Seminar

Prof. Thomas Schick

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Strange values of L2-Betti numbers for positive characteristic

Thursday, March 3, 2016

at 14:00 h

ESI, Boltzmann Lecture Hall

Abstract:

Classical L2-Betti numbers for a group G (or more generally for spaces with free G-action) can be defined as a limit of ordinary Betti numbers via approximations of a group by finite objects (finite quotients; more general sofic approximations). These approximation results are theorems (the initial one due to Lück).

However, they serve as the only known definition for a variant of this concept which works with coefficient fields of positive characteristic.

There, many questions are open; in particular for general sofic approximations of a group (in particular, to which extend one has independence of the approximation).

This is settled in the case the group is amenable; on which the talk will focus. We will explain a full fledged rank function on very general FG modules (where F is a finite field and G an amenable group) due to **Johannes Neumann** (improving on work in particular of Elek).

We will also report on recent constructions of examples (due to the author with **Lukasz Grabowski** and **Johannes Neumann**), where the resulting values of the L2-Betti numbers are "strange": they can take rather arbitrary (non-rational, non-algebraic) values. This shows that no kind of Atiyah conjecture can hold in general in this context.

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February 23, 2016