

Michigan Math Club

Thursday at 4pm in the Nesbitt Room
Free Pizza and Pop

The combinatorics of convex polytopes

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A convex polytope is the convex hull of a finite set of points in \mathbb{R}^d . Convex polytopes are fundamental geometric objects that have been investigated since antiquity. Euler's formula

$$V - E + F = 2$$

relates the number of vertices V , edges E , and facets F of a 3-dimensional polytope. This formula was extended to all d -dimensional polytopes by Poincaré as a consequence of his development of homology theory.

In this talk I will discuss some combinatorial properties of convex polytopes, mostly concerning the faces of polytopes and their relations, and give a simple proof of the Euler–Poincaré formula.

