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Siegel disks of cubic polynomials

Given λ in the unit disk, we consider the family of cubic polynomials $P_{\lambda,a}(z) = \lambda(z + az^2 + z^3)$. There is a unique power series $\phi_{\lambda,a}(z) = z + o(z)$ such that $\phi_{\lambda,a}(\lambda z) = P_{\lambda,a}\big(\phi_{\lambda,a}(z)\big)$. We let $r_\lambda(a)$ be the radius of convergence of the series $\phi_{\lambda,a}$. The function $u_\lambda = -\log r_\lambda$ is continuous and subharmonic. We study the behavior of the functions u_λ and the measures $\mu_\lambda := \Delta u_\lambda$ as $|\lambda| \to 1$.

Joint work with Arnaud Chéritat and Carsten Petersen.