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Critical Portraits, Sibling Portraits, the Central Strip, and Never Close Sides of Polygons in Laminations

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Abstract: Laminations of the unit disk were introduced by William Thurston as a topological/combinatorial vehicle for understanding the (connected) Julia sets of polynomials, and, in particular, the parameter space of quadratic polynomials. Though the problem that Thurston was interested in has not been solved, the local connectedness of the Mandelbrot set (the analytic parameter space of quadratic polynomials), his excursion into laminations eventually gave birth to laminations as a way of understanding higher degree polynomials and their corresponding laminations. Much work has been done for cubic polynomials and their parameter spaces (analytic and laminational). In this talk we will decribe some work in progress on understanding phenomena that can occur with laminations, and consequently with Julia sets (maybe), of higher degree, $d \geq 3$. In particular, we are interested in laminational phenomena that cannot occur for $d = 2$, but can occur for $d = 3$, cannot occur for $d \leq 3$, but can occur for $d = 4$, and so on. The topics mentioned in the title are on the route of discovery.