

Title: Exploring the Hodge conjecture

Abstract: We will give brief background and explanation of this famous conjecture in algebraic geometry. We will follow this with an outline of some recent work on the theory of normal functions as a fundamental tool for studying the Hodge problem of characterizing algebraic cycles cohomologically.

The subject of normal functions, pioneered by Phillip Griffiths, has received considerable recent attention. Of particular current interest is the study of obstructions to extensions of normal functions over complete linear systems of sufficiently ample divisors, following progress by Green-Griffiths on singularities of normal functions, and by Brosnan-Pearlstein et al in the context of Saito's mixed Hodge modules.