Department of Mathematics
University of Notre Dame

TOPOLOGY SEMINAR

Guest Speaker: Jay Shah
University of Notre Dame

Date: Tuesday, September 25, 2018
Time: 2:30 PM
Location: 258 Hurley Hall

Lecture Title:

Algorithmic canonical stratifications of simplicial complexes

Abstract

Talk I: 2:30-3:30 Talk II: 4:00-5:00 In this talk, I will introduce a new algorithm for computing the coarsest stratification of a finite abstract simplicial complex K such that the strata are homology manifolds. More precisely, given the poset P of simplices of K, we algorithmically determine a map of posets $\pi : P \to [\dim(P)]$ such that for each fiber $P_{\pi=i} \subset P$, $P_{\pi=i}$ is maximal among all open subposets $U \subset \overline{P_{\pi=i}}$ in its closure such that the restriction of the local $\mathbb{Z}$-homology sheaf of $\overline{P_{\pi=i}}$ to U is locally constant. Passage to the localization of P dictated by π then attaches a canonical stratified homotopy type to K, which is the ∞-category of exit paths with respect to this stratification. The main new idea is to iteratively constrain the stable homotopy types of the links of simplices via Poincaré duality. This is joint work with Ryo Asai.