Contents

Part 1. Analysis, Number Theory, and Dynamical System	115
Preface	ix
List of Tributes	xi
Fractal geometry and applications—An introduction to this volume MICHEL L. LAPIDUS	1
Tributes	27
ANALYSIS	
Reflections, ripples and fractals MICHEL MENDÈS FRANCE	67
Lacunarity, Minkowski content, and self-similar sets in $\mathbb R$ MARC FRANTZ	77
Fractals and geometric measure theory: Friends and foes Frank Morgan	93
Eigenmeasures, equidistribution, and the multiplicity of β -expansions HILLEL FURSTENBERG and YITZHAK KATZNELSON	97
Distances on topological self-similar sets Atsushi Kameyama	117
Energy and Laplacian on the Sierpiński gasket Alexander Teplyaev	131
Electrical networks, symplectic reductions, and application to the renormalization map of self-similar lattices Christophe Sabot	155
Notes on Bernoulli convolutions BORIS SOLOMYAK	207

NUMBER THEORY

Some connections between Bernoulli convolutions and analytic number theory
TITUS HILBERDINK 233

On Davenport expansions STÉPHANE JAFFARD	273
Hausdorff dimension and Diophantine approximation M. Maurice Dodson and Simon Kristensen	305
Fractality, self-similarity and complex dimensions MICHEL L. LAPIDUS and MACHIEL VAN FRANKENHUIJSEN	349
DYNAMICAL SYSTEMS	
The invariant fractals of symplectic piecewise affine elliptic dynamics Byungik Kahng	375
Almost sure rotation number of circle endomorphisms SYLVAIN CROVISIER	391
Kneading determinants and transfer operators in higher dimensions VIVIANE BALADI	407
The spectrum of dimensions for Poincaré recurrences for nonuniformly hyperbolic geometric constructions VALENTIN AFRAIMOVICH, LETICIA RAMÍREZ, and EDGARDO UGALDE	417
A Survey of results in random iteration MARK COMERFORD	435
On fibers and local connectivity of Mandelbrot and Multibrot sets DIERK SCHLEICHER	477
Contents	
Part 2. Multifractals, Probability and Statistical Mechanics, Applications	ı
Preface	ix
List of Tributes	xi
MULTIFRACTALS	
Introduction to infinite products of independent random functions (Random multiplicative multifractal measures, Part I) JULIEN BARRAL and BENOÎT B. MANDELBROT	3
Non-degeneracy, moments, dimension, and multifractal analysis for random multiplicative measures (Random multiplicative multifractal measures, Part II) JULIEN BARRAL and BENOÎT B. MANDELBROT) 17

Techniques for the study of infinite products of independent random functions (Random multiplicative multifractal measures, Part III)	
Julien Barral	53
Wavelet techniques in multifractal analysis Stéphane Jaffard	91
The 2-microlocal formalism JACQUES LÉVY VÉHEL and STÉPHANE SEURET	153
A vectorial multifractal formalism JACQUES PEYRIÈRE	217
PROBABILITY AND STATISTICAL MECHANICS	
Heat kernel estimates for symmetric random walks on a class of fractal graphs	
and stability under rough isometries BEN M. HAMBLY and TAKASHI KUMAGAI	233
Random fractals and Markov processes YIMIN XIAO	261
On the scaling limit of planar self-avoiding walk GREGORY F. LAWLER, ODED SCHRAMM, and WENDELIN WERNER	339,
Conformal fractal geometry & boundary quantum gravity BERTRAND DUPLANTIER	365
APPLICATIONS	
Self-organized percolation power laws with and without fractal geometry in the etching of random solids	
Agnès Desolneux, Bernard Sapoval, and Andrea Baldassarri	485
Nature inspired chemical engineering—Learning from the fractal geometry of nature in sustainable chemical engineering MARC-OLIVIER COPPENS	507
Fractal forgeries of nature F. KENTON MUSGRAVE	533