KENNETH R DAVIDSON
University of Waterloo

A Constrained Nevanlinna-Pick Interpolation Problem

(joint work with Vern Paulsen, Mrinal Raghupathi and Dinesh Singh) We consider Nevanlinna-Pick interpolation on the unit disk with the additional constraint that the bounded analytic functions satisfy $f'(0) = 0$. We obtain necessary and sufficient conditions for scalar interpolation by a function of norm 1 in terms of a family of Pick conditions associated to a natural family of reproducing kernel Hilbert spaces. An analysis of C*-envelopes is used to show that these same conditions do not suffice for matrix interpolation.

XUAN DUONG
Macquarie University

Boundedness of Riesz Transforms of Magnetic Schrödinger Operators

Let $A = -(\nabla - i\vec{a})^2 + V$ be a magnetic Schrödinger operator acting on $L^2(\mathbb{R}^n)$, $n \geq 1$, where $\vec{a} = (a_1, \cdots, a_n) \in L^2_{\rm loc}$ and $0 \leq V \in L^1_{\rm loc}$. By means of area integral function, a Hardy space H^1_A associated with A can be defined. We then show that Riesz transforms $T_k = (\frac{\partial}{\partial x_k} - ia_k)A^{-1/2}$ associated with A, $k = 1, \cdots, n$, are bounded from the Hardy space H^1_A into L^1. By interpolation, the Riesz transforms T_k are bounded on L^p for all $1 < p \leq 2$. We will also show that when a function $b \in {\rm BMO}(\mathbb{R}^n)$, the commutators with the Riesz transforms $[b, T_k](u) = T_k(bu) - bT_k(u)$ are bounded on L^p spaces for all $1 < p \leq 2$. This is joint work with Lixin Yan and El Maati Ouhabaz.

LINGLING FAN
Memorial University

Strongly clean property +and stable range one of rings

Let R be an associative ring with identity $1 \neq 0$. An element $a \in R$ is called clean if $a = e + u$ with e an idempotent and u a unit of R and a is called strongly clean if, in addition, $eu = ue$. A ring R is called clean if every element of R is clean and R is strongly clean if every element of R is strongly clean. When is a matrix ring over a strongly clean ring strongly clean? Does a strongly clean ring have stable range one? For these open questions, we prove that $\mathbb{M}_n(C(X))$ is strongly π-regular (hence, strongly clean) where $C(X)$ is the ring of all real valued continuous functions on X with X a P-space; $C(X)$ is clean iff it has stable range one; and a unital C^*-algebra in which every element is self-adjoint is clean iff it has stable range one. The criteria for the rings of continuous complex valued functions $C(X, \mathbb{C})$ to be strongly clean is given.

TUOMAS HYTONEN
University of Helsinki

Kato's square root problem in Banach spaces

Joint work with Alan McIntosh and Pierre Portal.

NIR LEV
Tel-Aviv University

Span of translates in $L^p(R)$, and zeros of Fourier transform

A function $f \in L^p(R)$ is called a generator if the set of all translates of f spans the whole space $L^p(R)$. We discuss recent progress in the problem of characterization of generators in terms of zeros of the Fourier transform. This subject is closely related to a problem of uniqueness for trigonometric series. Joint work with A. Olevskii.

TAO MEI
Texas AM University

Tent Spaces associated with semigroup of operators

Tent spaces were introduced by Coifman, Meyer and Stein in 1980's. They are well adapted for the study of many subjects in the classical analysis. However, its definition relies on two geometric object of Euclidean spaces: "cones" and "cubs" which make it difficult to consider its generation in the case where geometric structure are missing. We define and study Tent spaces by using semigroup of operators. As an application, we prove a duality inequality for $H^1 - BMO$ spaces associated with general subordinated Poisson semigroups.

