

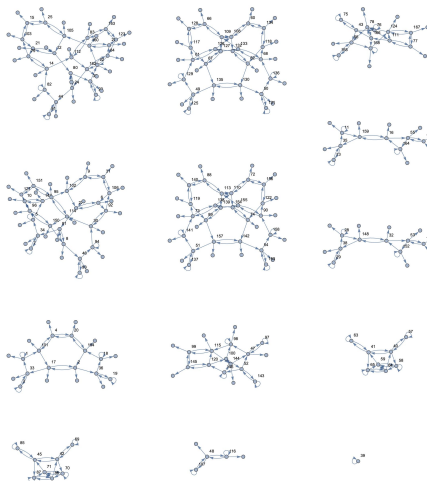
Student Research Talks (StReeTs)

George Mason University

Dynamics of the outer automorphism group action on finite field points of character varieties

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Orbits under the action of a set of generators of $\text{Aut}(\mathbb{Z}^2)$ on $\text{Hom}(\mathbb{Z}^2, \text{SL}_2(\mathbb{F}_3))$.

Abstract

Varieties are mathematical objects that arise as simultaneous zero sets of a collection of polynomials. If G is a reductive algebraic group over \mathbb{Z} , the G -character variety of a finitely presented group Γ parametrizes the set of closed conjugation orbits in $\text{Hom}(\Gamma, G)$. The group of outer automorphisms, $\text{Out}(\Gamma)$, naturally acts on the character variety. The dynamics of this action on the finite field points of character variety is particularly interesting. We explore the transitivity properties of this action. Specifically, we show that when Γ is of free type, that is, $\text{Aut}(\Gamma)$ has certain desirable properties, the action is transitive on the set of epimorphisms from Γ to G . We define *asymptotic transitivity* to be the ratio of the size of a maximal orbit to that of the character variety as $q \rightarrow \infty$, and explore this property of $\text{Out}(F_r)$ action on the $\text{SL}_n(\mathbb{F}_q)$ -character variety of F_r determined by r -tuples of pairwise commuting matrices when $n = 2, 3$.

Date: Friday, November 12, 2021

Time: 2:30pm–3:20pm

Place: Exploratory Hall 4106

Pizza will be served at the presentation.

For further information or for special accommodations (including dietary restrictions), please contact Tracey Oellerich or Aleyah Dawkins via email at toelleri@gmu.edu or adawkin@gmu.edu by Thursday.