HASAN MAHMOOD, Dalhousie University
Mutation of Simplicial Complexes

When a brain processes some information at a certain time, this activity of the brain can be described as a simplicial complex whose vertices are the neurons. This simplicial complex will undergo a change for performing another activity depending on what information is being processed - and the process of changing one simplicial complex to another continues. Let us generalize this phenomenon. Let Δ be a simplicial complex on a finite vertex set V. In theory, there can be many ways of obtaining a simplicial complex from the given one. Let us fix one such way and call it $\mathcal{T}$, which transforms Δ into a new simplicial complex $\mathcal{T}(\Delta)$. Set $\Delta_k = \mathcal{T}(\Delta_{k-1})$ with setting $\Delta_0 = \Delta$. This way we obtain a sequence $\{\Delta_k \ : \ k \in \mathbb{N}\}$ of simplicial complexes. Let us call this sequence a mutation of Δ under $\mathcal{T}$. Since there can only be a finite number of simplicial complexes on V, this mutation would either stabilize, "vanish", or start repeating its terms (up to isomorphism) at some point. In my talk, I will talk about the stability of mutations of some simplicial complexes for a special $\mathcal{T}$ that returns us the Stanley-Reisner complex of the facet ideal for the input simplicial complex.