Analysis Seminar Thursday November 9, 2017

Speaker John Akeroyd

Title: *A low budget theorem for the index of the shift and nontangential limits*

Abstract: Let μ be positive Borel measure with support in $\{z \in \mathbb{C} : |z| \leq 1\}$ and suppose that $1 \leq t < \infty$. We assume that the closure of the analytic polynomials in $L^t(\mu)$, namely $P^t(\mu)$, is irreducible. The "shift" $S(f) := zf(z)$ defines a bounded operator on $P^t(\mu)$. Let $\mathcal{M}$ be a closed invariant subspace for the shift on $P^t(\mu)$. We review results in the literature on the index of the shift on $\mathcal{M}$; that is, $\dim(\mathcal{M}/z\mathcal{M})$. These fall into just two cases: (A) $\mu(\{z : |z| = 1\}) = 0$ and (B) $\mu(\{z : |z| = 1\}) > 0$. We spend most of our time reviewing case (B), where nontangential limits enter the picture. Along the way, we outline some elementary methods of proof that have been overlooked in the literature.