1049-05-35 **Alan Michael Stapledon*** (astapldn@umich.edu), Department of Mathematics, 2074 East Hall, 530 Church St, Ann Arbor, MI 4804. *Weighted Ehrhart Theory.*

In Ehrhart theory, one studies the number of lattice points in any dilation of a lattice polytope P. In this talk, we present a refinement of this theory in which every lattice point v is counted with a particular weight w(v), determined by the smallest rational number m such that v lies in mP. We will show how this leads to simple proofs and generalizations of some classical results of Ehrhart and Hibi. Secondly, we will explain the geometric motivation for this approach. More specifically, we will discuss the correspondence with orbifold Betti numbers of toric stacks. (Received February 04, 2009)