# The Critical Locus of a Dynamical System

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**Abstract**

In 1D, critical points (the places where the derivative vanishes) play an essential role in the dynamics of polynomial Julia sets. In 2D, polynomial automorphisms of $\mathbb{C}^2$ are a prototype of chaotic dynamical systems with complicated Julia sets. A polynomial automorphism does not have critical points in the usual sense, but it has a non-empty critical locus (i.e. the set of tangencies between the foliations of the sets of points which escape to infinity under forward and respectively backward iterations), which we analyze in a broad context, outlining recent progress in the field. This is based on joint work with Tanya Firsova and Remus Radu.