

Department of Mathematics, BGU

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# Geometry and Group Theory

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*On Sunday, April, 30 2017*

*At 14:30 – 15:30*

*In 101-*

Michal Marcinkowski

will talk about

## **Aut-invariant metrics and Aut-invariant quasimorphisms on free groups and surface groups.**

Abstract: There are two interesting norms on free groups and surface groups which are invariant under the group of all automorphisms:

A) For free groups we have the primitive norm, i.e.,  $|g|_p$  = the minimal number of primitive elements one has to multiply to get  $g$ .

B) For fundamental group of genus  $g$  surface we have the simple curves norm, i.e.,  $|g|_s$  = the minimal number of simple closed curves one need to concatenate to get  $g$ .

In our recent paper with M. Brandenbursky we prove the following dichotomy: either  $|g^n|$  is bounded or grows linearly with  $n$ . For free groups and surface groups we give an explicit characterisation of (un)bounded elements.

In two talks I will explain the idea of the proof and draw a number of consequences. The proof uses the theory of mapping class groups (i.e. Nielsen-Thurston normal form, Birman embedding) and quasimorphisms.