Abstract:
Suppose that $J \subseteq R^d$ is a compact set with nonempty interior.
Let $\{n_k\}_{k \geq 1}$ be a sequence of positive integers, and let $\Phi = \{\Phi_k\}$ be a sequence of positive real vectors, where $\Phi_k = (c_{k,1}, c_{k,2}, ..., c_{k,n_k})$, $\sum_{1 \leq j \leq n_k} c_{k,j} \leq 1, k \in N$.
Suppose that $\mathcal{F} = \{J_\sigma : \sigma \in \mathcal{D}\}$ is a collection of subsets of $R^d$, we say that the collection $\mathcal{F}$ possesses the Moran structure if it satisfies the following Moran Structure Conditions (MSC):

1°. $J_\emptyset = J$;

2°. For any $\sigma \in D$, $J_\sigma$ is similar to $J$, that is, there exists a similarity $S_\sigma : R^d \to R^d$, such that $J_\sigma = S_\sigma(J)$; where $D = \bigcup D_k$, $D_k = \{(i_1, ..., i_k) : 1 \leq i_j \leq n_k\}$. Moreover, if $\sigma = (i_1, ..., i_k) \in D_k$, $\tau = (j_1, ..., j_m) \in D_m$, we write $\sigma \ast \tau = (i_1, ..., i_k, j_1, ..., j_m)$.

3°. For any $k \geq 0$ and $\sigma \in D_k$, $J_{\sigma+1}, ..., J_{\sigma+n_k}$ are subsets of $J_\sigma$, and if $i \neq j$, then $\text{int}(J_{\sigma+1}) \cap \text{int}(J_{\sigma+2}) = \emptyset$, where $\text{int}(A)$ is the interior of $A$.

4°. For any $k \geq 1$, and for any $\sigma \in D_{k-1}$, $1 \leq j \leq n_k$, we have $\frac{|J_{\sigma+1}|}{|J_\sigma|} = c_{k,j}$.

Now let $\mathcal{F}$ be a collection of subsets of $R^d$ possessing the Moran structure, let $E_k = \bigcup_{\sigma \in D_k} J_\sigma$, and let $E = \bigcap_{k \geq 0} E_k$,

then $E$ is a nonempty compact set.

The set $E : = B(\mathcal{F})$ is called the Moran set determined by the collection $\mathcal{F}$.

We stress two points for the structure of the Moran set, the contracting coefficients of the successive generators may vary and the relative places among the successive generators may be different. Through these differences, we will obtain some new interesting properties of the different dimensions of Moran sets.

Friday, April 17, 1998
3:00 PM in 335 Jabara Hall

Please come welcome our guest and join us for refreshments before the lecture at 2:30 p.m. in room 353 Jabara Hall.