ANNALES
DE LA FACULTÉ
DES SCIENCES
DE
TOULOUSE
Mathématiques

MARY REES

Préface

Tome XXI, nº S5 (2012), p. i-i.

<http://afst.cedram.org/item?id=AFST_2012_6_21_S5_r1_0>

Préface

I first heard about mating of polynomials in 1983, and since it was Adrien Douady who used the term, I took it to be a joke, or mostly so. But not many jokes keep their punch for thirty years. Interestingly, I can find no published reference before Douady's ICM article in 1986. But by that time, the research groups of both Douady and Hubbard were engrossed by this intriguing but problematic outgrowth of the groundbreaking discovery of the structure of the Mandelbrot set. It is intriguing, because surely the beautiful, intricate, but natural description of dynamics in the Mandelbrot set of polynomials must translate into the larger parameter space. Of course it does, and some of it we know, but it is the problems that have kept all of us going. Over the last thirty years, as this volume shows, the concept has permeated complex dynamics, has formed an alliance with the theory of Kleinian groups, where the concept is of at least equal importance, has motivated developments, as in iterated monodromy groups, and has attracted researchers younger than the concept itself.

So what are the problems? On a basic level, there are the twin problems of realisation of the topological mating structure in parameter space, and of what is essentially its reverse: recognition of a map in parameter space: what is described in one article as the constructive or descriptive approach. Probably examples are the key. Matings are relatively easy to produce. So if we want to check out a theory, we reach for a mating. Matings provided the first main application of Thurston's Theorem, and have provided, and continue to provide, many important examples. But the links between example and theory are more involved, as illustrated here. The iteration on Teichmüller space which is used to prove Thurston's Theorem is of at least comparable importance. It is often said, as is true, that research in complex dynamics over recent decades has been largely inspired by computer graphics. Nowhere is this more true than for studies of mating. In large part this is due to Arnaud Cheritat's now-famous movies of matings, which were a constant reference point for talks at the 2011 Toulouse workshop in matings, and which make use of Thurston's theorem and of recent studies and applications of it. So we have not just graphics, but motion, and I think it is this which makes the study of matings so appealing — truly dynamic — good for another thirty years?

Mary Rees