1107-55-499   **Paul M. Alsing**, **Howard A. Blair** and **Matthew Corne*** (`matthew.corne.ctr@us.af.mil`), Rome, NY 13441, and **Gordon Jones**, **Warner A. Miller**, **Konstantin Mischaikow** and **Vidit Nanda**. *Applications of Persistent Homology to Simplicial Ricci Flow.*

We apply the methods of persistent homology to investigate singularity formation in a selection of two and three–dimensional geometries evolved by simplicial Ricci flow, an unstructured mesh formulation of Hamilton's Ricci flow. To implement persistent homology, we construct a triangular mesh for a sample of points. The scalar curvature along the edges of the triangulation, computed as an average of scalar curvatures at the endpoints of the edges, serves as a filtration parameter at each time step. We present and analyze the results of the application of persistent homology to a two–dimensional rotational solid that collapses and three–dimensional dumbbells that manifest neckpinch singularities. We compare the appearance of critical geometric phenomena in these models with the results of the application of persistent homology and conclude that persistent homology does indicate geometric criticality. Finally, we discuss the interpretation and implication of these results and future applications. (Received January 20, 2015)