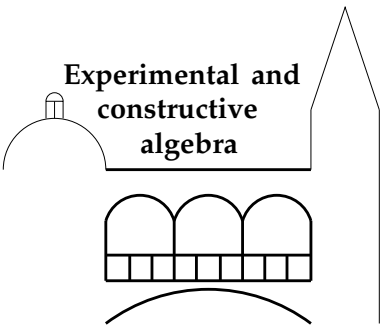
Graduiertenkolleg

Experimentelle und konstruktive Algebra



Kolloquiumsvortrag

Dienstag, 18. Juli 2017, 14:00 Uhr, SeMath

Peter Abramenko (University of Virginia, USA):

Some countable groups which cannot be finitely generated or presented

For many countable integral domains R, the groups $\mathrm{SL}_2(R)$ cannot be finitely generated. A typical example is $\mathrm{SL}_2(k[t])$ for the polynomial ring $k[t]$ over a field k. For infinite k, it is very easy to see that $\mathrm{SL}_2(k[t])$ is not finitely generated. It is less trivial for finite k, in which case the action of $\mathrm{SL}_2(k[t])$ on a suitable (Bruhat-Tits) tree is a useful tool. Variants of this approach can be applied to a large class of integral domains R instead of $k[t]$. However, for the Laurent polynomial ring $R = k[t, 1/t]$ over a finite field k, one easily verifies that $\mathrm{SL}_2(R)$ is finitely generated. Now using the action of this group on a product of two (Bruhat-Tits) trees, one can show that $\mathrm{SL}_2(k[t, 1/t])$ is not finitely presented. This approach can be generalized in order to show that many Kac-Moody groups over finite fields, which are not of 2-spherical type, are not finitely presented. An important ingredient of this proof is a result by Gandini, which (based on a theorem by Kropholler) gives necessary conditions for finiteness properties of certain groups acting on contractible CW-complexes.

Wir laden alle Interessierten herzlich ein.