Adrien Douady Biography

Adrien Douady

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Contents

Adrien Douady Biography.....1

Contents.....2

Biography.....3

Biography

Adrien Douady is Professor of Mathematics at the University of Paris-Sud Orsay. He was born September 25, 1935. He became a correspondent of the French Academy of Sciences on March 3, 1997.

Douady is best known for his studies of the **Mandelbrot set** and its role in the description of dynamics of iterative processes. Mandelbrot **sets** describe the behavior of **functions** of the form f(z)=z*z+c as c varies over the complex plane. Iterative processes are those in which each consecutive term in a sequence is obtained by applying a given function its predecessor. For example, given the simple **parabola** defined by function $f(x) = x^2$ with x real, it is possible to start with a point x_0 and then form the following sequence by **iteration**: x_0, $x_1 = f(x_0)$, $x_2 = f(x_1)$, $x_3 = f(x_2)$, etc.

According to a fundamental **theorem** of mathematics, **polynomials** should be studied in the complex plane rather than on the real lines. Douady's study of simple second-degree polynomials in the complex plain provided new insight into the behavior of more general iterative processes.

Fundamental contributions to the understanding of iterative processes had been made by Gaston Julia (1893-1978) and Pierre Fatou (1878-1929) in the early part of the twentieth century. But their work went largely forgotten by mathematicians until Benoit Mandelbrots's discovery of **fractals** (Mandelbrot coined the term in 1975). Mandelbrot's discovery led to a revival of interest in the properties of iterations, which proved to be essential for the theory of fractals. Mandelbrot drew the first of what Douady very quickly named Mandelbrot sets in 1980.