

# Preface

The third edition of the conference ‘Fractals and related fields’ (FARF 3) took place on Porquerolles Island one year ago, in September 2015. During this intense week, about 150 fractalists have listened to more than 60 talks, including a night session driven by many enthusiastic young colleagues and students.

Preparing and organizing such a conference is always both a challenge and an adventure. But it is also extremely rewarding, every four years, to witness the progress of the science of many (sometimes unexpected) directions, to promote discussions, to stimulate the ‘new generation’ with so many interesting talks. The growing success of this FARF series, the scientific advances presented during FARF 3 and in the present book, as well as the increasing number of PhD students and post-docs attending the conference, reflect the vitality of fractal geometry and its related fields.

It is a tradition now, as in the previous editions, to invite the main speakers to contribute to proceedings of the conference, either by an original paper, a survey paper, or a mixture of both. Thus, this book gathers these contributions by eminent and generous colleagues, and their co-authors.

The topics covered in this book include:

- Dynamical Diophantine approximation
- Random coverings problems
- Bernoulli convolutions; growth of entropy for convolutions via additive combinatorics and its applications to fractal geometry
- Geometric measure theory
- Parametric IFS and their connection with the so-called parablenders in hyperbolic differentiable dynamics
- Dimensions of projections and sections of self-similar sets
- Random Cantor measures and their applications to the restriction problem for fractal measures, and the connection between arithmetic structure and Fourier decay
- Multifractal properties of generic continuous functions; pointwise singularity classification

- Self-affine tiles and measures, and associated Fourier bases and frames
- Stochastic analysis on fractals.

Many other subjects have also been discussed and debated in the conference: the slides of the talks are collected and can be found on the web site <http://sites.math.u-pem.fr/farf3/node/11>. It is interesting to watch over the years the evolution of the topics addressed during the FARF and also the other fractal conferences. Recently there have been many breakthroughs in IFS theory, dynamical systems and Diophantine approximation, extensions of Marstrand's projection and slicing theorems. We are impatient and looking forward to seeing what will be coming next—maybe we will discover this in the next Fractal and Related Fields conference, and the associated proceedings !

We dedicate this book to the memory of Jean-Pierre Kahane, who inspired many generations of mathematicians.

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