfies the invariant von Neumann subalgebras rigidity (ISR) property if every G -conjugate invariant von Neumann subalgebra M in $L(G)$ is of the form $M=L(H)$ for some normal subgroup H of G . In this talk, we discuss the problem of determining which group G has this ISR property. Joint work with Dr. Tattwamasi Amrutam.

报告人：蒋立宁

题目： Jones type C^* -basic construction in non-equilibrium Hopf span models

报告摘要： Let \mathcal{H} be a finite dimensional Hopf C^* -algebra, \mathcal{K} be a Hopf C^* -subalgebra of \mathcal{H} . Considering that the quantum field algebra $\mathcal{F}_{\mathcal{K}}$ of non-equilibrium Hopf spin models carries a $D(H,K)$ -invariant subalgebra $\mathcal{A}_{\mathcal{K}}$, we show that the C^* -basic construction for the inclusion $\mathcal{A}_{\mathcal{K}} \subseteq \mathcal{F}_{\mathcal{K}}$ can be expressed as the crossed product C^* -algebra $\mathcal{F}_{\mathcal{K}} \rtimes D(H,K)$. Here, $D(H,K)$ is a bicrossed product of the opposite dual $\widehat{H^{\text{op}}}$ and \mathcal{K} , and we call it a relative double algebra. Furthermore, the natural action of $\widehat{D(H,K)}$ on $D(H,K)$ gives rise to the iterated crossed product $\mathcal{F}_{\mathcal{K}} \rtimes D(H,K) \rtimes \widehat{D(H,K)}$, which coincides with the C^* -basic construction for the inclusion $\mathcal{F}_{\mathcal{K}} \subseteq \mathcal{F}_{\mathcal{K}} \rtimes D(H,K)$. Using the quasi basis, the C^* -algebra index of $\mathcal{A}_{\mathcal{K}}$ in $\mathcal{F}_{\mathcal{K}}$ is given. Furthermore the symmetry structure and Jones type tower of field algebra $\mathcal{F}_{\mathcal{K}}$ are obtained, and the new field algebra emerges exactly as the

iterated crossed product.

报告人：李磊

题目： Rickart Jordan Algebras

报告摘要： The main goal of this talk is to introduce and explore an appropriate notion of weakly Rickart JB^* -triples. We introduce weakly and weakly order Rickart JB^* -triples, and we show that a C^* -algebra is a weakly (order) Rickart JB^* -triple precisely when it is a weakly Rickart C^* -algebra.

报告人：李颂孝

题目： 单位球上 $N(p,q,s)$ 型空间及相关算子

报告摘要： 在本报告中，将简要介绍单位球上 $N(p,q,s)$ 型空间的一些函数性质及其上的一些算子理论性质。

报告人：刘浏

题目： Some properties of the operator-valued negative imaginary function

报告摘要： In this talk, we introduce a generalized definition of irrational operator-valued negative imaginary functions, which is described in terms of the complex symmetric operator. In particular, the matrix-valued symmetric negative imaginary transfer function can be seen as an operator-valued complex symmetric negative transfer function defined on a finite-dimensional Hilbert space. Applying the frequency-domain properties, we present the negative imaginarity by the sign conditions of imaginary axis and infinity point. In addition, we list some spectral properties of negative imaginary functions, which include point spectrum, continuous spectrum, residual spectrum and approximate spectrum.

报告人：刘锐

题目： Metric properties on balls and spheres of Banach spaces

报告摘要： A Banach space is said to have the ball-covering property (BCP) if its unit sphere can be covered by countably balls off the origin (Cheng 2006). We give its topological characterization (countable π -basis), and its stability on vector-valued spaces. We also explore new examples on tensor products and non-commutative spaces of operators. In particular, all $B(X)$ on classical sequence spaces have the BCP, while $B(L1)$ fails. Using these, we show that BCP is not hereditary for 1-complemented subspaces.

For extension problems from unit spheres to balls even the whole space, such as Mazur-Ulam property (Cheng and Dong 2011), we introduce the Figiel property on isometric embeddings between unit spheres. A quantitative quasi-anti-Lipschitz norm inequality is obtained for a near-isometric embedding on unit sphere of a Lindenstrauss space. We show that every bijective near-isometry between their unit spheres can be extended to balls, which implies the Mazur-Ulam property.

