1041-14-57   **Brian Harbourne*** (`bharbour@math.unl.edu`), Department of Mathematics, University of Nebraska-Lincoln, Lincoln, NE 68588-0130. *Intersections of simplices with linear subspaces.* Preliminary report.

Problem 1 Let I be an ideal of points in $\mathbf{P}^n$ with generic Hilbert function. How big can the Hilbert function of the symbolic square $I^{(2)}$ be?

Problem 2 Let $I \subseteq k[\mathbf{P}^n]$ be any homogeneous ideal. Give a universal lower bound on m in terms of r such that $I^{(m)} \subseteq I^r$ holds.

Both problems lead to combinatorially interesting sets of points, obtained as intersections of codimension n skeleta of the N-simplex in $\mathbf{P}^N$ with a general linear subspace of dimension n. Recent work on these point sets by various people has led both to partial results on these problems and to additional results related to Hilbert functions, graded Betti numbers and Cox rings. I will discuss what is now known, and explain the evidence it lends in favor of the following conjecture regarding which symbolic powers of an ideal a given ordinary power contains.

Conjecture Let $c \geq 0$ be an integer. Then $I^{(nr-c)} \subseteq I^r$ holds for all homogeneous ideals $I \subseteq k[\mathbf{P}^n]$ and all integers $r \geq 1$ if and only if $c \leq n - 1$.