1154-VS-2715 **Julia Cai*** (julia.cai@yale.edu), **Benjamin Hutz**, **Leopold Mayer** and **Max Weinreich**.

Automorphisms of Rational Functions over Fields of Characteristic $p > 0$.

Given an algebraically closed field K, the group $\mathrm{PGL}_2(K)$ acts on the the set of all rational maps $\phi : \mathbb{P}^1(K) \to \mathbb{P}^1(K)$ by conjugation. Given a map ϕ, we can compute its automorphism group $\mathrm{Aut}(\phi)$, which is the stabilizer of ϕ in $\mathrm{PGL}_2(K)$ under this group action. It is known that $\mathrm{Aut}(\phi)$ is a finite group. Restricting our attention to fields of positive characteristic, we use the classification of finite subgroups of $\mathrm{PGL}_2(K)$ to show that every finite subgroup is isomorphic to $\mathrm{Aut}(\phi)$ for some ϕ.

The action of conjugation creates a natural equivalence relation on Rat_d, the space of degree-d rational maps. We can then consider the quotient space $\mathcal{M}_d(K)$. Under this relation, equivalent maps have isomorphic automorphism groups, so the set of all maps with a non-trivial automorphism group is well defined in $\mathcal{M}_d(K)$. We call this the automorphism locus. The automorphism locus of $\mathcal{M}_2$ has been studied over fields of characteristic 0; we describe the automorphism locus of $\mathcal{M}_2(\overline{\mathbb{F}_p})$, for all primes p, by following techniques from the proof of the former. When $p = 2$, it turns out that the automorphism locus is not Zariski-closed. (Received September 17, 2019)