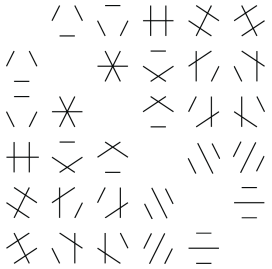
# Mathematics Seminar



## Rocky Mountain Algebraic Combinatorics Seminar

### Cubic surfaces over $\mathbb{F}_{13}$

Fatma Karaoglu
University of Sussex (UK)

Given five skew lines $a_1, a_2, a_3, a_4, a_5$ with a single transversal $b_6$ such that each set of four $a_i$ omitting $a_j$ $(j = 1, \ldots, 5)$ has a unique further transversal $b_j$, then the five lines $b_1, b_2, b_3, b_4, b_5$ also have a transversal $a_6$. These twelve lines form a double-six. The double six lies on a unique cubic surface with 15 further lines $c_{ij}$ given by $[a_i, b_j] \cap [a_j, b_i]$.

Hirschfeld in 1964 discussed the existence and the properties of the cubic surfaces over the finite fields of odd and even order and classified over $\mathbb{F}_4$, $\mathbb{F}_7$, $\mathbb{F}_8$, and $\mathbb{F}_9$. Sadeh in 1985 classified the cubic surfaces in $PG(3, 11)$. In this talk, we classify cubic surfaces with twenty-seven lines over the finite field of thirteen elements by classifying 6-arcs not lying on a conic in the plane, although projectively distinct arcs do not necessarily represent projectively distinct surfaces.

### Covers of Symplectic Dual Polar Spaces

Eric Moorhouse
University of Wyoming

For $q \equiv 1 \bmod 4$, the symplectic dual polar graph of type $G = Sp(2n, q)$ admits a double cover admitting $2 \times G$ as a group of automorphisms (M. and Williford, 2015). I will describe how this construction works over the field of real numbers (and possibly also mentioning more general fields). Here the group $2 \times G$ is replaced by the relevant metaplectic group, an extension of $Sp(2n, F)$ which is not necessarily split. Here, as in our original finite case, the Maslov index plays a crucial role.

Weber 223
4–6 pm
Friday, February 17, 2017
(Refreshments in Weber 117, 3:30–4 pm)
Colorado State University

This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.

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