1014-11-697 **Matthew Baker** (mbaker@math.gatech.edu), School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332-0160, and **Clayton Petsche*** (clayton@math.uga.edu), Department of Mathematics, The University of Georgia, Athens, GA 30602-7403. *Global Discrepancy and Small Points on Elliptic Curves.*

Let E be an elliptic curve defined over a number field k. We define the "global discrepancy" of a finite set $Z \subset E(\bar{k})$ which in a precise sense measures how far the set is from being adelically equidistributed. We prove an upper bound for the global discrepancy of Z in terms of the average canonical height of points in Z. We deduce from this inequality a number of consequences. For example, we give a new and simple proof of the Szpiro-Ullmo-Zhang equidistribution theorem for elliptic curves. We also prove a non-archimedean version of the Szpiro-Ullmo-Zhang theorem which takes place on the Berkovich analytic space associated to E. We then prove some quantitative 'non-equidistribution' theorems for totally real or totally p-adic small points. The results for totally real points imply similar bounds for points defined over the maximal cyclotomic extension of a totally real field. (Received September 22, 2005)