John Greenlees | University of Warwick

Title: The singularity category of C^*(BG)

Abstract: The singularity category D_{sg}(R) of a commutative Noetherian local ring R is the quotient of the bounded derived category D^b(R) by the category of compact objects D^c(R).

By the theorem of Auslander-Buchsbaum-Serre, D_{sg}(R) is trivial if and only if R is regular, and in general D_{sg}(R) allows one to study the deviation from regularity.

If we want to do something similar for a more general ring spectrum R, the first obstacle is to define the bounded derived category. The talk will describe a good way to do this when R=C^*(BG), and the resulting singularity category is again trivial if and only if C^*(BG) is regular, which is to say (for finite groups G) if and only if G is p-nilpotent.

The talk will focus on joint work with Dave Benson calculating the singularity category when G has cyclic Sylow p-subgroup, and may include speculation on more general behaviour.

This project started to make progress at the CRM in 2015, in conversations with Greg Stevenson.