

## Geometry, Topology and Dynamics Seminar

### *Growth of torsion in low homology groups of arithmetic lattices and mapping class groups*

Mikolaj Fraczyk (Renyi Institute)

**Abstract:** Let  $\Gamma$  be a finitely generated countable group and let  $\Gamma_n$  be a sequence of subgroups. We are interested in the growth of  $\log |H_k(\Gamma_n, \mathbb{Z})_{\text{tors}}|$  as the index  $[\Gamma : \Gamma_n]$  goes to infinity. We will focus on the cases when  $\Gamma$  is either the mapping class group of a genus  $g \geq 2$  surface or  $\Gamma = \text{SL}(d, \mathbb{Z})$  with  $d \geq 3$ . For these groups we are able to show that under some natural conditions on  $(\Gamma_n)$  the logarithm of  $|H_k(\Gamma_n, \mathbb{Z})_{\text{tors}}|$  grows as  $o([\Gamma : \Gamma_n])$  when  $k \leq 3g - 4, d - 2$  respectively. To prove these estimates we consider the action of  $\Gamma$  on the curve complex (in the mapping class group case) or the rational Tits complex (in the  $\text{SL}(d, \mathbb{Z})$  case) and use them to build an explicit "low dimensional" projective resolution. This is a joint work with Miklos Abert, Nicolas Bergeron and Damien Gaboriau.

Monday, March 11 at 3:00 PM in 636 SEO