Peter Cameron: *From orthogonal arrays to Schur's Theorem*

Schur's Theorem says that, if we colour the natural numbers with finitely many colours, then there is a solution to the equation $x + y = z$ for which all of $x, y, z$ have the same colour. A version of Schur's Theorem holds for the integers mod $n$ (where $n$ is sufficiently large compared to the number of colours), and even for general groups.

It turns out that, if we only use two colours, then the number of monochromatic solutions of Schur's equation in a finite group of order $n$ is bounded below by a function of $n$, independent of the group and the colouring. The proof is very simple and combinatorial, and works much more generally in structures called *orthogonal arrays*. This allows us to give easier proofs of several results in the literature.

This is joint work with Javier Cilleruelo and Oriol Serra.