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*Relating the structure of a group to the module-theoretic properties of the group von Neumann algebra over the complex group ring.*

The topic of interest is relating the structure of a group to the structure of certain modules over the complex group ring. In particular, the modules  $L^p(G)$  and the group von Neumann algebra  $N(G)$  are of interest. Flatness and a notion of “dimension-flatness” are the main module-theoretic properties that have been looked at. For example, If  $N(G)$  is flat over  $\mathbb{C}G$ , what can that tell us about the structure of the group? What if  $N(G)$  is dimension-flat? There are conjectures relating these hypotheses to the number of ends of a group and to the amenability of a group, respectively. Partial results and motivating examples built off the work of Peter Linnell, Wolfgang Lück and others have been found. (Received September 22, 2011)