

Michael Dobbins (Binghamton)

When Conformal Maps Get Squished

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A map is called conformal when it preserves angles. Consider a sequence of simple closed curves C_t in the plane that get squished to a path. That is, C_t consists of a pair of curves E_t and W_t that converge to the same curve in Fréchet distance. By the Riemann Mapping Theorem, there is a conformal map from the interior of C_t to the upper half-plane. Preserving angles comes at the cost of distorting scale, and as C_t gets squished, this map becomes highly distorted. I will show in this talk that, for appropriate choice of conformal map, the image of any arbitrarily small neighborhood of a single point covers the entire upper half-plane in the limit.

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