
Horizons in Operator Algebras
Horizons dans les algèbres d'opérateurs

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JANANAN ARULSEELAN, Iowa State University

BRANIMIR CACIC, University of New Brunswick, Fredericton
Revisiting the differential topology of higher-dimensional noncommutative tori

The earliest results in noncommutative (NC) differential geometry à la Connes concern the differential topology of higher-dimensional NC tori. In this talk, I'll sketch how these results interface with recent progress in NC differential and Riemannian geometry. In particular, I'll sketch how Elliott's calculation of the diffeomorphism group of a Diophantine-irrational NC 2-torus generalizes to higher dimensions and how Rieffel-Schwarz and Li's classification of higher-dimensional NC tori up to complete Morita equivalence can be refined to classify NC Hermitian line bundles with unitary connection on totally irrational higher-dimensional NC tori up to gauge equivalence. This is partly based on joint work with T. Venkata Karthik.

KEN DAVIDSON, U.Waterloo and U.Ottawa
Large Perturbations of Nest Algebras

Let $\mathcal{M}$ and $\mathcal{N}$ be nests on separable Hilbert space. If the two nest algebras are distance less than 1 ($d(\mathcal{T}(\mathcal{M}), \mathcal{T}(\mathcal{N})) < 1$), then the nests are distance less than 1 ($d(\mathcal{M}, \mathcal{N}) < 1$). If the nests are distance less than 1 apart, then the nest algebras are similar, i.e. there is an invertible S such that $S\mathcal{M} = \mathcal{N}$, so that $S\mathcal{T}(\mathcal{M})S^{-1} = \mathcal{T}(\mathcal{N})$. However there are examples of nests closer than 1 for which the nest algebras are distance 1 apart.

ANDREW DEAN, Lakehead University
Classification problems concerning real structures and gradings

We shall give a survey and update on progress for problems concerning classification of real structures and gradings on C^* -algebras, and their associated range of invariant problems.

REMUS FLORICEL, University of Regina

SAEED GHASEMI, Lakehead University

BRADD HART, McMaster University

CRISTIAN IVANESCU, MacEwan University
Preservation of the Way-Below Relation Under Tensor Products

We show that the way-below relation is preserved under tensor products. While completing this work, we became aware that, in the context of the Cuntz semigroup, an instance of this result was previously established by Antoine, Perera, and Thiel. We nevertheless present our proof here, as it provides a complementary approach and may offer additional insight into the behaviour of the way-below relation under tensorial constructions.

DAVID KRIBS, University of Guelph

HUAXIN LIN, Shanghai Institute for Mathematics and Interdisciplinary Sciences

Almost commuting selfadjoint operators and quantum mechanics

We show that Mumford's Approximately Macroscopically Unique (AMU) states exist for quantum systems consisting of unbounded self-adjoint operators when the commutators are small. In particular, AMU states always exist in position and momentum systems when the Planck constant $|\hbar|$ is sufficiently small. However, we show that these standard quantum mechanical systems are far away from classical mechanical (commutative) systems even when $|\hbar| \rightarrow 0$.

AAREYAN MANZOOR, University of Waterloo

PARTICK MELANSON, University of Regina

MEHDI MORADI, University of Ottawa

ZHUANG NIU, University of Wyoming

DOLAPO OYETUNBI, University of Windsor

EBRAHIM SAMEI, University of Saskatchewan

CHRISTOPHER SCHAFHAUSER, University of Nebraska - Lincoln

THOMAS SINCLAIR, Purdue University

CHARLES STARLING, Carleton University

DAN URSU, York University

DILIAN YANG, University of Windsor