

Department of Mathematics, BGU

Colloquium

On Tuesday, December ,7 2021

At 14:30 – 15:30

In Math 101-

Oren Becker (University of Cambridge)

will talk about

Character varieties of random groups

Abstract: The space $\text{Hom}(\Gamma, G)$ of homomorphisms from a finitely-generated group Γ to a complex semisimple algebraic group G is known as the G -representation variety of Γ . We study this space when G is fixed and Γ is a random group in the few-relators model. That is, Γ is generated by k elements subject to r random relations of length L , where k and r are fixed and L tends to infinity.

More precisely, we study the subvariety Z of $\text{Hom}(\Gamma, G)$, consisting of all homomorphisms whose images are Zariski dense in G . We give an explicit formula for the dimension of Z , valid with probability tending to 1 and study the Galois action on its geometric components. In particular, we show that in the case of deficiency 1 (i.e., $k-r=1$), the Zariski-dense G -representations of a typical Γ enjoy Galois rigidity.

Our methods assume the Generalized Riemann Hypothesis and exploit mixing of random walks and spectral gap estimates on finite groups.

Based on a joint work with E. Breuillard and P. Varju.