Algebra and Number Theory Seminar

Title: Finite group actions on vector space spreads

Speaker: Rod Gow (UCD)

Date: Thu 26th September 2019 at 2:00PM

Location: Seminar Room SCN 1.25

Abstract: Let q be a power of a prime and let V be a vector space of even dimension $2m$ over the finite field of order q. Let f be a non-degenerate alternating bilinear form defined on $V \times V$. The group of all isometries of f is the symplectic group $Sp(2m, q)$. A (complete) symplectic spread of V is a set Ω of m-dimensional subspaces of V that are totally isotropic with respect to f and have the property that any two different elements of Ω have trivial intersection and each vector in V is in some element of Ω. Clearly, $|\Omega| = q^m + 1$.

Given a symplectic spread Ω, we are interested in those subgroups of $Sp(2m, q)$ that map Ω into itself. We are especially interested in such subgroups that additionally act transitively on the elements of Ω. We will outline how, in many cases, few subgroups have this property and that they essentially arise in the same way.

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