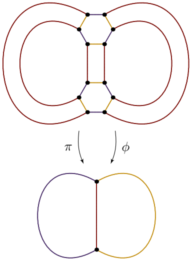
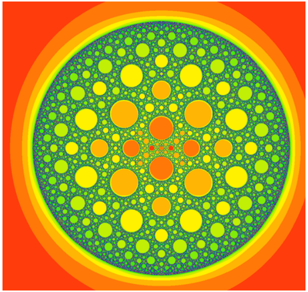
Studying Rational Maps via Graphs

Dylan Thurston, Organizer, Complex Dynamics

Indiana University





$$f(z) = \frac{4}{27}\frac{(z^2 - z + 1)^3}{(z(z-1))^2}$$

$$E^p(\phi) = \sup_y \Big(\sum_{x \in \phi^{-1}(y)} |\phi'(x)|^{p-1} \Big)^{1/p}$$

$$\overline{E}^p = \lim_{n \to \infty} E^p(\phi^n)^{1/n}$$

Parts joint with J. Kahn, K. Pilgrim

January 31, 2022

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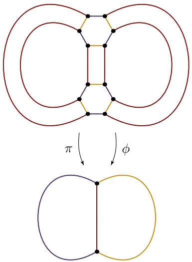

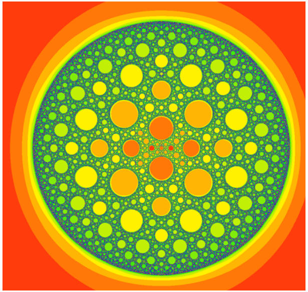

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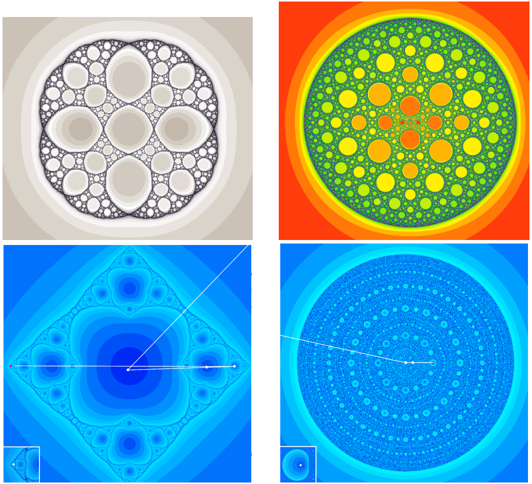
- $\overline{E}^p$ non-increasing as fcn of p
- $\overline{E}^2 < 1 \Leftrightarrow f$ is rational
- $\overline{E}^p = 1 \Leftrightarrow^{(*)} p$ is Ahlfors-regular conformal dimension of Julia set

Challenges:

- Convexity of $\overline{E}^p$
- Define energy for map on Julia set



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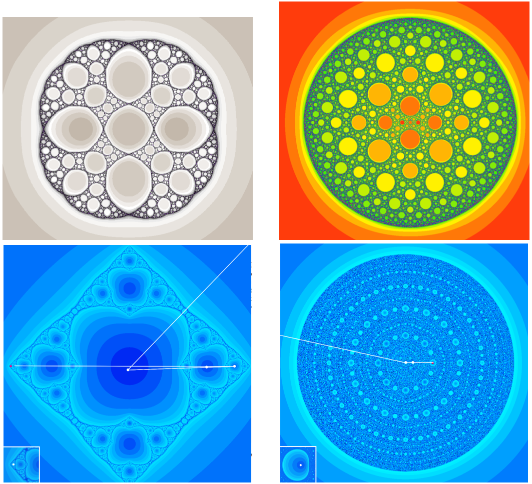

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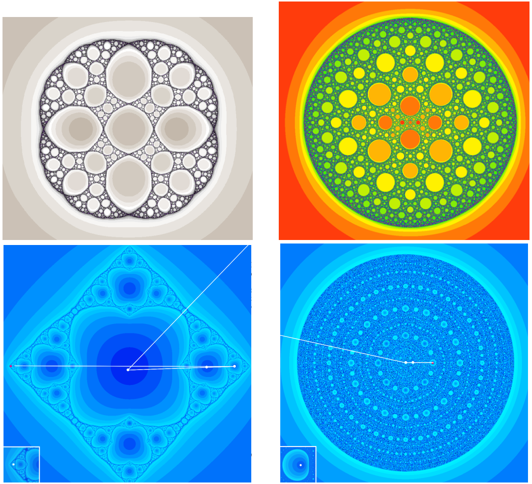

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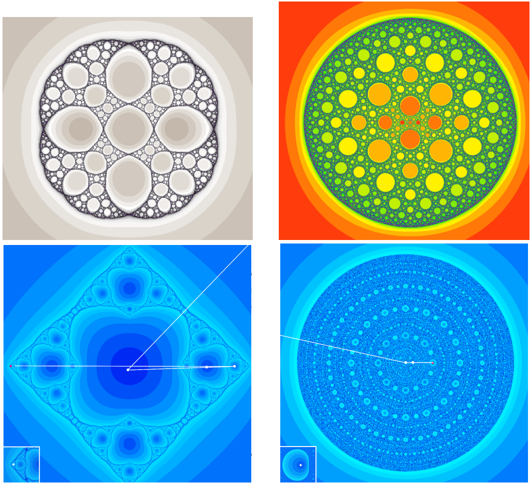

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