

# CURRICULUM VITAE

Anna Giordano Bruno

17 January 2020

## 1 Short professional biography

- Master degree in Mathematics at Università degli Studi di Udine, 18 March 2004, 110/110 cum laude, thesis *Gruppi pseudocompatti estremali* with supervisor D. Dikranjan.
- Ph.D. in Mathematics at Università degli Studi di Udine, 14 February 2008, thesis *Cardinal invariants of topological groups and applications to  $\kappa$ -pseudocompact groups* with supervisor D. Dikranjan.
- From January 2009 to December 2010 post-doc student at Università degli Studi di Padova, supervisor L. Salce.
- Post-doc student with a grant by INdAM from January to April 2011.
- From May 2011 to November 2016 Researcher in Algebra at Dipartimento di Scienze Matematiche, Informatiche e Fisiche of Università degli Studi di Udine.
- From December 2016 Associate Professor in Algebra at Dipartimento di Scienze Matematiche, Informatiche e Fisiche of Università degli Studi di Udine.
- National Scientific Habilitation for Full Professor from 31 July 2017.
- Member of GNSAGA - INdAM, UMI, EMS, EWM.

## 2 Research activity

### 2.1 Publications

- [1] D. Dikranjan, A. Giordano Bruno, C. Milan: Weakly metrizable pseudocompact groups, *Applied General Topology* 7 (2006) 1–39.
- [2] D. Dikranjan, A. Giordano Bruno:  $w$ -Divisible groups, *Topology and its Applications* 155 (2008) 252–272.
- [3] A. Giordano Bruno: Dense minimal pseudocompact subgroups of compact abelian groups, *Topology and its Applications* 155 (2008) 1919–1928.
- [4] D. Dikranjan, A. Giordano Bruno: Pseudocompact totally dense subgroups, *Proceedings of the American Mathematical Society* 136 (2008) 1093–1103.
- [5] A. Giordano Bruno: Semitopological homomorphisms, *Rendiconti del Seminario Matematico dell’Università degli Studi di Padova* 120 (2008) 79–126.
- [6] D. Dikranjan, A. Giordano Bruno: Arnautov’s problems on semitopological isomorphisms, *Applied General Topology* 10 (2009) 85–119.
- [7] A. Giordano Bruno: Extremal  $\alpha$ -pseudocompact abelian groups, *Forum Mathematicum* 21 (2009) 639–659.
- [8] D. Dikranjan, A. Giordano Bruno, D. Shakhmatov: Minimal pseudocompact group topologies on free abelian groups, *Topology and its Applications* 156 (2009) 2039–2053.
- [9] M. Akhavin, F. Shirazi, D. Dikranjan, A. Giordano Bruno, A. Hosseini: Algebraic entropy of shift endomorphisms on abelian groups, *Quaestiones Mathematicae* 32 (2009) 529–550.
- [10] A. Giordano Bruno: Algebraic entropy of shift endomorphisms on products, *Communications in Algebra* 38 (2010) 4155–4174.

