VCU Discrete Mathematics Seminar

Constructions of difference sets in groups of order 4^d

Prof Jonathan Jedwab
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Wednesday, Feb. 23
1:00-1:50 EST

In person! in 4145 Harris Hall, and Zoom @
`https://vcu.zoom.us/j/92975799914`
`password=graphs2357`

The study of difference sets lies at the intersection of design theory, coding theory, finite geometry, and algebraic number theory. The central problem is to determine which groups contain at least one difference set, and the richest existence results occur when the group order is a power of 4. The principal obstacles are that the number of such groups grows rapidly, and that the groups have such diverse structures that an overall theory seems out of reach.

However, after a ten-year collaboration, this question was resolved completely for all 56,092 groups of order 256 using a new theoretical framework together with computational search. I shall describe the history of this problem, the methods used to resolve order 256, and the prospects for extending these techniques to order 1024.

For the DM seminar schedule, see:

`https://go.vcu.edu/discrete`