

## Extremal Combinatorics and Finite Geometry

**A. Blokhuis**

*Eindhoven University of Technology*  
*Eindhoven, The Netherlands*

In 1998 and 2004 I gave two talks in Italy with the title 'Finite Geometries and Extremal Graph Theory'. The lattice of subsets of a set can be seen as the thin case of the lattice of subspaces of a vector space. As a consequence it is natural to try to formulate the classical problems in extremal set theory as geometrical problems in (finite) projective spaces.

In the present talk I will discuss some recent results and mainly open problems belonging to extremal combinatorics and finite geometry. A special case of interest is the determination of the chromatic number of the graph on the  $k$ -dimensional subspaces of  $V(2k, q)$  where two subspaces are adjacent if they are disjoint. A related, difficult question is the determination of the maximal cliques in this graph. (Joint work with Andries Brouwer and Tim Mussche.)