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Teapots and entropy algorithms for the Mandelbrot set

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Thurston's "Master Teapot" is a three-dimensional fractal-like object that captures how topological entropy varies for real quadratic polynomials. In joint work with Chenxi Wu and Giulio Tiozzo, we constructed an analogous "teapot" for each principal vein of the Mandelbrot set, extending key geometric properties from the real setting to the complex plane. Specifically, we showed that eigenvalues outside the unit circle change continuously with external angle, while those within the unit circle exhibit "persistence" along principal veins. To establish these results, we developed a version of kneading theory adapted to principal veins and proved the equivalence of multiple core entropy algorithms. In this talk, I will discuss this circle of ideas, emphasizing how entropy provides a lens on the geometry of the Mandelbrot set.

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