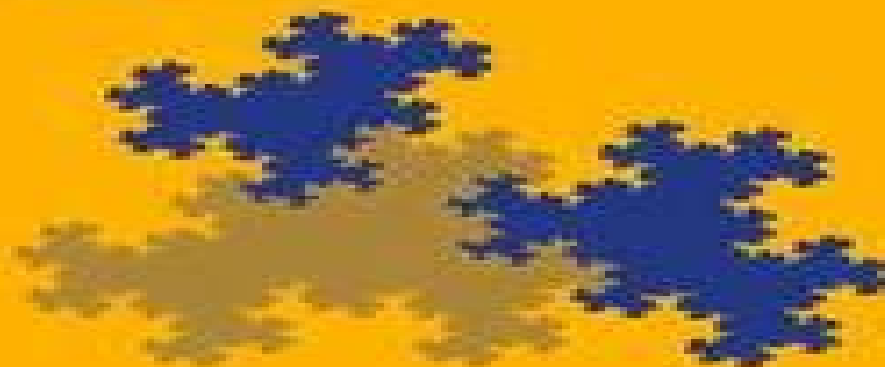


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Substitutions in Dynamics, Arithmetics and Combinatorics

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Substitutions In Dynamics Arithmetics And Combinatorics

Sébastien Ferenczi, Joanna Kułaga-Przymus, Mariusz Lemańczyk



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Rigo, 2010-08-12 This collaborative volume presents recent trends arising from the fruitful interaction between the themes of combinatorics on words automata and formal language theory and number theory Presenting several important tools and concepts the authors also reveal some of the exciting and important relationships that exist between these different fields Topics include numeration systems word complexity function morphic words Rauzy tilings and substitutive dynamical systems Bratelli diagrams frequencies and ergodicity Diophantine approximation and transcendence asymptotic properties of digital functions decidability issues for DOL systems matrix products and joint spectral radius Topics are presented in a way that links them to the three main themes but also extends them to dynamical systems and ergodic theory fractals tilings and spectral properties of matrices Graduate students research mathematicians and computer scientists working in combinatorics theory of computation number theory symbolic dynamics fractals tilings and stringology will find much of interest in this book

Substitution and Tiling Dynamics: Introduction to Self-inducing Structures Shigeki Akiyama, Pierre Arnoux, 2020-12-05 This book presents a panorama of recent developments in the theory of tilings and related dynamical systems It contains an expanded version of courses given in 2017 at the research school associated with the Jean Morlet chair program Tilings have been designed used and studied for centuries in various contexts This field grew significantly after the discovery of aperiodic self similar tilings in the 60s linked to the proof of the undecidability of the Domino problem and was driven further by Dan Shechtman's discovery of quasicrystals in 1984 Tiling problems establish a bridge between the mutually influential fields of geometry dynamical systems aperiodic order computer science number theory algebra and logic The main properties of tiling dynamical systems are covered with expositions on recent results in self similarity and its generalizations fusions rules and S adic systems algebraic developments connected to physics games and undecidability questions and the spectrum of substitution tilings

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Substitution Dynamical Systems - Spectral Analysis Martine Queffélec, 2010-01-30 This volume mainly deals with the dynamics of finitely valued sequences and more specifically of sequences generated by substitutions and automata Those sequences demonstrate fairly simple combinatorial and arithmetical properties and naturally appear in various domains As the title suggests the aim of the initial version of this book was the spectral study of the associated dynamical systems the first chapters consisted in a detailed introduction to the mathematical notions involved and the description of the spectral invariants followed in the closing chapters This approach combined with new material added to the new edition results in a nearly self contained book on the subject New tools which have also proven helpful in other contexts had to be developed for this study Moreover its findings can be concretely applied the method providing an algorithm to exhibit the spectral measures and the spectral multiplicity as is demonstrated in several examples Beyond this advanced analysis many readers will benefit from the introductory chapters on the spectral theory of dynamical systems others will find complements on the spectral study of bounded sequences finally a very basic presentation of substitutions together with some recent findings and questions rounds out the book

Combinatorics on Words Juhani Karhumäki, Arto Lepistö, Luca Zamboni, 2013-08-15 This book constitutes the refereed proceedings of the 9th International Conference on Combinatorics on Words WORDS 2013 held in Turku Finland in September 2013 under the auspices of the EATCS The 20 revised full papers presented were carefully reviewed and selected from 43 initial submissions The central topic of the conference is combinatorics on words i.e. the study of finite and infinite sequence of symbols from varying points of view including their combinatorial algebraic and algorithmic aspects as well as their applications

Ergodic Theory and Dynamical Systems in their Interactions with Arithmetics and Combinatorics Sébastien Ferenczi, Joanna Kułaga-Przymus, Mariusz Lemańczyk, 2018-06-15 This book concentrates on the modern theory of dynamical systems and its interactions with number theory and combinatorics The greater part begins with a course in analytic number

theory and focuses on its links with ergodic theory presenting an exhaustive account of recent research on Sarnak's conjecture on Möbius disjointness. Selected topics involving more traditional connections between number theory and dynamics are also presented including equidistribution, homogeneous dynamics and Lagrange and Markov spectra. In addition, some dynamical and number theoretical aspects of aperiodic order, some algebraic systems and a recent development concerning tame systems are described.

Mathematics of Aperiodic Order Johannes Kellendonk, Daniel Lenz, Jean Savinien, 2015-06-05

What is order that is not based on simple repetition, that is periodicity? How must atoms be arranged in a material so that it diffracts like a quasicrystal? How can we describe aperiodically ordered systems mathematically? Originally triggered by the later Nobel prize winning discovery of quasicrystals, the investigation of aperiodic order has since become a well established and rapidly evolving field of mathematical research with close ties to a surprising variety of branches of mathematics and physics. This book offers an overview of the state of the art in the field of aperiodic order presented in carefully selected authoritative surveys. It is intended for non experts with a general background in mathematics, theoretical physics or computer science and offers a highly accessible source of first hand information for all those interested in this rich and exciting field. Topics covered include the mathematical theory of diffraction, the dynamical systems of tilings or Delone sets, their cohomology and non commutative geometry, the Pisot substitution conjecture, aperiodic Schrödinger operators and connections to arithmetic number theory.

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web described the procedure for combining these methods is discussed 2 1 eo process the process flow diagram of the designed eo process is shown in figure 1 here the

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