Topology Seminar

Larry Guth

of MIT will be speaking on

Contraction of areas and homotopy-type of mappings

on September 24 at 4:30 in
MIT Room 2-131

I'm going to talk about connections between the geometry of a map and its homotopy type. Suppose we have a maps from the unit m-sphere to the unit n-sphere. We say that the k-dilation of the map is $< L$ if each k-dimensional surface with k-dim volume V is mapped to an image with k-dim volume at most LV. Informally, if the k-dilation of a map is less than a small ϵ, it means that the map strongly shrinks each k-dimensional surface. Our main question is: can a map with very small k-dilation still be homotopically non-trivial? Here are the main results. If $k > (m + 1)/2$, then there are homotopically non-trivial maps from S^m to S^{m-1} with arbitrarily small k-dilation. But if $k \leq (m+1)/2$, then every homotopically non-trivial map from S^m to S^{m-1} has k-dilation at least $c(m) > 0$.