



THE WEIZMANN INSTITUTE OF SCIENCE  
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Algebraic Geometry and Representation Theory Seminar

Room 1 ,Ziskind Building  
on Wednesday, Apr 13, 2016  
at 11:15

please note change in room

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An elementary proof of Olshanskii's theorem on subgroups of a free group and its  
applications

Abstract:

I will present an elementary proof of the following theorem of Alexander Olshanskii:

Let  $F$  be a free group and let  $A, B$  be finitely generated subgroups of infinite index in  $F$ . Then there exists an infinite index subgroup  $C$  of  $F$  which contains both  $A$  and a finite index subgroup of  $B$ .

The proof is carried out by introducing a 'profinite' measure on the discrete group  $F$ , and is valid also for some groups which are not free. Some applications of this result will be discussed:

1. Group Theory - Construction of locally finite faithful actions of countable groups.
2. Number Theory - Discontinuity of intersections for large algebraic extensions of local fields.
3. Ergodic Theory - Establishing cost 1 for groups boundedly generated by subgroups of infinite index and finite cost.