Abstract

Existence and colouring of configurations

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Configurations are linear regular uniform hypergraphs. In the language of designs they are "Steiner systems where two different points may be not connected". Configurations were defined already in 1876.

A configuration (v_r, b_k) is a finite incidence structure of v points and b lines such that each line consists of k points, there are r lines through each point, and two different points are connected by at most one line.

In this talk the focus will be on existence and colouring problems. For a given set of parameters v, r, b, k the question is: Is there a configuration (v_r, b_k) ? If yes, how many non-isomorphic are there ? Colouring a configuration means to colour the points with a certain set of colours such that certain requirements for the lines are fulfilled. For instance, no line should be monochromatic or polychromatic. Or each line should follow a certain colour pattern.