On Flocks of Cones: A Revolution of Perspective

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Abstract

Flocks of quadratic cones in $PG(3, q)$ have been intensively studied due to their connections with translation planes, generalized quadrangles, $q$-clans, hyperovals and other geometric structures. Over the past several years we have been attempting to generalize the theory to the setting in which the quadratic cone is replaced by an arbitrary cone in $PG(3, q)$. A consequence of this generalization is that one is forced to change one’s point of view of the subject. With this new perspective light is shed on some of the old problems, and new problems and connections come into view.