报告人：刘正伟

题目： 量子傅立叶分析--从 Jones 子因子到 Drinfeld 中心

报告摘要： 我们将介绍量子傅立叶分析的研究背景、近期主要成果以及未来的发展方向。在早期工作中我们重点研究了 Jones 子因子理论上的傅立叶分析，进而提出量子傅立叶分析方向研究更一般的量子对称性。近期我们发现结合 Drinfeld 中心理论，我们的量子不等式可以转化为全新的酉范畴化判定条件，判定效率高得惊人。通过这个方法我们不仅解决了公开问题，同时也发现了拓扑量子场论中新的分析结构。拓扑量子场论与调和分析的有机结合是一个有待深入研究的全新领域。

报告人：吕小芬

题目： Tent spaces and related operators

报告摘要： In this talk, we give the characterizations on the embedding theorems from Hardy spaces to tent spaces. As some applications, we also obtain the area integral operators on weighted Bergman spaces.

报告人：马攀

题目： Szegő limit theorem on weighted Bergman spaces

报告摘要： The problem to determine the phase transition of Ising model in dimension two can be reduced to an asymptotic question of Toeplitz determinants. The beautiful Szegő limit theorems describe the asymptotic behaviour of the determinants of large Toeplitz matrices, which was proved by Gábor Szegő. In this talk, we will present some progress of Szegő limit theorem on weighted Bergman spaces.

报告人：齐霄霏

题目： Steering Witness and Steering Criterion of Gaussian States

报告摘要： Quantum steering is an important quantum resource, which is intermediate between entanglement and Bell nonlocality. In this paper, we study steering witnesses for Gaussian states in continuous-variable systems. We give a definition of steering witnesses by covariance matrices of Gaussian states, and then obtain a steering criterion by steering witnesses to detect steerability of any $(m+n)$ -mode Gaussian states. In addition, the conditions for two steering witnesses to be comparable and the optimality of steering witnesses are also discussed.

报告人：孙龙发

题目： Stability of perturbed norm-additive mappings between Banach spaces

报告摘要： In this talk, we study the stability of ε -norm-additive mappings between Banach spaces. We prove that every surjective ε -norm-additive mapping between two Banach spaces can be approximated by a linear surjective isometry with the error no more than $\frac{3}{2}\varepsilon$. The estimate is optimal. This is a joint work with Gang Cai and Bentuo Zheng.

报告人：汪镇

题目： On the takai duality for L_p operator crossed products

报告摘要： In this talk, we will give some progress (joint work with Sen Zhu) on a problem raise by N. C. Phillips concerning the existence of Takai duality for L^p operator crossed products $F^p(G, A, \alpha)$. Inspired by D. Williams' proof for the Takai duality theorem for C^* -algebras, we construct a homomorphism Φ from $F^p(\hat{G}, F^p(G, A, \alpha), \hat{\alpha})$ to $\mathcal{K}(l^p(G)) \otimes_p A$. Under some assumptions of G and A , we show that Φ is an isomorphism if and only if either G is finite or $p=2$; in particular, Φ is an isometric isomorphism in the case that $p=2$. Moreover, Φ is equivariant for the double dual action $\hat{\hat{\alpha}}$ of G on $F^p(\hat{G}, F^p(G, A, \alpha), \hat{\alpha})$ and the action $\mathrm{Ad} \otimes \alpha$ of G on $\mathcal{K}(l^p(G)) \otimes_p A$. This suggests a negative answer to N. C. Phillips'

problem on the L^p Takai duality in the case that $p \in [1, \infty) \setminus \{2\}$ and G is infinite.

报告人：王航

题目：离散群的拓扑 K-理论和 Riemann-Roch 定理

报告摘要：离散群的 K-理论是 Baum-Connes 猜测中通过高指标映射来近似约化群 C^* -代数 K-理论的拓扑不变量，与经典指标理论紧密相关。例如，它的构造所运用的 K-理论的推出映射自然的蕴含了椭圆算子的解析指标。通过研究离散群 K-理论的陈特征及其与循环上圈的配对我们得到 Baum-Connes 猜测左侧的高指标公式，其中，陈特征构造过程蕴涵了一个等变 Grothendieck-Riemann-Roch 公式。这是我与 Paulo Carrillo-Rouse 和 Bai-Ling Wang 的合作。

报告人：王凯

题目：Law of Large Numbers in Determinantal Point Processes

报告摘要：In the talk we will show a weak law of large numbers for the determinantal point processes from zeros of Gaussian analytic functions on the unit disc. This is a joint work with professor Yanqi Qiu.

