

# An introduction to graph-associahedra

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## **Abstract**

The associahedron (or Stasheff polytope) is an object appearing in numerous areas of mathematics, from homotopy theory (operads), configuration spaces (particle collisions), statistics (phylogenetic trees), geometric group theory (Coxeter complexes), and combinatorics. Given any graph  $G$ , we construct a convex polytope based on  $G$  with some elegant properties. When  $G$  is a path, we obtain the associahedron; when  $G$  is a cycle, we obtain the cyclohedron. This polytope appears naturally with respect to simplicial Coxeter groups, and provides the tiling for generalizations of real moduli spaces of curves.