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*Geometric constructions of small regular bipartite graphs of girth 6*

In this talk we exhibit some structures in the projective plane of order  $q$  which allow us to find  $q$ -regular balanced bipartite graphs of girth 6 and  $2(q^2 - 1)$  vertices and  $k$ -regular balanced bipartite digraph with  $2(qk - 2)$  vertices for all  $k \leq q - 1$ , where  $k$  is an integer and  $q$  is a prime power with  $3 \leq k \leq q - 1$ . These graphs have the smallest number of vertices known so far among the regular graphs with girth 6 and improve the recent results on this topic.

Joint work with Camino Balbuena, Universidad Politécnica de Cataluña, España.