报告人：王利广

题目：Best constants of Banach-Stone type theorems in subgroups of $C(K)$

报告摘要：Assume that X, Y are compact Hausdorff spaces. Let $C(X)_+, C(Y)_+$ be the sets of all strictly positive real functions on X, Y respectively. Let T be a surjective map from a point separating multiplicative subgroup $G \subset C(X)_+$ onto a point separating multiplicative subgroup $H \subset C(Y)_+$ satisfying $T1=1$ and $\|\frac{1}{M}\|f \cdot g^{-1}\| \leq \|Tf \cdot (Tg)^{-1}\| \leq M \|f \cdot g^{-1}\|$ for all $f, g \in G$ and for some constant $M \geq 1$. Then there exists a homeomorphism τ from the ∂H of H onto the ∂G of G such that $\|\frac{f(\tau(y))}{M^2}\| \leq \|Tf(y)\| \leq M^2 \|f(\tau(y))\|$ for all $f \in G$ and all $y \in \partial H$. The constant M^2 in inequality above is optimal. A similar argument yields a generalization of the classical Banach-Stone Theorem to isometries defined from an additive subgroup of $C_0(X)$ into $C_0(Y)$ for locally compact Hausdorff spaces X and Y .

报告人：王茂发

题目：Hilbert-Schmidtness of differences of composition operators

报告摘要：In the setting of the standard weighted Bergman spaces over the unit disk, compactness characterizations for linear combinations of composition operators have been known. One of those characterizations asserts that degenerate double differences, compared with each single difference, do not improve the compactness at all in the sense that a degenerate double difference is compact only when each difference is individually compact. Such a rigid phenomenon is actually known to hold for a certain broader class of linear combinations. In this talk we investigate into similar properties for Hilbert-Schmidtness with main focus on double differences.

We first obtain a complete characterization for Hilbert-Schmidt double differences of composition operators. We then observe that double differences, compared with each single difference, can improve the Hilbert-Schmidtness even in the degenerate case, by constructing concrete examples of Hilbert-Schmidt double differences with each difference not being Hilbert-Schmidt. We also include

some remarks concerning connections between Hilbert-Schmidtness on the standard weighted Bergman spaces and weak-to-strong boundedness on certain vector-valued weighted Bergman spaces.

报告人：王鹏辉

题目： Essential normality of quotient modules over the polydisc vs. distinguished variety

报告摘要： In this talk, I will introduce the relationship between the essential normality of quotient modules over the polydisc with distinguished variety. Some recent development on this topic will be considered. The talk is based on the series of joint work with K. Guo and C. Zhao.

报告人：王勤

题目： Coarsely proper algebras and the twisted coarse Baum-Connes conjecture

报告摘要： We introduce a notion of coarsely proper C^* -algebra for coarse embeddings of metric spaces to formulate and prove a twisted version of the coarse Baum-Connes conjecture with coefficients in the coarsely proper algebras. This may be regarded as a coarse geometric version of the Green-Julg theorem in the way to prove the Baum-Connes conjecture for countable discrete groups. It provides a general conceptual framework for the proof of the coarse Novikov conjecture for coarse embeddings of metric spaces into several type of spaces, including Hilbert spaces, non-positively curved manifolds, Banach spaces with property (H), Hilbert-Hadamard spaces, etc.. This is joint work with Liang Guo, Zheng Luo and Yazhou Zhang.

