C*-algebras
C*-algèbres
(Org: **Cristian Ivanescu** (Alberta) and/et **Dan Kucerovsky** (UNB))

MAN-DUEN CHOI, University of Toronto
How I could think of tensor products of matrices

In all years, I have mathematical dreams on completely positive linear maps, concerning tensor products of complex matrices. Suddenly, I wandered into the quantized world of fantasies and controversies. To release myself from Quantum Entanglements and the Principle of Locality, I need to seek the meaning of physics and the value of metaphysics. Conclusion: I THINK, THEREFORE I AM a pure mathematician.

MAGDALENA GEORGESCU, University of Toronto
Spectral Flow and C-algebras*

In B(H) (the set of bounded operators on a Hilbert space), the spectral flow counts the net number of eigenvalues which change sign as one travels along a path of self-adjoint Fredholm operators; in other words, spectral flow measures a change in the spectrum of the operators. The beginning of the talk will make precise the definition of spectral flow in this context, its properties and its connections to K-theory and non-commutative geometry. I will conclude the talk with a discussion of spectral flow in the context of a unital C*-algebra with a norm-closed 2-sided ideal.

MICHEL HILSUM, Paris 7 / Jussieu

CRISTIAN IVANESCU, University of Alberta and MacEwan University
The Cuntz semigroup of tensor product of C-algebras*

In my joint work with Dan Kucerovsky, we study how the Cuntz semigroup of the tensor product, $A \otimes B$, relates to the Cuntz semigroup of A and the Cuntz semigroup of B. The case A = B turns out to be already very interesting. A survey of our results will be presented.

DAN KUCEROVSKY, University of New Brunswick at Fredericton
K-theory of C-bialgebras*

We report on extending the Elliott classification program to certain classes of C*-bialgebras.

GORDON MACDONALD, University of Prince Edward Island
Faster Matrix Multiplication

In 1969, Volker Strassen came up with an algorithm for multiplying two 2×2 matrices using only 7 multiplications (instead of the usual 8). Using block matrices, this allows us to multiply two $n \times n$ matrices in $n^{2.81}$ multiplications. Subsequent improvements by Coppersmith and Winograd, Cohn and Umans, Stothers, and others have reduced this to $O(n^{2.38})$ multiplications, but these techniques only provide advantage for extremely large matrices.

We present some common operator-theoretic frameworks for all these results, and discuss some new results for small matrices.

PING WONG NG, Lousiana

SUTANU ROY, Department of Mathematics and Statistics, University of Ottawa
Slices of braided multiplicative unitaries.

Braided multiplicative unitaries naturally arise in the theory of semidirect product of quantum groups. Roughly, it is a unitary operator acting on two fold tensor product of Hilbert spaces with certain properties. In this talk, we show that, under certain conditions, slices of braided multiplicative unitaries generate C^*-algebras. This is one of the key result to study braided (C^*-algebraic) quantum groups using braided multiplicative unitaries as a fundamental object, following the axiomatisation of (C^*-algebraic) quantum groups by Baaj and Skandalis, and Woronowicz. This is a joint work with S.L. Woronowicz.

AYDIN SARRAF, University of New Brunswick
On the classification of inductive limits of certain real circle algebras

In this talk, I give a classification theorem for simple unital real C^*-algebras that are inductive limits of certain real circle algebras. This is an attempt to provide a classification theorem similar to the well-known classification theorem of simple unital complex AT-algebras but for real C^*-algebras.

ANA SAVU, University of Alberta
Spectral gap of a class of unbounded, positive-definite operators

The spectra of Toeplitz operators is well understood. We use the properties of the spectra of Toeplitz operators to understand the spectra of a class of unbounded, positive-definite operators.

ANDREW TOMS, Purdue

DILIAN YANG, University of Windsor
Maximal abelian subalgebras in higher rank graph C-algebras*

Higher rank graphs are a natural generalization of directed graphs. The graph C*-algebra of a higher rank graph is the universal C*-algebra generated by the partial isometries associated to paths and projections associated to vertices, which satisfy the Cuntz-Krieger relations. It turns out that the C*-subalgebra, called the diagonal subaglebra, generated by those projections is abelian, and that it is a maximal abelian subalgebra if and only if the ambient graph is aperiodic. In this talk, we will report some recent results on a natural candidate corresponding to the diagonal subalgebra for a periodic higher rank graph.