1064-13-103 **Stefan O Tohaneanu***, Department of Mathematics, Middlesex College, The University of Western Ontario, London, Ontario N6A 5B7, Canada. *Points, regularity, minimum distance.*

Given $\Gamma \subset \mathbb{P}^n$ a non-degenerate (reduced) set of $m$ points, finding $hyp(\Gamma)$, the maximum number of these points lying in a hyperplane is an interesting geometrical and computational question (e.g., Migliore-Peterson study the case of maximum number of points lying on a hypersurface of degree $d$), with an important impact in algebraic coding theory: $m - hyp(\Gamma)$ is the minimum distance of the code with generating matrix having as columns the coordinates of the points. Gold-Little-Schenck showed that if $\Gamma$ is a complete intersection, then $m - hyp(\Gamma) \geq r$, where $r$ is the regularity of $A = k[x_0, \ldots, x_n]/I(\Gamma)$. We extended this result to the case when $\Gamma$ is arithmetically Gorenstein, and in this talk we present the general case: for any $\Gamma \subset \mathbb{P}^n$ non-degenerate set of $m$ points, we have $m - hyp(\Gamma) \geq a(\Gamma) - n$, where $a(\Gamma)$ is the minimum shift in the last module in the minimal graded free resolution of $A$. Also, we present a class of examples (due to J. Migliore) for which the bound is attained. The tools used are: computation of Hilbert function of ideal of points, separators, Cayley-Bacharach Theorem, mapping cone and free resolutions. (Received September 01, 2010)