

Douady, A.; Hubbard, J. H.

Étude dynamique des polynômes complexes. (French) Zbl 0552.30018

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These notes expound some of the results announced by the authors [C. R. Acad. Sci., Paris, Sér. I 294, 123-125 (1982; [Zbl 0483.30014](#))] and sketched by the first author in Sémin. Bourbaki, 35e année, Vol. 1980/81, Exp. No.599, Astérisque 105/106, 39-63 (1983; [Zbl 0532.30019](#)). They deal with the iterates f^n of $f : z \rightarrow z^2 + c$, where c is a complex parameter, the filled in Julia set $K(c) = \{z; f^n(z) \text{ is bounded}\}$, the Mandelbrojt set (which is connected): $M = \{c; f^n(0) \text{ is bounded}\}$, and $M_1 = \{c; f \text{ has an attractive cycle of some order}\}$. Two outstanding conjectures state that I: M is locally connected, II: $\overset{\circ}{M} = M_1$. In this and the second part the author proposes to show that I implies II. Much of the exposition is devoted to the Hubbard tree, a combinatorial scheme which can be constructed in $K(c)$ in the cases when 0 is either a periodic point or the preimage of a periodic point of f .

Reviewer: I.N.Baker

MSC:

- [30D05](#) Functional equations in the complex plane, iteration and composition of analytic functions of one complex variable
- [37G99](#) Local and nonlocal bifurcation theory for dynamical systems

Cited in **11** Reviews
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Keywords:

[Julia set](#); [Mandelbrojt set](#); [Hubbard tree](#)