报告人：王晓峰

题目： $L^{\vec{p}} - L^{\vec{q}}$ Boundedness of Multiparameter Forelli-Rudin Type Operators on the Product of Unit Balls of \mathbb{C}^n via Schur's Test

报告摘要： In this paper, two classes of multiparameter Forelli-Rudin type operators defined on the product of unit balls in \mathbb{C}^n are introduced, which are natural extensions of the wellknown Forelli-Rudin type operators originated by Forelli and Rudin in 1974, and further studied by Kures-Zhu in 2006, Zhao in 2015, and Zhao-Zhou in 2022. By establishing some new Schur's tests, in this paper, we completely characterize the boundedness of these two classes operators from one mixed-norm Lebesgue space $L^{\vec{p}}$ to another space $L^{\vec{q}}$, when $1 \leq \vec{p} \leq \vec{q} < \infty$, equipped with possibly different weights. With these characterizations, we are able to obtain the necessary and sufficient conditions for both $L^{\vec{p}} - L^{\vec{q}}$ boundedness of the weighted multiparameter Berezin transform and $L^{\vec{p}} - L^{\vec{q}}$ boundedness of the weighted multiparameter Bergman projection, where $A^{\vec{q}}$ denotes the mixed-norm Bergman space.

报告人：王子鹏

题目： Carleson measures on the upper plane

报告摘要： 经典意义下，单位圆盘和上半平面的 Bergman 空间的函数与单位圆周和实直线上的函数都没有自然的对应关系。借助圆周上分式 Laplace 算子的 Bourgain-Brezis 不等式，Da Lio-Riviere-Wettstein 得到了圆盘上 Bergman 空间与圆周上 Sobolev-型空间之间的对应。通过建立 Fourier 乘子的加权 Bourgain-Brezis 不等式，我们证明了径向(水平)加权 Bergman 空间的 Da Lio-Riviere-Wettstein-型对应成立当且仅当径向权是 Bergman 空间上的 Carleson 测度。本报告将着重介绍我们在上半平面得到的结论，这是与韩勇(深圳大学)和邱彦奇(武汉大学)的合作。

报告人：吴劲松

题目： Complete Positivity of Comultiplication and Unital Categorification

报告摘要： In this talk, we introduce the primary criteria based on the study of complete positivity of comultiplication on fusion rings. It turns out that the criteria are stronger than the Schur product criteria. By localization and reduction, we find many criteria to rule out (multi)fusion ring with high rank, high multiplicity and sparse set. Our criteria are efficient and powerful for unital categorification by checking a big dataset of fusion rings. This is a joint work with Linzhe Huang, Zhengwei Liu, Sebastien Palcoux.

报告人：吴文明

题目： Maps preserving the joint spectrum of projections

报告摘要： The well-known Gleason-Kahane-Zelazko theorem states that a nonzero linear functional on a unital complex Banach algebra is an algebra homomorphism if and only if it maps every element inside its spectrum. Kaplansky asked whether a unital linear map between unital complex Banach algebras which shrinks spectrum is a Jordan homomorphism. Aupetit confirmed this conjecture for von Neumann algebras. This conjecture still is open even for C^* -algebras.

In this talk, we will discuss the surjective maps which shrink or preserve the joint spectrum of projections. It is shown that the maps shrink the joint spectrum of any two projections if and only if it is joint spectrum preserving for any two projections and it is induced by a ring automorphism on complex domain in a particular way. It is also shown that the map shrinks the joint spectrum of any k (>2) projections if and only if it is induced by a unitary or an anti-unitary.

报告人：吴志强

题目： Continuous quantum-functions and the Gelfand transform

报告摘要： Let A be a unital C^* -algebra with no 2 -dimensional irreducible A -representation, and Ω_A be its Gelfand spectrum; namely, the set of all pure states of A , equipped with the canonical "quantum-topological space structure" induced by a hull-kernel type construction. Generalizing the notion of bounded continuous functions on topological spaces, we define sign-preserving bounded continuous quantum-functions on quantum-topological spaces. We show that A coincides precisely with the algebra of sign-preserving bounded continuous quantum-functions on Ω_A . This extends the usual Gelfand transform for commutative unital C^* -algebras to the non-commutative case.

报告人：武俊德

题目： Introduce to Demi-linear Analysis

报告摘要： 自从上世纪初 Banach 等人建立泛函分析理论以来, 该理论在众多领域产生了重大影响. 泛函分析是研究数学物理问题, 特别是量子理论问题必不可少的重要工具. 泛函分析建立在几个基本定理基础上. 这些定理包括开映射定理、闭图像定理、凸集分离定理、等度连续定理、一致有界原理、对偶理论等. 上世纪 50 年代, 法国著名数学家 Schwartz 以对偶理论为工具, 建立了影响深远的广义函数理论, 又称为分布理论. 广义函数是研究现代偏微分方程理论和调和理论的重要工具之一.

