Meeting: 1006, Lubbock, Texas, SS 15A, Special Session on Discrete Groups, Homogeneous Spaces, Rigidity

1006-22-91 **T Gelander*** (tsachik.gelander@yale.edu), 10 Hillhouse Ave, New Haven, CT 06520-8283, and **E Breuillard**. *Free subgroups of linear groups.*

I'll describe 2 generalizations of Tits' alternative proved by E. Breuillard and me, 1) topological and 2) effective:

1) Let k be a local field and $G < GL(n, K)$ a linear group over k. Then either G contains an open solvable subgroup or it contains a dense free subgroup.

For $k = R$ this answers a question of Carriere and Ghys and provides a short proof for a conjecture of Connes and Sullivan on amenable actions which was first proved by Zimmer. For k non-Archimedean it implies a conjecture of Dixon, Pyber, Seress and Shalev about profinite groups. It also settles a conjecture of Carriere on the growth of the leaves in Riemannian foliations of compact manifolds.

2. Let G be a non-virtually solvable finitely generated linear group, then there is a constant M such that for any generating set S of G, S^M contains generators of a non-abelian free group.

This improves Eskin-Mozes-Oh theorem that such groups have uniform exponential growth. (Received February 08, 2005)