ANALYTIC MODELS, DILATIONS, WANDERING SUBSPACES, AND INNER FUNCTIONS

In this talk we will discuss an analytic model theory for pure hypercontractions (introduced by J. Agler) which is analogous to Sz.Nagy-Foias model theory for contractions. We then proceed to study analytic model theory for doubly commuting n-tuples of operators and analyze the structure of joint shift co-invariant subspaces of reproducing kernel Hilbert spaces over polydisc. In particular, we completely characterize the doubly commuting quotient modules of a large class of reproducing kernel Hilbert Modules, in the sense of Arazy and Englis, over the unit polydisc.

Inspired by Halmos, in the second half of the talk, we will focus on the wandering subspace property of commuting tuples of bounded operators on Hilbert spaces. We prove that for a large class of analytic functional Hilbert spaces H_k on the unit ball in $\mathbb{C}^n$, wandering subspaces for restrictions of the multiplication tuple $M_z = (M_{z_1}, \ldots, M_{z_n})$ can be described in terms of suitable H_k-inner functions. We also prove that H_k-inner functions are contractive multipliers and deduce a result on the multiplier norm of quasi-homogeneous polynomials as an application. Along the way we also prove a refinement of a result of Arveson on the uniqueness of the minimal dilations of pure row contractions.