

# Algebraic dynamics, difference fields and model theory

**Abstract:** M. Baker proved in 2007 that given an endomorphism  $f$  of  $\mathbf{P}^1$  of degree  $> 1$  and defined over a function field  $K$ , either all points of  $\mathbf{P}^1(K)$  of canonical height 0 are preperiodic, or the endomorphism  $f$  descends to the field of constants of  $K$ . L. Szpiro and T. Tucker asked about generalising the result to higher dimensional varieties. A reformulation by L. Szpiro of the hypotheses in terms of limited sets allowed model theory to get into the picture, more precisely the model theory of difference fields. We were therefore able to give the correct formulation of the descent result in higher dimension, and prove it.

This is what I will explain in the talk: connections between algebraic dynamics and difference fields; translation of the problem; how model theory of difference fields intervenes. (Joint work with E. Hrushovski).