

# Hyperovals in Small Projective Planes

**Peter Vandendriessche**

Ghent University, Belgium

**Definition** *A hyperoval in a finite projective plane of order  $q$ , is a nonempty set  $\mathcal{K}$  such that every line intersects it in 0 or 2 points.*

Alternatively, it can be defined as a set of  $q + 2$  points, no three collinear. One can easily show that hyperovals exist if and only if  $q$  is even.

Hyperovals are arguably the most commonly studied substructure of projective planes and appear in many branches of finite combinatorics, particularly coding theory.

In this session we will discuss the state of the art regarding the classification of the hyperovals in small Desarguesian projective planes. Particular focus will be given to the technique that lead to a recent breakthrough in  $PG(2, 64)$ , where a full classification is now known [1].

[1] P. Vandendriessche, *Classification of the Hyperovals in  $PG(2, 64)$* , preprint.

---

Department of Mathematics (WE01), Krijgslaan 281, 9000 Gent, Belgium  
peter.vandendriessche@ugent.be