Analysis Seminar

Title: A topological characterization of dual strict convexity in Asplund spaces I

Speaker: Richard Smith

Date: Tue 23rd April 2019 at 4:20PM

Location: Seminar Room SCN 1.25

Abstract: In 1975 Lindenstrauss asked whether it is possible to characterize Banach spaces X that admit an equivalent strictly convex norm, in terms of other linear or topological properties of X. We provide a partial answer to this problem in the case of dual spaces, by showing that if X is an Asplund space, then it admits an equivalent norm having a strictly convex dual norm if and only if the dual unit sphere S_{X^*} (equivalently X^*), endowed with the w^*-topology, possesses a certain topological property. It follows that this ostensibly geometric property of the space can in fact be characterised in purely non-linear, topological terms.

In the first of two talks we will cover the background to the problem, the basic concepts involved, and give an introduction to the main technique of the proof, which is a type of set-theoretic derivation or 'eating' process. Such processes are usually indexed by natural numbers or ordinal numbers, but this one is indexed instead by elements of a certain tree.