

1154-VU-2674 **Josh Thompson*** (joshthom@nmu.edu) and **Davin Hemmila** (dahemmil@nmu.edu). *Surgery on Penrose Tilings*. Preliminary report.

The Cartwheel is a well-known Penrose Tiling of the plane. Near the center of this tiling one finds a group of tiles forming a decagon. This decagon, a so-called Cartwheel, forces the remaining tiling. While the tiling is aperiodic, the edges of this decagon bound periodic regions called "Conway worms". We define two surgeries on this tiling that exploit topological properties of these worms and prove results about the resulting objects. The first map collapses the worms and glues the remaining portions together in such a way that the image is quasi-isometric to the original. The second map is a quotient map that identifies each worm and identifies similar edges of the Cartwheel. The image of this map contains a Klein bottle. We discuss this procedure as well as extensions to other geometric designs. (Received September 17, 2019)