Department of Mathematics and Computer Science

Thursday, April 8, 2021, 4:00 pm

COLLOQUIUM TALK

Speaker: Liem Nguyen (Louisiana State University)

Zoom Meeting (ID: 91520924644)

Weil sum, Helleseth Conjectures, and Applications

Abstract:

The Weil sum of an additive character μ over a finite field F is defined to be $W_{F,s}(a) = \sum_{x \in F} \mu(x^s - ax)$ where s is an integer coprime to $|F^*|$. The Weil spectrum counts distinct values of the Weil sum as a runs through the invertible elements in the finite field. Determining the values of these sums and the size of its spectrum give answers to long-standing problems in communcation netwroks, coding and information theory. In this talk, we prove a special case of the Vanishing Conjecture of Helleseth (1971) on the presence of zero in the Weil spectrum. We then propose a new conjecture on when the Weil spectrum contains at least five elements, and prove it for a certain class of Weil sum.