

Combinatorics Seminar

**Robert Bailey
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**Thursday, January 30, 2030
SN-4040, 11am-12pm**

***Some distance-regular graphs on 486 vertices: a story
in graphs, designs, codes and groups***

Abstract:

A graph is *distance-regular* if, for any i and any vertices u, v at distance i , the number of neighbours of v at distance $i-1$, i or $i+1$ from u depends only on i and not on the choice of vertices. We will consider some very special examples of distance-regular graphs on 486 vertices, arising from a particular permutation representation of the group $3^5 : (2 \times M_{10})$, and some previously-unobserved connections between them. Explaining the connection involves a combinatorial design arising from affine geometry, and the ternary Golay code.

This is joint work with Daniel Hawtin (Rijeka).