CONTEMPORARY MATHEMATICS

678

Ergodic Theory, Dynamical Systems, and the Continuing Influence of John C. Oxtoby

Oxtoby Centennial Conference
October 30–31, 2010
Bryn Mawr College, Bryn Mawr, PA

Williams Ergodic Theory Conference
July 27–29, 2012
Williams College, Williamstown, MA

AMS Special Session
Ergodic Theory and Symbolic Dynamics
January 17–18, 2014
Baltimore, MD

Joseph Auslander
Aimee Johnson
Cesar E. Silva
Editors

American Mathematical Society

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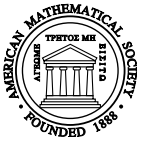

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10 9 8 7 6 5 4 3 2 1 21 20 19 18 17 16

Contents

Preface vii

Oxtoby Centennial Conference, speakers and participants ix

Williams Ergodic Theory Conference, speakers and participants xiii

AMS Special Session on Ergodic Theory and Symbolic Dynamics, speakers xv

Conjugacy in the Cantor set automorphism group
Ethan Akin 1

The mathematical work of John C. Oxtoby
Steve Alpern, Joseph Auslander, and Cesar E. Silva 43

The Čech cohomology and the spectrum for 1-dimensional tiling systems
Tetyana I. Andress and E. Arthur Robinson, Jr. 53

Markov diagrams for some non-Markovian systems
Kathleen Carroll and Karl Petersen 73

Contractive spaces and relatively contractive maps
Darren Creutz 103

Mandelpinski structures in the parameter planes of rational maps
Robert L. Devaney 133

Substitutions and Möbius disjointness
S. Ferenczi, J. Kułaga-Przymus, M. Lemańczyk, and C. Mauduit 151

Subshifts with slowly growing numbers of follower sets
Thomas French, Nic Ormes, and Ronnie Pavlov 175

Haar measures and Hausdorff dimensions of p-adic Julia sets
Joanna Furno 187

Lebesgue measure theoretic dynamics of rational maps
Jane Hawkins 197

The inverse problem for canonically bounded rank-one transformations
Aaron Hill 219

Higher dimensional shift spaces with shear
Steve Kass and Kathleen Madden 231

Hereditary subshifts whose simplex of invariant measures is Poulsen
Joanna Kułaga-Przymus, Mariusz Lemańczyk, and Benjamin Weiss 245

Sustitutions, symbolic codings, and discrepancy
David Ralston 255

Nearly continuous even Kakutani equivalence of nearly continuously rank-one transformations
Bethany D. Springer 277

Dynamics of self-similar interval exchange transformations on three intervals
Kelly Yancey 297

Preface

The work of John C. Oxtoby was fundamental for the fields of measure theory and ergodic theory, and paved the way for many advances in these fields. His contributions were numerous and include his classic monograph, "Measure and Category,"along with the oft-quoted Oxtoby-Ulam theorem. His life was celebrated at the Oxtoby Centennial Conference held at Bryn Mawr College on October 30–31, 2010. This conference, held at the institution where Oxtoby spent most of his professional life, featured 14 speakers and over 30 participants and included recollections on Oxtoby's life by his son David and his daughter Margaret. The webpage for this conference can be found at

http://web.williams.edu/Mathematics/csilva/Oxtoby_Centennial_Conf.htm

These proceedings serve as a tangible record of that celebration along with two subsequent conferences: the Williams Ergodic Theory Conference, held at Williams College on July 27-29, 2012, and the AMS Special Session on Ergodic Theory and Symbolic Dynamics at the joint AMS/MAA meetings in Baltimore on January 17-18, 2014. Webpages for these events can be found at:

http://web.williams.edu/Mathematics/csilva/Williams_ErgodicTheory2012.html

http://jointmathematicsmeetings.org/meetings/national
/jmm20142160_program_ss31.html#title

The articles contained in this volume are from the participants of these three conferences and comprise a variety of topics in both measurable and symbolic dynamics. These include a survey article on the life and work of Oxtoby, providing a source of information about the many ways Oxtoby's work influenced mathematical thought in this and other fields.

