Property (T), fixed point properties and strengthening

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Kazhdan's property (T) is one of the most fundamental properties in the analytic counterpart of geometric group theory. By Delorme–Guichardet theorem, this property is equivalent to the fixed point property (FH) for locally compact sigma-compact groups: A group is said to have property (FH) if every (continuous) action of it on every Hilbert space by affine isometries admits a global fixed point.

We overview these two notions (the original definition of property (T) has totally different nature to (FH)), and proceed to their strengthening defined by replacing Hilbert spaces with other Banach spaces. They have applications to coarse geometry via "(ordinary or Banach) expander graphs". We discuss theory on these topics, including recent developments.

No serious backgrounds are assumed in this lecture series. Prerequisites are similarities to examples of infinite groups (definitions of $\mathrm{SL}(n, \mathbb{Z})$ and $\mathrm{SL}(n, \mathbb{R})$, etc.) and to basic functional analysis (definitions of Hilbert spaces, orthogonal complement, unitary representations; Banach spaces, continuous duals, reflexivity, quotient Banach spaces, Lebesgue and sequence L_p spaces, etc.). Some definitions will be recalled during the lectures, if necessary.

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This will be a two-week course consisting of 6 x 2 hours of lectures and additional problem sessions led by Biswarup Das. The course is aimed at Master and PhD students (It is worth 3 ECTS points).

The lectures will take place on:

Tuesday, 3.10, 14:00–16:00, room 605
Wednesday, 4.10, 15:00–17:00, room 605
Friday, 6.10, 12:00–14:00, room 605
Tuesday, 10.10, 14:00–16:00, room 605
Wednesday, 11.10, 15:00–17:00, room 605
Friday, 13.10, 12:00–14:00, room 605

The problem sessions will take place on:

Tuesday, 3.10, 12:00–14:00, room 606
Wednesday, 4.10, 13:00–15:00, room 605
Thursday, 5.10, 12:00–14:00, room 604
Tuesday, 10.10, 12:00–14:00, room 606
Wednesday, 11.10, 13:00–15:00, room 605
Thursday, 12.10, 12:00–14:00, room 604

Further details at http://www.math.uni.wroc.pl/~dosaj/Wroc/Seminars/17Masato.html