1108-37-467 **Tracy Lin Payne*** (`payntrac@isu.edu`), Mathematics Department, Idaho State University, 921 S. 8th St., Pocatello, ID 83209-8085. *Applying evolutionary game theory to geometric flows.* Preliminary report.

In the presence of symmetry, the Ricci flow for a manifold may be expressed as a system of ordinary differential equations. Geometric flows for discrete geometries may be expressed as systems of ordinary differential equations as well; one such example is the combinatorial Ricci flow for a triangulated surface.

The equations for the Ricci flow for homogeneous spaces are of the same form as the generalized Lotka-Volterra equations which arise in population biology. Inspired by this, we view geometric flows which can be encoded as a system of ODEs from the point of view of evolutionary game theory. We find that the many familiar geometric flows arise as replicator equations. We propose new geometric evolution laws taken from standard models in evolutionary game theory. One example is the best response flow, a differential inclusion whose trajectories are almost everywhere lines.

We interpret game-theoretic notions such as the Nash equilibrium geometrically, and we apply results from evolutionary game theory to geometric flows. We give phase plane portraits for a variety of geometries and flows. (Received January 19, 2015)