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Robert D. Knight* (knightr@ohio.edu), 101 University Dr., Chillicothe, OH 45601. *A New Perspective on Laguerre Planes.*

Laguerre geometry originated in work by Edmond Laguerre in the late 1800s. Van der Waerden and Smid generalized this geometry by introducing a basic axiomatic system in 1935. Their system is intuitively connected to the representation of a Laguerre plane as an incidence geometry of “circles” and points in a plane. Much of the research into Laguerre planes since has utilized idiosyncrasies of this representation. This approach has been fruitful, but there is a tendency to neglect studying objects not easily visualized within this representation. For example, Laguerre planes contain at least two types of pencils of circles. A parabolic pencil of circles is a maximal set of mutually tangent circles and an elliptic pencil of circles is the set of all circles through two given points. Structures involving several such pencils of circles appear quite complex. We introduce a new axiom system for Laguerre planes that is logically equivalent to the original. This system is defined using a set of affine planes, the points and lines of these planes, and incidence properties between the planes. Parabolic and elliptic pencils of cycles from the old system become lines, making configurations of these objects easier to study. (Received September 16, 2014)