1053-20-1 **Kai-Uwe Bux***, Fakultät für Mathematik, Universität at Bielefeld, Germany. Arithmetic groups in positive characteristic.

The connection of topology and group theory is via the fundamental group: every group G arises as the fundamental group of some space Y. In fact, Y can be chosen to be a CW complex with contractible universal cover. In this case, we say that Y is an Eilenberg-MacLane complex for G. It turns out that G determines its Eilenberg-MacLane complex up to homotopy equivalence. Hence, homotopy-invariants (e.g., homology and cohomology) of Y are actually invariants of G. Another source of obtaining invariants for the group G is to employ the ambiguity inherent in the Eilenber-MacLane complexes for G. The geometric dimension of G is the minimum dimension of an Eilenberg-MacLane complex for G. The finiteness length of G is the maximum m for which there is an Eilenberg-MacLane complex for G with finite m-skeleton. The finiteness length of G is >= 1 if and only if G is finitely generated and the finiteness length is >= 2 if and only if G is finitely presented.

Arithmetic groups, such as $SL_n(Z)$, $SL_n(Z[1/3])$, $SL_n(F_q[t])$, or $SL_n(F_q[t, 1/t])$ where F_q is a finite field provide a good case study for finiteness properties since they depend on two parameters that can be varied independently: one has to choose the group scheme (in our case SL_2 , SL_3 , ...) and the coefficient ring Z, Z[t], $F_q[t]$, ...; the interesting question is how the finiteness length depends on the choice of these parameters. I will describe what is known with respect to this problem and what is conjectured (recently there has been mounting evidence for a particular conjecture that would settle the question for semi-simple groups). I also intend to at least point toward yet uncharted territory where only scattered results are known.No text available. (Received June 11, 2008)