#1 (Tuesday)

Games in Banach spaces

Abstract: Let X be a separable infinite dimensional Banach space. We explore the theory and consequences of certain games on Banach spaces of the following type. Player S, the subspace player, chooses $X_1 \subseteq X$, an infinite dimensional subspace (possibly restricted to be of finite co-dimension) and player V, the vector player, chooses $x_1 \in S_{X_1}$ = the unit sphere of X_1. Plays alternate in this fashion. Plays may stop at a prescribed integer n or may continue forever. What sort of sequences (x_i) can V be assured of choosing? What class of (x_i)'s can S force V to choose? If S can force a certain outcome, e.g., $\|\sum a_i x_i\| \sim (\sum |a_i|^p)^{1/p}$, what does this imply about the structure of X?

#2 (Thursday)

Coefficient Quantization in Banach spaces

Abstract: The Banach space c_0 has the following property. If (e_i) is the unit vector basis for c_0 then for all $\varepsilon > 0$ there exists $\delta > 0$ so that for all $x = \sum_F a_i e_i \in c_0$, $|F| < \infty$, then there exists $y = \sum_F n_i \delta e_i$, $n_i \in \mathbb{N}$, with $\|x - y\| \leq \varepsilon$. (In fact $\delta = 2\varepsilon$ works.) We consider the problem of what other bases (e_i) have this property and what spaces have a basis with the property. We also consider the same question for systems weaker than bases and for variations of the property. For example every X contains a discrete subgroup (ε-separated) which is M-dense in X.

#3: (Friday)

Small subspaces of L_p

Abstract: We discuss the "small" subspaces of $L_p[0,1]$, namely ℓ_p, ℓ_2, $\ell_p \oplus \ell_2$ and $(\sum \ell_2)_{\ell_p}$, with regard to the problem: Given a subspace X of L_p when does X contain or embed into one of the above spaces. We'll review some of the 40^+ year history and also give some recent new results.