1163-55-1030   **Ellen Gasparovic**, **Maria Gommel**, **Emilie Purvine*** (`emilie.purvine@pnnl.gov`), **Radmila Sazdanovic**, **Bei Wang**, **Yusu Wang** and **Lori Ziegelmeier**. *Homology of Graphs and Hypergraphs.* Preliminary report.

Graphs and hypergraphs are typically studied from a combinatorial perspective. A graph being a collection of vertices and pairwise relationships (edges) among the vertices, and a hypergraph capturing multi-way or group-wise relationships (hyperedges) among the vertices. But both of these objects have topological structure in addition to their well-studied combinatorial aspects. Graphs, being inherently pairwise objects, can be considered either as a one dimensional simplicial complex or as a metric space using shortest path distance. Hypergraphs, on the other hand, capture group-wise interactions and thus do not have a simple pairwise metric space that captures the complex structure. While hypergraphs do have an associated simplicial complex, there are multiple hypergraphs consistent with the same simplicial complex. In this talk I will survey some recent results on the homology of both graphs and hypergraphs, including persistent homology of metric graphs and a variety of notions of homology for hypergraphs. (Received September 14, 2020)