Abstract:

In this talk we discuss various kinds of Kloosterman sums (or integrals). The identities can be viewed as a vast generalization of the following classical identity. Let k be a finite field, k' its quadratic extension, $\psi : k \to \mathbf{C}^\times$ a non trivial character. Then, for $c \in k^\times$,

$$\sum_{\substack{x_1, x_2 \in k \\ x_1 x_2 = c}} \psi(x_1 + x_2) = -\sum_{\substack{x \in k' \\ \bar{x}x = c}} \psi(x + \bar{x}).$$

The identities can be used to investigate integrals of automorphic forms over certain subgroups. In turn, these integrals are related to special values of L-functions.