Partitioning on varieties and point-hypersurface incidences

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I will describe a new polynomial partitioning result applicable to finite sets of points in a variety of codimension at most 2. It generalizes the Guth-Katz polynomial partitioning theorem as well later generalizations of this result to sets of points in hypersurfaces.
This result opens up the possibility of proving new incidence bounds in higher dimensions, and we apply it to the problem of bounding incidences between points and hypersurfaces in 4-dimensional real space.

Joint work with Saugata Basu (Purdue University, USA).