

Alexander Fish

## CURRICULUM VITAE

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### Personal data:

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### Education:

2000-2007: Ph.D. in Mathematics, The Hebrew University. Thesis title : *Weak-mixing sets in  $\mathbb{N}$  and their Ramsey properties*. Thesis advisor: Prof. Hillel Furstenberg.

1998-2000: M.A. **with distinction** in Mathematics , Bar-Ilan University. Thesis title: *Locally nilpotent derivations on the ring of Polynomials*. Thesis advisors: Prof. Leonid Makar-Limanov, Prof. Louis H. Rowen, Prof. Mina Teicher.

1994-1998: B.A. **with distinction** in Mathematics and Computer Science , Bar-Ilan University.

### Employment

2009 -: Van Vleck Assistant Professor, Department of Mathematics, University of Wisconsin-Madison.

2006 - 2009: Zassenhaus Assistant Professor, Department of Mathematics, The Ohio State University.

Aug. 2008 - Dec. 2008: Postdoctorate Fellow, MSRI, Berkeley.

2000-2006: Research & Teaching Assistant, The Hebrew University.

1997-2000: Research & Teaching Assistant, Bar-Ilan University.

## Publications

1. Polynomial largeness of sumsets and totally ergodic sets, to appear in Online Journal of Analytic Combinatorics.
2. (with F.Nazarov, D. Ryabogin and A. Zvavitch) The unit ball is an attractor of the intersection body operator, to appear in Advances in Mathematics.
3. Solvability of linear equations within the weak mixing sets, to appear in Israel Journal of Math.
4. (with M. Beiglböck and V.Bergelson) Sumset Phenomenon in Countable Amenable Groups, Advances in Mathematics 223 (2010) 416-432.
5. (with M. Beiglböck; V. Bergelson; T. Downarowicz) Solvability of Rado systems in D-sets, Topology Appl. 156 (2009), no. 16, 2565–2571
6. (with M. Björklund) Equidistribution of Dilations of Polynomial Curves in Nil-manifolds, Proc. Amer. Math. Soc. 137 (2009), 2111-2123.
7. (with M. Björklund) Continuous Measures on Homogenous Spaces, Annales de l'institut Fourier, 59 no. 6 (2009), p. 2169-2174.
8. (with M. Einsiedler) Rigidity of measures invariant under the action of a multiplicative semigroup of polynomial growth on  $\mathbb{T}$ , Ergodic Theory and Dynamical Systems, 30 (2010), no. 1, 151–157.
9. Liouville random functions and normal sequences, Acta Arith. 120 (2005), 191-196.

## Preprints

1. (with M. Björklund) Product set theorems in countable amenable groups.
2. (with M.Björklund) Ergodic Plünnecke inequalities, in preparation.

## **Teaching Experience:**

2009 - present: Instructor in University of Wisconsin. Includes Calculus for Honors, Introduction to Probability, Calculus.

2006 - 2009: Instructor in Ohio State University. Includes: Calculus (of several variables), Linear Algebra and its Applications, Probability, Real Analysis (undergraduate), Real Analysis (graduate).

2000-2006: Teaching Assistant at the Hebrew University. Includes: Linear Algebra, Advanced Calculus, Differential Equations, Measure Theory, Probability Theory (introductory course and advanced course), Complex Analysis, Basic Notions of Modern Analysis (for graduate students).

1997-2000: Teaching Assistant at Bar-Ilan University. Includes: Linear Algebra, General Topology, Advanced Calculus, Complex Analysis.

## **Talks**

October 2010 - Wayne State University, Colloquium.

September 2010 - Kent State University, Analysis Seminar.

July 2010 - Schrödinger Institute, Vienna, Austria.

May 2010 - University of North Carolina, Ergodic Theory Workshop.

November 2009 - University of Illinois at Chicago, Midwest Dynamical Systems Conference.

October 2009 - University of Wisconsin, Madison, Number Theory Seminar.

July 2009 - University of New South Wales, 1-st PRIMA Congress, Dynamical Systems Section.

May 2009 - Institut Henri Poincaré, Paris, France; Conference Dynamical Systems and Randomness.

April 2009 - Kent State University, Colloquium.

April 2009 - Northwestern University, Dynamics Seminar.

March 2009 - KTH, Stockholm, Dynamics Seminar.

Jan. 2009 - University of Wisconsin, Madison, Analysis Seminar.

Oct. 2008 - Penn State University, Semi-annual Workshop in Dynamical Systems and Related Topics.

