ALEXEY GARBER, The University of Texas Rio Grande Valley
On spheres with k points inside

A classical result of Delone claims that for a finite and generic point set A in $\mathbb{R}^d$, every generic point in the convex hull of A belongs to exactly one simplex with empty circumsphere. The collection of all these simplices is called the Delaunay triangulation of A. In the talk I will discuss a generalization of Delaunay's result to the case of simplices with k points inside their circumspheres. I will also talk about possible extensions to the case of weighted points sets and point sets in $\mathbb{S}^d$, and sketch a new geometric proof for the fact that volumes of hypersimplices are Eulerian numbers. The talk is based on a joint work with Herbert Edelsbrunner and Morteza Saghafian.