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Arboreal Galois Representations of Dynamical Belyi Maps.

A dynamical Belyi map is a finite morphism $f : \mathbb{P}_{\mathbb{C}}^1 \rightarrow \mathbb{P}_{\mathbb{C}}^1$ defined over \mathbb{C} which is branched exactly at the three ordered points $0, 1, \infty$ such that $f(\{0, 1, \infty\}) \subseteq \{0, 1, \infty\}$ which makes all the iterates f^n also Belyi maps. Given a dynamical Belyi map defined over a number field K and a non-preperiodic point $\alpha \in K$, one can construct a tree of preimages of α . This construction leads to the phenomena: one has a tower of fields $K = K_0 \subseteq K_1 \subseteq K_2 \subseteq \dots$ where $K_n := K(\phi^{-n}(\alpha))$. One also has a natural Galois representation on the tree of preimages, the so-called Arboreal Galois representation of the function f . In this talk, we describe the Arboreal Galois representations and the monodromy groups of iterations of a large class of dynamical Belyi maps. Studying these Galois groups has applications in the study of the density of prime divisors of elements of dynamical sequences. If time allows, I will mention some applications as well. (Received January 20, 2020)