

Oberseminar Geometrie	Wednesday 22nd May 2013
Department of Mathematics	10:20–12:00
University of Fribourg	Seminar room, Math. II (Lonza)

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‘Counting hyperbolic manifolds and commensurability classes.’

A result of M. Burger, T. Gelander, A. Lubotzky and S. Mozes states that the number $N_n(v)$ of hyperbolic n -manifolds having hyperbolic volume less than v has the growth type of v^v , that is there are positive constants a_n and b_n such that

$$a_n v \log v \leq \log N_n(v) \leq b_n v \log v.$$

The lower bound is obtained by counting finite covers of a given manifold M whose fundamental group surjects onto a nonabelian free group, and this shows that there are (very roughly!) ‘as many’ arithmetic as non-arithmetic manifolds since one can choose M to be either one or the other. But when one counts commensurability classes, a refinement of the construction by Gromov and Piatetski-Shapiro of nonarithmetic manifolds shows that there are a lot more non-arithmetic classes than arithmetic ones: the latter is subexponential by a general result of M. Belolipetsky while the former is at least exponential, and could actually be hoped to have the same growth type as $N_n(v)$.”