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**Elizabeth McMahon\*** (mcmahone@lafayette.edu), **Jordan Awan**, **Claire Frechette** and **Yumi Li**. *A Substructure of Maximal Caps in  $AG(4, 3)$* . Preliminary report.

It is possible to partition  $AG(4, 3)$  into 4 disjoint maximal caps (each of size 20) plus a single point; this structure was found using the visualization provided by the card game SET<sup>®</sup>. Although all maximal caps in  $AG(4, 3)$  are affinely equivalent, the action of the affine group is not transitive on pairs of disjoint maximal caps. One consequence of this is that the partitions fall into two equivalence classes under that action. Demicaps, a new substructure of the maximal caps, aid in understanding the geometric structure of one of the two classes. (Received August 26, 2014)