1030-05-346 Helene Barcelo\* (barcelo@asu.edu), Department of Mathematics and Statistics, Arizona State University, Tempe, AZ 85287-1804, and Christopher Severs (severs@mathpost.asu.edu), Department of Mathematics and Statistics, Arizona State University, Tempe, AZ 85287-1804. The discrete fundamental group of the associahedron. Preliminary report.

Over the last 50 years, combinatorial simplicial complexes have been extensively studied. One approach has been to study the homotopy groups of posets of faces of such simplicial complexes. More recently, Kramer and Laubenbacher introduced a notion of discrete homotopy, called A-theory, that has given surprising results. For example, Babson and Bjorner showed that the k-th discrete fundamental group of the order complex of the Boolean lattice is nothing other than the (classical) fundamental group of the complement (over the real numbers) of the k-equal arrangement. In order to prove this result one is led to study the discrete fundamental group of the permutahedron. In a similar spirit, we study the discrete fundamental group of the type-A associahedron. In particular we show that this is a free group on (n+2) choose 4 generators. We believe that this notion of discrete homotopy will shed a new light on the study of polytopes, in particular on type-B (and other) associahedra. (Received August 06, 2007)