Secant Defectvity of Toric Varieties

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The *h-secant variety* $\sec_h(X)$ of a non-degenerate n-dimensional variety $X \subset \mathbb{P}^N$ is the Zariski closure of the union of all linear spaces spanned by collections of h points of X. The *expected dimension* of $\sec_h(X)$ is $\text{expdim}(\sec_h(X)) := \min\{nh + h - 1, N\}$. The actual dimension of $\sec_h(X)$ may be smaller than the expected one. Let N be a rank n free abelian group and M its dual. Let $P \subseteq M_{\mathbb{Q}}$ be a full dimensional lattice polytope and X_P the corresponding toric variety.

In this talk we discuss a new technique to give bounds on the Secant Defectivity of X_P using information from the polytope P. It is a joint work with Antonio Laface and Alex Massarenti.