

Title: The Weil Height of the Centralizer of Complex Conjugation

Abstract: We develop the optimal abstraction of a well known inequality due A. Schinzel concerning the Weil height of totally real algebraic numbers. Our new result allows for consideration of arbitrary algebraic numbers having a real Galois conjugate. As a consequence, we can associate a lower bound for the Weil height of an algebraic number based on the index of the centralizer of complex conjugation in the Galois group of the Galois closure of the number. This interpretation is an abstraction of a result due to F. Amoroso and R. Dvornicich. We will discuss recent and related results due to other authors and new research questions that have come to our attention.

Time permitting we will discuss some recent progress of ours concerning Lehmer's problem. In particular we will review our discovery that amongst all polynomials in $\mathbb{Z}[x]$ whose splitting fields are contained in dihedral Galois extensions of \mathbb{Q} , the lowest Mahler measure (other than 1) is uniquely obtained by $\pm(x^3 - x - 1)$. This new result raises promising research questions which we hope to discuss.