

Rigidity theory for von Neumann algebras

Stefaan Vaes
(KU-Leuven, Belgium)

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Aula Naranja, ICMAT

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<https://youtu.be/o2P0MB98ims>



Discrete groups and their actions on probability spaces give rise to algebras M of Hilbert space operators. The concept of amenability for groups, discovered by von Neumann in his explanation of the Banach-Tarski paradox, leads to a sharp dichotomy for these II_1 factors M . If the group is amenable, M is always isomorphic to the unique hyperfinite II_1 factor, by Connes' theorem. When the group is nonamenable, Popa's deformation/rigidity theory leads to striking rigidity results. This includes W^* -superrigidity theorems where the group and its action can be entirely recovered from the ambient II_1 factor. I will give a survey of some of these results, including the challenging problem to decide when a given II_1 factor can be embedded into another one.