1158-05-276   **Helene Barcelo*** (`hbarcelo@msri.org`), MSRI, Berkeley, CA 94720, and **Curtis Greene**, **Abdul Jarrah** and **Volkmar Welker**. *On the vanishing of the discrete singular cubical homology for graphs.*

In the early 2000, a discrete notion of homotopy for graphs and simplicial complexes was developed. The motivation came from the desire to find invariants for dynamic processes that could be encoded via (combinatorial) simplicial complexes. The invariants are topological in nature, while also sensitive to the combinatorics encoded in the complex, in particular the level of connectivity of simplices. The ensuing discrete homotopy groups differ from the classical homotopy groups in significant ways that will be reviewed in this talk. In the early 2010, the associated notion of discrete (singular cubical) homology was developed.

In this talk we show that if a graph G has no 3-cycles and 4-cycles, then the discrete cubical homology group of G is trivial in dimension d, for all $d \geq 2$. We also provide a sequence $\{G_d\}$ of graphs such that the homology is non-trivial in dimension d for $d \geq 1$. (Received March 02, 2020)