

Stony Brook Math Club Student Talk:
Pachner Moves: How to Decompose Maps
Between Triangulated Spaces

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Date: Wednesday, May 1, 2019

Time: 7PM - 8PM

Location: Math Tower P-131

It is common throughout mathematics to want to determine when there is an isomorphism between two objects. If our objects have enough structure, we can often identify a set of "atomic" isomorphisms, such that any isomorphism is the composition of a sequence of atomic isomorphisms. For closed simplicial complexes, Pachner moves are the atomic isomorphisms. We will begin by rigorously defining a simplex, defining a simplicial complex, explaining what a homeomorphism between two simplicial complexes is, and giving examples of each concept. Next we will introduce the combinatorial definition of a simplicial complex, show that any combinatorially equivalent complexes are homeomorphic, and then give examples of complexes which are homeomorphic but combinatorially distinct. Finally, we will introduce the Pachner moves as a solution to finding homeomorphisms between combinatorially distinct simplicial complexes. We will explain dimension-general Pachner moves and provide examples in low dimensions. If time permits, I will present an animation which demonstrates the relationship between Pachner moves and the deformation of the convex hull of a finite set of points.