Analysis Seminar

Title: Killing Gruenhage spaces in ZFC

Speaker: R. Smith

Date: Tue 25th January 2011 at 4:00PM

Location: Mathematical Sciences Seminar Room

Abstract: A topological space X of cardinality at most the continuum is called Gruenhage if there is a countable sequence of open subsets (U_n), such that given distinct $x, y \in X$, there exists n such that either x or y is in U_n, but not both.

A space X has a G_δ-diagonal if its diagonal is a G_δ set in X^2 with the usual product topology.

Both notions concern the separation of distinct points in a controlled way, without using 'too many' open sets. The classes of Gruenhage spaces and spaces having G_δ-diagonals contain all metric spaces, together with some much wilder objects. Recently, the two classes have been shown to be relevant to Banach space geometry, but the relationship between them has been unclear.

In this talk, we present an example of a locally compact, Hausdorff, non-Gruenhage space having a G_δ-diagonal. It improves upon a previous example of the speaker's, which relied on the continuum hypothesis.