1086-37-752 **Filiz Dogru*** (dogruf@gvsu.edu), **Daniel Hast** and **Neil DeBoer**. *On 3-Periodic Orbits of Polygonal Outer Billiards in The Hyperbolic Plane.* Preliminary report.

Outer (Dual) billiards is a simple plane based dynamical system on a convex shape. The subject popularized in the 70's with the search of orbits escape to infinity. In time, some results developed in the Euclidean and the hyperbolic plane. In this talk, we examine small polygonal outer billiard tables have 3-periodic orbits in the hyperbolic plane. We formulate a stronger smallness condition for polygonal tables — which we call triangle-small — and analyze possibilities of 3-periodic orbits. We prove several special cases: polygons with at least three acute or right angles, regular polygons, and quadrilaterals. (Received September 12, 2012)