KASSO OKOUDJOU
University of Maryland

Local well-posedness of nonlinear dispersive equations on modulation spaces

In this talk, we shall present some new time-frequency estimates for certain Fourier multipliers. As an application, we obtain some improved local well-posedness results for certain nonlinear Schrödinger equations with Cauchy data in modulation spaces. This is joint work with A. Benyi, K. Gröchenig and L. Rogers.

RICHARD ROCHBERG
Washington University at St Louis

Capacity, Carleson Measures, and Boundary Behavior

I will discuss the following result: For a large class of function spaces, X, on the disk the boundary sets of $X-$capacity zero are exactly those which carry no non-trivial X-Carleson measure. This gives a new approach to results such as Beurling's classical result that functions in the Dirichlet space have radial limits on all radii outside an exceptional set of directions of capacity zero. I will also discuss how our approach, which is primarily geometric, adapts to classes of non-holomorphic functions such as harmonic or $p-$harmonic functions in n-space. (joint work with Nicola Arcozzi and Eric Sawyer)

TAVAN T. TRENT
University of Alabama

AN ALGORITHM FOR CORONA SOLUTIONS (WITH BOUNDS) FOR $H^\infty(D)$

In 1962, Carleson solved the corona problem for $H^\infty(D)$ and provided estimates on the solutions. For this talk, we discuss an algorithm to construct corona solutions(with bounds) for $H^\infty(D)$ and provide a simple example to illustrate it. A small modification of this algorithm produces an extremal solution which is a constant multiple of an inner function.

IGNACIO URIARTE-TUERO
University of Missouri

Removability problems for bounded, BMO and Hölder quasiregular mappings

A classical problem in complex analysis is to characterize the removable sets for various classes of analytic functions: Hölder, Lipschitz, BMO, bounded (this last case gives rise to the analytic capacity and the Painlevé problem which has been recently solved by Tolsa.) One can ask the same questions in the setting of K-quasiregular maps (since they are a K-quasiconformal map followed by an analytic map.) The K-quasiregular maps are precisely the solutions to the Beltrami equation, and have found applications in areas such as nonlinear elasticity, and electrical impedance tomography. Most of the bounded case was dealt with in a joint paper with K. Astala, A. Clop, J.Mateu and J.Orobitg, [ACMOUT]. The BMO case was dealt with in [ACMOUT] except for a gap at the critical dimension (Question 4.2 in [ACMOUT].) I answered the question filling the gap in [UT]. The Lipschitz case was dealt with by A. Clop, as well as most of the Hölder case, where again a gap at the critical dimension was left. In a joint paper with A. Clop [CUT] we

closed the gap. I will summarize the results and give some ideas of the proofs in the above papers. The talk will be self-contained. References: [ACMOUT] Kari Astala, Albert Clop, Joan Mateu, Joan Orobitg and Ignacio Uriarte-Tuero. Distortion of Hausdorff measures and improved Painlevé removability for bounded quasiregular mappings. Duke Math J., to appear. [CUT] Albert Clop and Ignacio Uriarte-Tuero. Sharp Nonremovability Examples for Hölder continuous quasiregular mappings in the plane. Submitted. [UT] Ignacio Uriarte-Tuero. Sharp Examples for Planar Quasiconformal Distortion of Hausdorff Measures and Removability. Submitted.

ALEXANDER VOLBERG
Michigan State University

Uniqueness Theorem for Cauchy Potential

In what sense a function and its Cauhy transform can have disjoint support? What are compactly supported measures on the plane whose Cauchy transform vanishes a.e. with respect to this measure? These questions concern the so-called reflectionless measures which play an important part for the theory of Schroedinger operators with ergodic potential and almost periodic Jacobi matrices. We present the information we know about such measures. We will meet a bit of Geometric Measure Theory and harmonic measure estimates in this talk.

DECHAO ZHENG
Vanderbilt University

Beurling type theorem on the Bergman space via the Hardy space of the bidisk

In this talk, I will present a new proof of the Beurling type theorem on the Bergman space of Aleman, Richter and Sundberg via the Hardy space of the bidisk. This is a joint work with Shunhua Sun.