1077-05-1639 **James E Gossell*** (JEG84240@ucmo.edu), Mathematics and Computer Science, W. C. Morris 222, University of Central Missouri, Warrensburg, MO 64093, and **Peter Johnson**, Auburn University. *A Geometric Extremal Result for Cubic Arrays.*

Imagine a game in which your goal is to select as many points as you can from an $n \times n$ square lattice in $\mathbb{Z}^2$. There is just one rule: No three points in your selected set may form a right triangle. For $n \geq 2$ you will find that you can pick up to $2n-2$ points from the lattice without forming any right triangles. But try as you may, it is impossible to avoid forming a right triangle if you pick at least $2n-1$ points.

In this talk, we will examine a 3-dimensional variation to this game: How many points can you pick from an $n \times n \times n$ cubic lattice in $\mathbb{Z}^3$ without forming a right triangle in any plane parallel to one of the coordinate planes? We will give a tight bound on the maximum number of points one can pick without forming such a right triangle. Several similar, but unsolved problems will also be mentioned. (Received September 20, 2011)