

## Large Arcs in Small Planes

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An arc of degree  $d$  in a projective plane is a set of  $n$  points with no more than  $d$  of them collinear. It is denoted as  $(n, d)$ -arc. Examples arise from algebraic curves of degree  $d$ . An important task is to determine for each value of  $d$  and  $q$  the largest value of  $n$  for which an  $(n, d)$ -arc exists. We are interested in studying large arcs of degree  $d$  in  $PG(2, q)$  for small  $q$ . A related problem is that of classifying arcs up to projective equivalence. The talk will survey some of the techniques which are used to classify arcs: complete searches with classification using poset classification; liftings of smaller arcs using techniques of Cook, Ball and others; isomorph classification using canonical forms; parallel computing. Interestingly, largest arcs do not always arise from curves of degree  $d$ , so it is of interest to build models for the known examples. Such models may lead to new constructions of arcs and perhaps to infinite families. We will consider specific problems from the plane  $PG(2, 11)$ , with a particular emphasis on arcs of degree 5.

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