Beautiful pairs of valued difference fields

Martin Hils

In their seminal work on the model theory of the Witt-Frobenius automorphism, published 20 years ago, Bélair, Macintyre and Scanlon study valued fields endowed with an isometric automorphism that satisfy an appropriate version of henselianity. This work, along with the parallel one by Hrushovski (continued by Azgin and others) on the contractive case, boosted the model theoretic study of valued fields with a distinguished automorphism, in particular in case it equals the non-standard Frobenius or Witt-Frobenius.

In the talk, I will first give a short overview of some older results obtained in this setting in the last 15 years, including model-theoretic tameness properties and the classification of imaginaries. I will then report on ongoing work (joint with Hrushovski, Ye and Zou) on so-called beautiful pairs of valued difference fields, which provides strict pro-definable spaces that are model-theoretic analogs - in the difference setting - of various kinds of non-archimedean analytifcations of algebraic varieties over a valued field (Berkovich, Huber, and Zariski-Riemann spaces, respectively).