Oct. 2008 - MSRI, Special program in additive combinatorics and ergodic theory, Seminar.

May 2008 - University of Memphis, International Conference on Interdisciplinary Mathematical & Statistical Techniques, IMST 2008, Special Session in Ergodic Theory.

March 2008 - KTH, Stockholm, Dynamics Seminar.

February 2008 - Kent State University, Measure Theory Seminar.

Oct. 2007 - DePaul University, Chicago Illinois, AMS Sectional Meeting, Special Session on Ergodic Theory.

Apr. 2007 - University of Michigan, Geometry Seminar.

Dec. 2006 - Kent State University, Informal Analysis Seminar.

Oct. 2006 - AMS Sectional Meeting, Special Session on Ergodic Theory.

May 2006 - Annual meeting of Israel Mathematical Union, Probability and Dynamical Systems session.

Feb. 2006 - Ohio State University, Dynamics Seminar; Kansas State University, Analysis Seminar; Northwestern University, Dynamics Seminar.

January 2006 - the Hebrew University of Jerusalem, Dynamics Seminar.

March 2005 - the Hebrew University of Jerusalem, Combinatorics Seminar.

Nov. 2004 - Bar-Ilan University, Combinatorics Seminar.

Sep. 2004 - Russian Academy of Sciences, Saint-Petersburg, Seminar on Representation Theory and Dynamical Systems.

June 2004 - the Hebrew University of Jerusalem, Dynamics Seminar.

## **Conferences**

June 17 - 24, 2003 - *Furstenfest - on the occasion of Hillel Furstenberg's retirement*, the Hebrew University of Jerusalem and Ben-Gurion University of the Negev.

December 12-14, 2004 - *Harmonic Analysis, Ergodic Theory and Probability - in honor of Izzy Katznelson's 70th Birthday*, Stanford University.

January 23 - 25, 2006 - *Number Theory and Dynamical Systems*, ETH - FIM Zurich.

February 24 - 27, 2006 - *Lie Groups: Dynamics, Rigidity, Arithmetic - in honor of the 60th birthday of Gregory Margulis*, Yale University, New Haven, CT.

March 18-21, 2007 - *Workshop on Dynamical Systems and Related Topics in honor of Hillel Furstenberg* University of Maryland, College Park.

June 11 - July 6th, 2007 - *Clay Mathematics Institute 2007 Summer School, Homo-*

*geneous Flows, Moduli Spaces and Arithmetic*, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy.

July 9-13, 2007 - *Summer School on Dynamical Systems and Number Theory*, Graz, Austria.

April 5-13, 2008 - *Clay-Fields Conference on Additive Combinatorics, Number Theory, and Harmonic Analysis*, Fields Institute, Toronto, Canada.

May 15-18, 2008 - *International Conference on Interdisciplinary Mathematical & Statistical Techniques*, University of Memphis, Memphis, TN.

June 9-13, 2008 - *Conference on Equidistribution on homogeneous spaces*, Ohio State University, Columbus, OH.

June 22-28, 2008 - *CBMS Conference on Ergodic Ramsey Theory*, Eastern Illinois University, Charleston, IL.

Aug. 21-22, 2008 - *Broader Connections: Ergodic Theory and Additive Combinatorics*, MSRI, Berkeley.

Aug. 25-29, 2008 - *Introduction to Ergodic Theory and Additive Combinatorics*, MSRI, Berkeley.

Oct. 23-26, 2008 - *Semi-annual Workshop in Dynamical Systems and Related Topics*, PennState University, State College.

Nov. 3-7, 2008 - *Discrete Rigidity Phenomena in Additive Combinatorics*, MSRI, Berkeley.

Nov. 30-Dec. 5, 2008 - *Amenability, Groups and Dynamics*, Hebrew University of Jerusalem, Israel.

July 6-10, 2009 - *1-st PRIMA Congress*, University of New South Wales, Sydney, Australia.

April 10-13, 2010 - *Workshop on Dynamical Systems and Related Topics in memory of Dan Rudolph*, University of Maryland.

June 27- July 1, 2010 - *Workshop on infinite ergodic theory and related fields*, Weizmann Institute, Rehovot, Israel.

### **Research Interests**

Ergodic theory, combinatorial number theory, harmonic analysis.

### **Foreign Languages:**

English, Hebrew - fluent.

Russian - mother tongue.

French - reading and writing.

**References:**

Prof. Vitaly Bergelson, The Ohio State University

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Prof. Manfred Einsiedler, ETH-Zurich

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Prof. Hillel Furstenberg, Hebrew University

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