

## Partitions and compositions over finite fields

Qiang Wang, Carleton University, Ottawa, Canada

In this talk we obtain an exact formula for the number of partitions of an element  $z$  into  $m$  parts over a finite field, i.e. we find the number of nonzero solutions of the equation  $x_1 + x_2 + \cdots + x_m = z$  over a finite field when the order of terms does not matter. This is equivalent to counting the number of  $m$ -multi-subsets whose sum is  $z$ . When the order of the terms in a solution does matter, such a solution is called a composition of  $z$ . We also obtain an formula for the number of compositions, which is useful in the study of zeta functions of toric hypersurfaces over finite fields. Finally we comment on some extensions and applications of our results.

Keywords: finite fields, sumset, partition, composition