We thank the co-organizers of the Oxtoby Centennial Conference, Leslie Cheng and Paul Melvin, for their invaluable help in organizing such an endeavor. We gratefully acknowledge the National Science Foundation, grant DMS-1058120, and the Bryn Mawr College 1902 Lecture Fund for their financial support. The National Science Foundation grant DMS-1058120 also supported the Williams Ergodic Theory Conference, with additional financial support provided by Williams College. Finally, we thank all of the speakers for their wonderful talks and the participants for making these three conferences such a success.

Joseph Auslander
Aimee Johnson
Cesar E. Silva

Oxtoby Centennial Conference, organized by Joseph Auslander, Leslie Cheng, Aimee Johnson, Paul Melvin, and Cesar E. Silva. Bryn Mawr College, October 30–31, 2010

Ethan Akin (CCNY), *Good measures on the Cantor set*

Tim Austin (Brown University), *The quantitative ergodic theorem and embeddings of groups into Banach spaces*

Robert Devaney (Boston University), *The fractal geometry of the Mandelbrot set*

Jane Hawkins (UNC Chapel Hill), *Families of type III_0 ergodic transformations in distinct orbit equivalent classes*

Fern Hunt (NIST), *A model of routing in computer networks*

Mike Keane (Wesleyan University), *Understanding ergodicity*

Kathryn Lindsey (Cornell University), *Tight upper bounds on the number of invariant components on translation surfaces by connected component of moduli space*

Nelson Markley (University of Maryland and Lehigh University), *Completing the Weil-Hedlund-Anosov program*

Dan Mauldin (University of North Texas), *Some problems and techniques inspired by John C. Oxtoby*

Kevin McGoff (University of Maryland), *Random subshifts of finite type*

V.S. Prasad (University of Massachusetts, Lowell), *Continuous versions of the homeomorphic measures theorem*

Bethany Springer (Colorado State), *Some results in almost continuous dynamics*

Susan Williams (University of South Alabama), *Oxtoby and Toeplitz minimal systems: An excursion*

Kelly Yancey (University of Illinois), *Continuous and smooth realizations of ergodic transformations of finite entropy*

Participants in addition to speakers

Joseph Auslander (University of Maryland)

Karl Backs (University of North Texas)

Andres del Junco (University of Toronto)

Joanna Furno (University of North Carolina, Chapel Hill)

Geoff Goodson (Towson University)

Gernot Greschonig (University of Vienna and University of Maryland)

Aimee Johnson (Swarthmore College)

Jonathan King (University of Florida)

Lorelei Koss (Dickinson College)

Kathleen Madden (Drew University)

Nelson Markley (University of Maryland and Lehigh University)

Dan Mauldin (University of North Texas)

David McClendon (Swarthmore College)

Kevin McGoff (University of Maryland)

Paul Melvin (Bryn Mawr College)

Joseph Moser (West Chester University)

Anima Nagar (Indian Institute of Technology Delhi, India)

Mahesh Nerurkar (Rutgers University Camden)

David Oxtoby (Pomona College)

Vincent Peck (IBM)

Vallorie J. Peridier (Temple University)

Karl Petersen (University of North Carolina, Chapel Hill)

Amit Priyadarshi (Rutgers University)

Joe Rosenblatt (University of Illinois, Urbana-Champaign)

Niketa Salvi (Colorado State University and DePaul University)

Michael Sears (University of the Witwatersrand)

Nicholas Sharpe (University of Florida)

Cesar E. Silva (Williams College)

Bethany Springer (Colorado State University and University of Toronto)

Lisa Traynor (Bryn Mawr College)

Conan Wu (Princeton University)

Andy Yingst (University of South Carolina)

Figure 1. Oxtoby Centennial Conference Participants.
Courtesy of Cesar E. Silva

Figure 2. Oxtoby Centennial. Undergraduate Lecture Participants.
Courtesy of Cesar E. Silva

Figure 3. Williams Ergodic Theory Conference Participants.
Courtesy of Cesar E. Silva

Williams Ergodic Theory Conference, organized by Joseph Auslander and Cesar E. Silva. Williams College, July 27–29, 2012

