259B Winter 2018: "Algebras of Operators in Hilbert Space"

Instructor: Sorin Popa
Meetings: MWF 3-3:50 in MS5138.

This course is a continuation of 259A from Fall 2017, following up on the topics in the theory of II_1 factors that were proposed in the presentation of that course (see http://www.math.ucla.edu/ popa/259aFall2017.pdf).

Thus, we will first discuss the problem of *paving* over MASAs in II_1 factors, i.e. generalized Kadison-Singer problems (following https://www.imj-prg.fr/ao/IMG/pdf/kyotolectures.pdf).

The rest of the course will focus on deformation-rigidity theory and classification of various classes of II_1 factors (arising from groups, group actions and amalgamated free products) and for obtaining $W*$-rigidity results. This will begin with a detailed study of *intertwining* techniques, allowing to decide when two subalgebras of a II_1 factor can be unitary conjugate. Then we will prove that the group factor of $PSL(2,\mathbb{Z})$ has trivial fundamental group, and that Bernoulli actions of non-amenable groups give rise to orbit equivalence relations and II_1 factors with extremely rigid structure.

The only prerequisite for this class is basic knowledge in II_1 factor theory, for which we recommend the first few chapters of the book http://www.math.ucla.edu/∼popa/Books/IIun-v13.pdf,

All people attending the class will get an A, but will have to make at least one presentation in our Operator Algebra Participating Seminar 290I, Mondays 4-5:30pm in MS5137.