

Exponential sums over finite fields

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Exponential sums are among the simplest mathematical objects that one can imagine, but also among the most remarkably useful and versatile in number theory.

This talk will survey the history, the mysteries and the surprises of such sums over finite fields, with a focus on questions related to the distribution of values of families of exponential sums. General principles and applications will be illustrated by concrete examples, where sums of two squares, Sidon sets, Larsen's Alternative, the variance of arithmetic functions over function fields and the lines on cubic threefolds will make appearances.

(Based on joint work with A. Forey and J. Fresán)