1131-37-20 **Nandor J Simanyi*** (simanyi@uab.edu), 1300 University Blvd., Suite 452, Birmingham, AL 35294, and **Caleb C Moxley** (ccmoxley@bsc.edu), 900 Arkadelphia Road, Birmingham, AL 35254. *Panorama of Homotopical Complexity of 3D scattering billiards.*

We study the homotopical rotation vectors and the homotopical rotation sets for several cylindric billiard flows on the 3D unit flat torus.

The natural habitat for these objects is the infinite cone erected upon the Cantor set Ends(G) of all ends of the hyperbolic group G of the configuration space. An element of G describes the direction in (the Cayley graph of) the group G in which the considered trajectory escapes to infinity, whereas the height function s of the cone gives us the average speed at which this escape takes place.

The main results obtained so far, jointly with Dr. Caleb Moxley, are radial upper and lower bounds for the star-shaped rotation sets of these models.

Furthermore, we prove the convexity (star-shaped property) of the set AR of constructible rotation vectors, and that the set of rotation vectors of periodic orbits is dense in AR. We also provide effective lower and upper bounds for the topological entropy of the studied billiard flows. (Received May 18, 2017)