

Prescribing the Postsingular Dynamics of Meromorphic Functions

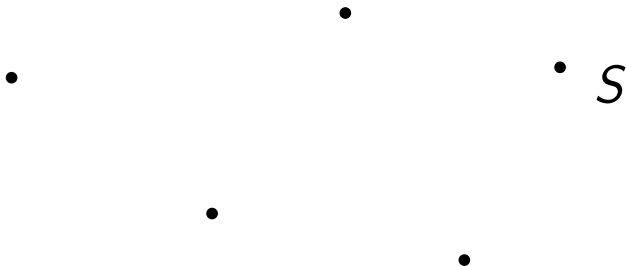
Kirill Lazebnik¹ (joint work with Christopher J. Bishop²)

1. Caltech
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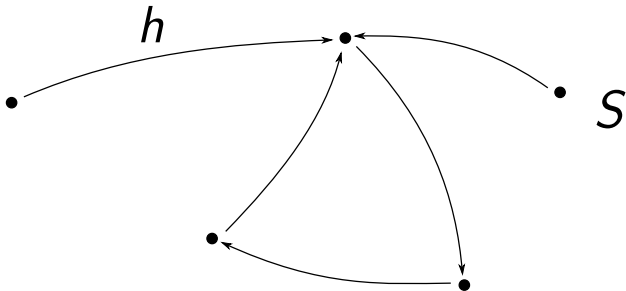
CAFT 2018

Theorem: (DeMarco, Koch, McMullen [DKM17]) *Let $h : S \rightarrow S$ be an arbitrary map defined on a finite set $S \subset \hat{\mathbb{C}}$ with $|S| \geq 3$. Then there exists a sequence of rigid postcritically finite rational maps f_n such that $|P(f_n)| = |S|$, $P(f_n) \rightarrow S$ and $f_n|_{P(f_n)} \rightarrow h|_S$ as $n \rightarrow \infty$.*

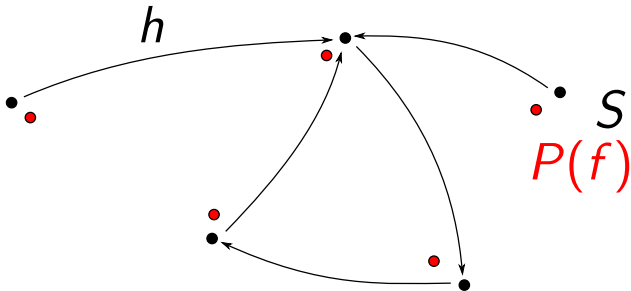
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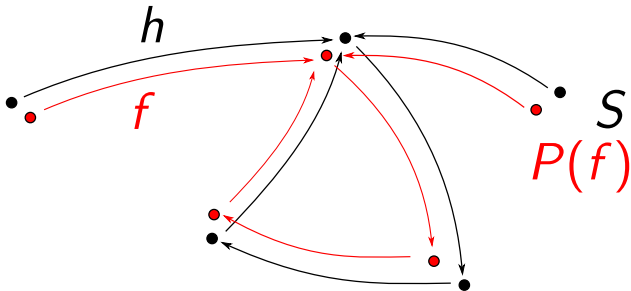
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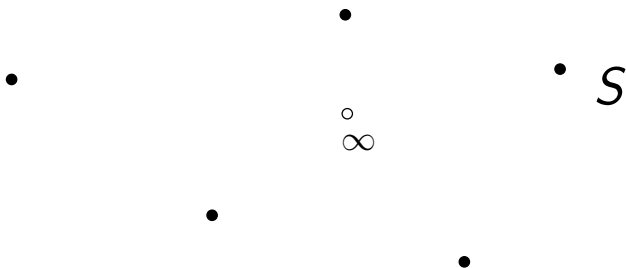


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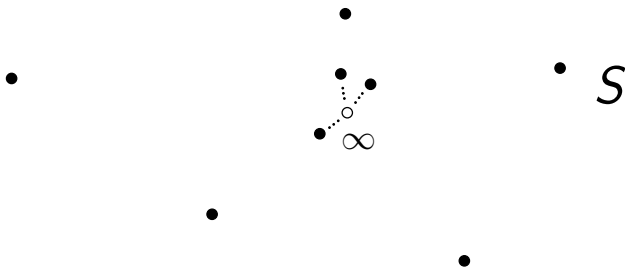


Theorem: (Bishop, L.') Let $S \subset \mathbb{C}$ be a discrete sequence (no finite accumulation points) with $4 \leq |S| \leq \infty$, let $h : S \rightarrow S$ be any map, and let $\varepsilon > 0$. Then there exists a transcendental meromorphic function $f : \mathbb{C} \rightarrow \widehat{\mathbb{C}}$ and a bijection $\psi : S \rightarrow P(f)$ with $|\psi(s) - s| \rightarrow 0$ as $s \rightarrow \infty$, $|\psi(s) - s| \leq \varepsilon$ for all $s \in S$, and $f|_{P(f)} = \psi \circ h \circ \psi^{-1}$.

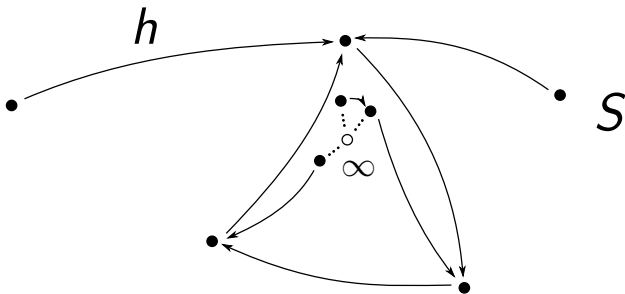
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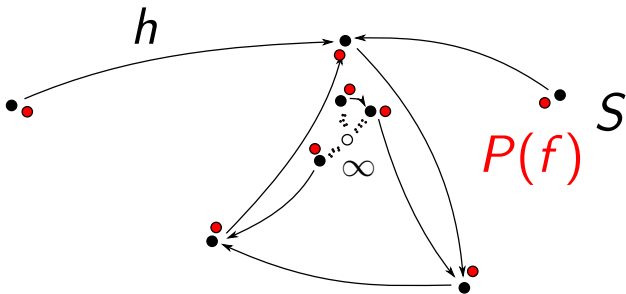
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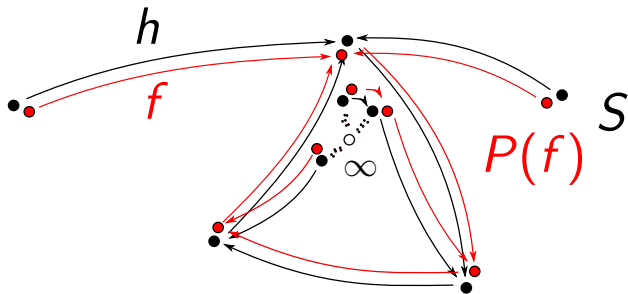
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Christopher J. Bishop.

Constructing entire functions by quasiconformal folding.

Acta Math., 214(1):1–60, 2015.



L. G. DeMarco, S. C. Koch, and C. T. McMullen.

On the postcritical set of a rational map.

ArXiv e-prints, September 2017.



A. Tychonoff.

Ein Fixpunktsatz.

Math. Ann., 111(1):767–776, 1935.

Question: Given any discrete planar sequence S and some map $h : S \rightarrow S$, does there always exist a meromorphic f so that $P(f) = S$, and $f|_S = h$?