

**Meeting:** 1002, Pittsburgh, Pennsylvania, SS 2A, Special Session on Convexity and Combinatorics

1002-52-52            **Noam Elkies, Lou M Pretorius and Konrad J Swanepoel\*** ([swanekj@unisa.ac.za](mailto:swanekj@unisa.ac.za)), School of Mathematical Sciences, PO Box 392, UNISA, 0003 So Africa. *Sylvester-Gallai Theorems for Complex Numbers and Quaternions.*

A Sylvester-Gallai (SG) configuration is a finite set  $S$  of points such that the line through any two points in  $S$  contains a third point of  $S$ . According to the Sylvester-Gallai Theorem, an SG configuration in real projective space must be collinear. A problem of Serre (1966) asks whether an SG configuration in a complex projective space must be coplanar. This was proved by Kelly (1986) using a deep inequality of Hirzebruch.

We give an elementary proof of this result, and then extend it to show that an SG configuration in projective space over the quaternions must be contained in a three-dimensional flat. (Received July 29, 2004)