Robert Wilson: The Suzuki groups

The Suzuki groups form one of the 17 families of non-abelian finite simple groups. They can be defined in various ways as groups of 4×4 matrices over finite fields of order $q = 2^{2n+1}$, for $n > 0$.

The best description of a group is usually as the automorphism group of some object. Most descriptions of the Suzuki groups involve a *geometrical* object called an *ovoid*, which consists of $q^2 + 1$ subspaces of dimension 1 in a 4-dimensional space, with the property that any three of them span a 3-dimensional subspace. However, constructing these ovoids usually involves some kind of 'magic' (such as pulling them out of a hat, like rabbits).

In this talk I shall describe a new family of *algebraic* objects, whose automorphism groups are the Suzuki groups, and which give rise to the Suzuki ovoids in a natural manner. Thus we obtain a new and elementary definition (and description) of the Suzuki groups. Very little actual group theory is involved, just a little linear algebra.