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Hypersurface Sections of a Projective Variety.

Let X be a smooth irreducible projective variety of dimension at least 2 over an algebraically closed field k of characteristic 0 in the projective space $\mathbb{P}^n$. Bertini's Theorem states that a general hyperplane H intersects X with an irreducible smooth subvariety of X. However, the precise location of the smooth hyperplane section is not known. We consider the following question: Given q closed points on X and let V be the linear system of homogeneous polynomials of degree m vanishing at these points, then for what q, m and V, a general member of V as a hypersurface intersects X with an irreducible, smooth subvariety of codimension 1 on X? We will discuss this question in the talk and report our recent result. (Received April 07, 2010)