

**Meeting:** 1004, Bowling Green, Kentucky, SS 15A, Special Session on Recent Advances in Noncommutative Algebra

1004-16-30            **Jason Pierre Bell\*** ([belljp@umich.edu](mailto:belljp@umich.edu)), Department of Mathematics, University of Michigan, East Hall 525 E. University Avenue, Ann Arbor, MI 48109. *Automorphisms of affine  $n$ -space and critical density.*

We look at the following problem. Let  $X$  be a quasi-projective variety with an automorphism  $\sigma$ . Given a point  $x \in X$  and a subvariety  $Y \subseteq X$  for which integers  $n$  do we have  $\sigma^n(x) \in Y$ ? In characteristic  $p > 0$  the set of such  $n$  can be quite complicated, but in characteristic 0 it seems that the set of such  $n$  must be a the union of a finite set and a finite union of complete doubly infinite arithmetic progressions. We show how  $p$ -adic methods can be used to prove this when  $X$  is affine  $n$ -space and when  $X$  is a Fano variety as well as some other cases. Moreover we show how this result is a generalization of a theorem of Skolem, Mahler and Lech about rational functions. This research was motivated by a question of Daniel Rogalski. (Received January 02, 2005)