本世纪初开始, 李容录和钟书慧等人通过弱化空间结构和线性映射的要求, 将开映射定理、闭图像定理、等度连续定理、一致有界原理、对偶理论、广义函数理论等实质性地提升到了非线性情形. 基于这些改进的基本定理, 我们可建立相应的分析理论, 简称为泛线性分析.

在这个报告里，我将介绍这方面的基本想法和研究进展.

报告人：许全华

题目： Hankel type operators on quantum tori

报告摘要： We characterize the Schatten class membership of commutators of singular integral operators on quantum tori in terms of Besov spaces.

报告人：晏福刚

题目： The multiplicative Hankel operators

报告摘要： Recently, the operator theory on the Hardy space of the infinite-dimensional polydisc received considerable attention due to the connection to the Dirichlet series. In particular, the multiplicative Hankel operators, initiated by Henry Helson in 2006, are the small Hankel operators on the Hardy space of the infinite-dimensional polydisc. In this talk, we will introduce the multiplicative Hankel operators and present some recent progress. This talk is based on a joint work with Xiangdi Fu and Prof. Kunyu Guo.

报告人：杨义新

题目： Operator theory in Hardy space over the bidisc

报告摘要： As an important component of multivariable operator theory, the theory in $H^2(\mathbb{D}^2)$ focuses primarily on two pairs of commuting operators that are naturally associated with submodules and quotient modules in $H^2(\mathbb{D}^2)$. This talk aims to give an introduction and some recent results to the operator theory in the Hardy space over the bidisc. We will focus on some important techniques as well as unsolved problems. This is based on the joint work with Yufeng Lu and Chao Zu.

报告人：于涛

题目： Commutators of truncated Toeplitz operators

报告摘要： A model space is a subspace of the Hardy space which is invariant under the backward shift, and a truncated Toeplitz operator is the compression of a Toeplitz operator on some model space. In this talk, we discuss necessary and sufficient conditions for the commutator or semicommutator of two truncated Toeplitz operators to be compact.

报告人：余世霖

题目： From Connes-Kasparov and Mackey analogy to Orbit Method

报告摘要： Originally arising from the world of operator algebras and noncommutative geometry, the Connes-Kasparov isomorphism predicts interesting phenomena, known as the Mackey analogy, in representation theory of reductive Lie groups. I will explain how to apply similar ideas to the study of coadjoint orbit method, which says that one can construct representations from coadjoint orbits by quantization.

报告人：张远航

题目： Around the closure of the set of commutators of idempotents in $B(H)$

报告摘要： In this talk, we study the norm-closure of the set $\mathfrak{C}_\mathfrak{E}$ of bounded linear operators acting on a complex, separable Hilbert space \mathcal{H} which may be

expressed as the commutator of two idempotent operators.

In particular, we will identify which biquasitriangular operators belong to the norm-closure $\overline{\mathfrak{C}_\mathfrak{E}}$ of $\mathfrak{C}_\mathfrak{E}$, and we exhibit an index obstruction to membership in $\overline{\mathfrak{C}_\mathfrak{E}}$. If time permitted, we will also give some results about the factorisations of bounded linear operators on \mathcal{H} as sums and products of elements in $\mathfrak{C}_\mathfrak{E}$ and related sets. This is a joint work with Laurent Marcoux and Heydar Radjavi.

报告人：赵显锋

题目：Jeffreys type of overdamped second order linear systems via weighted composition operators

报告摘要：We consider Jeffreys type of overdamped second order linear systems with observed outputs in the setting of Hilbert spaces. We characterize the infinite-time admissibility of such system by the boundedness of weighted composition operators on the Hardy space over the open right half plane.

报告人：周泽华

题目：Essential Spectra of Weighted Composition Operators Induced by Elliptic Automorphisms

报告摘要：The spectrum of a weighted composition operator $C_{\psi, \varphi}$ who is induced by an automorphism has been investigated for over fifty years. However, many results are got only under the condition that the weight function ψ is continuous up to the boundary. In this paper we study the spectra and essential spectra of $C_{\psi, \varphi}$ on weighted Bergman spaces when φ is an elliptic automorphism, without the assumption that ψ is continuous up to the boundary.

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