Mike Roth

Title: Roth's theorem for arbitrary varieties, and other Diophantine applications of local positivity

Abstract: If X is a variety of general type defined over a number field k, then the Bombieri-Lang conjecture predicts that the k-rational points of X are not Zariski dense. The conjecture is a prediction that a global condition on the canonical bundle (that it is "generically positive") implies a global condition about rational points. By the local-global philosophy in geometry we should look for local influence of positivity on the accumulation of rational points. To do that we need measures of both these local phenomena. Let L be an ample line bundle on X, and $x \in X(\overline{k})$. The central theme of the talk is the interrelations between $\alpha_x(L)$, an invariant measuring the accumulation of rational points around x as gauged by L, and the Seshadri constant $\epsilon_x(L)$, measuring the local positivity of L near x. In particular, the classic approximation theorem of K.F. Roth on $\mathbf{P}^1$ generalizes as an inequality between α_x and ϵ_x valid for all projective varieties. The talk will also discuss generalizations of these results to approximation higher dimensional subvarieties. This is joint work with David McKinnon.