Singular perturbations in the quadratic family

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In recent years, families of complex rational maps that result from perturbing well known quadratic maps such as $Q_0(z) = z^2$ and $Q_c(z) = z^n + c$, where c is the center of the corresponding Multibrot set, have been of interest. In this presentation, we consider maps of the form $P_c(z) = z^2 + c$, where c is the center of a hyperbolic component of the Mandelbrot set, that have been perturbed by the addition of a pole or multiple poles which affect the superattracting cycle of the unperturbed map. We will focus on the topological and dynamical characteristics of the resulting Julia sets. In particular, we will give conditions which guarantee that the corresponding Julia set contains homeomorphic copies of the unperturbed Julia set, Cantor sets of quasicircles, and Cantor sets of point components that accumulate on these curves.