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Constructive approximation by Julia sets

The study of possible shapes of polynomial Julia sets was instigated by Kathryn Lindsey, who proved that any Jordan curve in the plane can be approximated by polynomial Julia sets arbitrarily well in the Hausdorff distance, thereby answering a question of Bill Thurston. In this talk, I will present a constructive proof based on potential theory that any bounded subset of the plane whose interior has connected complement can be approximated in a strong sense by polynomial filled Julia sets. Several illustrative examples will be presented, as well as estimates for the rate of approximation in terms of geometric and potential theoretic quantities. This is joint work with Kathryn Lindsey.