Jon Aaronson (Tel Aviv University, Israel), *Rational weak mixing in infinite measure spaces*

Ethan Akin (The City College, New York, USA), *Homeomorphisms of the Cantor set*

Rachel Bayless (University of North Carolina, Chapel Hill, USA), *Negative generalized Boole transformations and Krengel entropy*

Darren Creutz (Vanderbilt University, USA), *Stabilizers of ergodic actions of lattices and commensurators*

Alexandre Danilenko (Institute for Low Temperature Physics, Ukraine), *Odometer actions of Heisenberg group*

Jared Hallett (Williams College), *On Li-Yorke measurable sensitivity*

Jane Hawkins (University of North Carolina, Chapel Hill, USA), *Complex dynamics and infinite ergodic theory*

Yuri Karlovich (Universidad Autonoma del Estado de Morelos, Mexico), *Ergodic number theory and AP factorization of almost periodic matrix functions*

Zemer Kosloff (Tel Aviv University, Israel), *Maharam extensions of nonsingular Bernoulli shifts*

Mariusz Lemanczyk (Nicolaus Copernicus University, Poland), *Self-joinings of higher order in the problem of non-reversibility of ergodic flows*

Tudor Pădurariu (University of California, Los Angeles), *On rationally ergodic and rationally weakly mixing rank-one transformations*

Kyewon Park (Ajou University, South Korea), *Entropy dimension: examples*

V.S. Prasad (University of Massachusetts Lowell, USA), *Tilings of the integers arising from a class of infinite measure preserving transformations*

Emmanuel Roy (University of Paris 13, France), *Prime Poisson suspensions*

Ilya Vinogradov (Princeton University), *Effective bisector estimate for PSL(2,C) with applications to circle packings*

Kelly Funk Yancey (University of Illinois) *Generic homeomorphisms*

Participants in addition to speakers

Joseph Auslander (University of Maryland)

Rachel Bayless, (University of North Carolina, Chapel Hill)

Darren Creutz (Vanderbilt University)

Irving Dai (Harvard University)

Andres del Junco (University of Toronto)

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Ben Wilson (University of North Carolina, Chapel Hill)

Evangelie Zachos (Princeton University)

AMS Special Session on Ergodic Theory and Symbolic Dynamics, organized by Aimee Johnson and Cesar E. Silva. Baltimore, MD, January 17–18, 2014

Tim Austin (Courant Institute, New York University), *Partial difference equations over compact Abelian groups*

Jon Chaika (University of Utah), *Topological mixing for residual sets of interval exchange transformations*

Joanna Marie Furno (Dickinson College), *Orbit equivalence classes of p-adic transformations*

Jane M. Hawkins (NSF/University of N. Carolina at Chapel Hill), *Bernoulli properties and Julia sets for maps of the real projective plane*

Joseph L Herning (The George Washington University), *Bijective substitutions without topological subshift factors isomorphic to their maximal equicontinuous factors*

Aaron Hill (University of North Texas), *The isomorphism problem for rank-1 systems*

Steve Kass (Drew University), *A sufficient condition for non-soficness of higher-dimensional subshifts*

Konstantin Medynets (United States Naval Academy), *Second order ergodic theorem for substitution tiling systems*

David M. McClendon (Ferris State University), *Speedup equivalence of ergodic $\mathbb{Z}^d-$actions*

Kevin McGoff (Duke University), *Random $\mathbb{Z}^d$ subshifts of finite type*

Francis C. Motta (Colorado State University), *Optimally topologically transitive orbits of the Bernoulli shift map*

Nicholas Ormes (University of Denver), *Extender sets and multidimensional subshifts*

Ronnie Pavlov (University of Denver), *A characterization of topologically completely positive entropy for shifts of finite type*

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This volume contains the proceedings of three conferences in Ergodic Theory and Symbolic Dynamics: the Oxtoby Centennial Conference, held from October 30–31, 2010, at Bryn Mawr College; the Williams Ergodic Theory Conference, held from July 27–29, 2012, at Williams College; and the AMS Special Session on Ergodic Theory and Symbolic Dynamics, held from January 17–18, 2014, in Baltimore, MD.

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