



Sefydliad Gwyddorau Mathemategol a Chyfrifiannol
Cymru
Wales Institute of Mathematical and Computational
Sciences

WIMCS Operator Algebras Workshop 12-13 April 2013

The lectures will be in the Robert Recorde Lecture Theatre, Department of Computer Science, Faraday Building on 12th April and in Lecture Room 2, Fulton House on 13th April – at Swansea University.

Edwin Beggs (Swansea)

Noncommutative complex differential geometry.

Abstract: This talk is about the basic properties of noncommutative analogues of almost complex structures, integrable almost complex structures, holomorphic curvature, cohomology, and holomorphic sheaves. The starting point is a differential structure on a noncommutative algebra defined in terms of a differential graded algebra. This is placed in the context of starting work on a noncommutative version of Serre's GAGA - Geometrie algebrique et geometrie analytique - the correspondence between certain complex manifolds and certain algebraic varieties. Joint work with S. Paul Smith.

Tomasz Brzezinski (Swansea)

Curved differential graded algebras and corings.

Abstract: A relationship between curved differential algebras and corings is established and explored. In particular it is shown that the category of semi-free curved differential graded algebras is equivalent to the category of corings with surjective counits. Under this equivalence, comodules over a coring correspond to integrable connections or quasi-cohesive curved modules.

Gwion Evans (Aberystwyth)

Higher-rank graphs and their operator algebras.

Abstract: Since their introduction by Kumjian and Pask in 2000 as graphical models for the higher rank Cuntz-Krieger algebras of Robertson and Steger, there has been much interest in developing a general theory of the underlying higher-rank graphs along with their associated operator algebras. We will present a brief survey of the latest developments in these two areas.

Rolf Gohm (Aberystwyth)

Distributional and Dynamical Symmetries

Abstract: We consider certain Janus-faced symmetries which apply on the one hand to distributions of (non-commutative) random variables and on the other hand to related dynamical systems. Via de Finetti-type theorems they give rise to variants of stochastic independence. We discuss exchangeability, braidability and spreadability in this respect and in particular point to some gaps in our understanding. This is joint work with Claus Koestler.

Robin Hillier (Cardiff)

Conformal nets of quantum fields and K-theory

Abstract: This talk presents a simple but illuminating application of K-theory. Starting with the framework of (rational) conformal nets of von Neumann algebras in algebraic quantum field theory, we recall a few general properties. The main objective is then to discuss some aspects of their representation theory, the construction of certain universal C*-algebras and the computation of their K-groups. We conclude by describing how the representations give rise to faithful actions in K-theory, which correspond to Kasparov products.

Vaughan Jones (Vanderbilt)

I Several algebras defined by a planar algebra.

II On the classification of small index subfactors (Morrison, Peters, Snyder et al)

Mathew Pugh (Cardiff)

Spectral measures invariant under finite subgroups of $GL(2, \mathbb{Z})$.

Abstract: Spectral measures for nimrep graphs arising in (braided) subfactor theory provide invariants for the original braided subfactor. Spectral measures for nimrep graphs associated with simple rank 2 Lie groups have been studied, as well as measures for the fusion graphs for irreducible characters of these Lie groups. These measures are all invariant under an action of the corresponding Weyl group, which is a subgroup of $GL(2, \mathbb{Z})$. We discuss these spectral measures and generalise this setup to other subgroups H of $GL(2, \mathbb{Z})$ by constructing fusion graphs for H -invariant formal characters.

Claire Shelly (Cardiff)

Type III Subfactors and Planar Algebras

Abstract: In this talk I will show how the system of endomorphisms and intertwiners of a type III subfactor may be used to define a planar algebra. I will also describe how planar algebras may be used to construct type III subfactors using a modification of a construction due to Guionnet-Jones-Shlyakhtenko.

Otogo Uuye (Cardiff)

K-continuity is equivalent to K-exactness.

Abstract: It is well-known that a C*-algebra is tensor-continuous if and only if it is tensor-exact. In this talk, we consider a K-theoretic analogue of this result and show that K-continuity is equivalent to K-exactness.

Timetable

Friday	Lectures in Recorde	Saturday	Lectures in Fulton
		10.30	G. Evans
		11.00	Brzezinski
		11.30	Hillier
		12.00	Shelly
		1.00	Lunch Pub on Pond
1.00	Gohm		
1.30	Uuye		
2.00 - 2.30	Tea	2.30	Pugh
2.30	Jones I	3.00	Beggs
		4.00	Jones II