



## Geometric Group Theory at Royal Holloway on Friday, 11th January 2019

Talks will be held at Room 219 in McCrea Building at the Main Campus (Map attached). Lunch and coffee will be served at the staff common room in Room 327 McCrea.

The Campus is ca 20 minute walk away from Egham Train station; more information can be found here: <https://www.venue.royalholloway.ac.uk/getting-here/>

Everybody is welcome. To help with catering, could you please let me know if you will attend ([brita.nucinkis@rhul.ac.uk](mailto:brita.nucinkis@rhul.ac.uk)).

12:30-13:15 Sandwich Lunch

13:15-14:15 Cornelia Drutu (Oxford): “Superexpanders and warped cones”

14:30-15:30 Jose Burillo (Barcelona): “An irrational-slope Thompson’s group”

15:30-16:00 Coffee Break

16:00-17:00 Lawrence Reeves (Melbourne): “Commutators in groups of piecewise projective homeomorphisms”

Abstracts:

Cornelia Drutu: “Superexpanders and warped cones”

Abstract: Superexpanders are expanders that do not embed coarsely in super reflexive Banach spaces. There are for the moment very few constructions of super expanders. The latest displays interesting connections with John Roe’s concept of warped cone, a metric space associated to the action of an infinite group on a compact space, which turned out to be a metric counter-example to the Baum-Connes conjecture. Random graphs are presumably sources of superexpanders even though for the moment this is not known. Some results are known, about expansion features of random graphs considered with respect to particular types of Banach spaces. In this talk I shall present the latest results on super expanders, based on work of several authors (Tim de Laat, Mikael de la Salle, Federico Vigolo, Damian Sawicki, John MacKay and myself).

Jose Burillo: “An irrational-slope Thompson’s group”

Abstract: Let  $\tau = 0.618\dots$  be the small golden ratio, zero of the polynomial  $x^2 + x - 1$ . In 1995 Sean Cleary introduced the irrational-slope Thompson's group  $F_\tau$ , which is the group of piecewise-linear maps of the interval  $[0, 1]$  with breaks in  $\mathbb{Z}[\tau]$  and slopes powers of  $\tau$ . In this talk I will describe this group using tree-pair diagrams in Thompson's group style, and then I will show a finite presentation, a normal form, and prove that its commutator subgroup is a simple group. This group is the first example of a group of piecewise-linear maps of the interval whose abelianisation has torsion, and it is an open problem whether this group is a subgroup of Thompson's group  $F$ .

Lawrence Reeves: "Commutators in groups of piecewise projective homeomorphisms"

Abstract: The Lodha-Moore groups are finitely presented counterexamples to the von Neumann-Day conjecture. They appear as subgroups of a group of piecewise projective maps constructed by Monod. We study their commutators and second commutators, showing some of them are simple. This is joint work with Jose Burillo and Yash Lodha.