- [11] D. Dikranjan, A. Giordano Bruno, L. Salce: Adjoint algebraic entropy, *Journal of Algebra* 324 (2010) 442–463.
- [12] D. Dikranjan, A. Giordano Bruno, S. Virili: Strings of group endomorphisms, *Journal of Algebra and its Applications* 9 (2010) 933–958.
- [13] D. Dikranjan, A. Giordano Bruno: Functorial topologies and finite-index subgroups of abelian groups, *Topology and its Applications* 158 (2011) 2391–2407.
- [14] D. Dikranjan, A. Giordano Bruno: Topological entropy and algebraic entropy for group endomorphisms, *Proceedings ICTA2011 Islamabad, Pakistan July 4-10 2011 Cambridge Scientific Publishers* 133–214.
- [15] D. Dikranjan, A. Giordano Bruno: The Pinsker subgroup of an algebraic flow, *Journal of Pure and Applied Algebra* 216 (2012) 364–376.
- [16] A. Giordano Bruno, S. Virili: String numbers of abelian groups, *Journal of Algebra and its Applications* 11 (2012) 125–161.
- [17] A. Giordano Bruno, L. Salce: A soft introduction to algebraic entropy, *Arabian Journal of Mathematics* (2012) 69–87.
- [18] D. Dikranjan, A. Giordano Bruno: The connection between topological and algebraic entropy, *Topology and its Applications* 159 (2012) 2980–2989.
- [19] D. Dikranjan, A. Giordano Bruno: Limit free computation of entropy, *Rendiconti dell’Istituto Matematico dell’Università degli Studi di Trieste* 44 (2012) 297–312.
- [20] A. Giordano Bruno: Adjoint entropy vs Topological entropy, *Topology and its Applications* 159 (2012) 2404–2419.
- [21] D. Dikranjan, A. Giordano Bruno: Entropy in a category, *Applied Categorical Structures* 21 (2013) 67–101.
- [22] D. Dikranjan, A. Giordano Bruno: Discrete dynamical systems in group theory, *Note di Matematica* 33 (2013) 1–48.
- [23] F. Berlai, D. Dikranjan, A. Giordano Bruno: Scale function vs Topological entropy, *Topology and its Applications* 160 (2013) 2314–2334.
- [24] D. Dikranjan, A. Giordano Bruno, L. Salce, S. Virili: Fully inert subgroups, *Journal of Group Theory* 16 (2013) 915–939.
- [25] D. Dikranjan, A. Giordano Bruno: Topological groups with a dense free abelian subgroup, *Rendiconti dell’Istituto Matematico dell’Università degli Studi di Trieste* 45 (2013) 137–150.
- [26] D. Dikranjan, A. Giordano Bruno: The Bridge Theorem for totally disconnected LCA groups, *Topology and its Applications* 169 (2014) 21–32.
- [27] D. Dikranjan, A. Giordano Bruno: A factorization theorem for topological abelian groups, *Communications in Algebra* 43 (2015) 212–224.
- [28] A. Giordano Bruno: Topological entropy for automorphisms of totally disconnected locally compact groups, *Topology Proceedings* 45 (2015) 175–187.
- [29] D. Dikranjan, A. Giordano Bruno, L. Salce, S. Virili: Intrinsic algebraic entropy, *Journal of Pure and Applied Algebra* 219 (2015) 2933–2961.
- [30] A. Giordano Bruno, S. Virili: Algebraic Yuzvinski Formula, *Journal of Algebra* 423 (2015) 114–147.
- [31] A. Giordano Bruno, S. Virili: About the Algebraic Yuzvinski Formula, *Topological Algebra and its Applications* 3 (1) (2015) 86–103.
- [32] D. Dikranjan, A. Giordano Bruno, D. Impieri: Characterized subgroups of topological abelian groups, *Axioms* 4 (2015) 459–491.
- [33] D. Dikranjan, A. Giordano Bruno: Entropy on abelian groups, *Advances in Mathematics* 298 (2016) 612–653.
- [34] A. Giordano Bruno, S. Virili: Topological entropy in totally disconnected locally compact groups, *Ergodic Theory and Dynamical Systems* 37 (2017) 2163–2186.

- [35] A. Giordano Bruno, P. Spiga: Some properties of the growth and the algebraic entropy of group endomorphisms, *Journal of Group Theory* 20 (2017) 763–774.
- [36] G. Barbieri, D. Dikranjan, A. Giordano Bruno, H. Weber: Dirichlet sets vs characterized subgroups, *Topology and its Applications* 231 (2017) 50–76.
- [37] G. Barbieri, A. Giordano Bruno, H. Weber: Inclusions of characterized subgroups of  $\mathbb{R}$ , *Topology and its Applications* 221 (2017) 534–555.
- [38] I. Castellano, A. Giordano Bruno: Algebraic entropy on locally linearly compact vector spaces, *Rings, polynomials, and modules* 103-127, Springer Cham, 2017.
- [39] R. Di Santo, D. Dikranjan, A. Giordano Bruno: Characterized subgroups of the circle group, *Ricerche di Matematica* 67 (2018) 625–655.
- [40] I. Castellano, A. Giordano Bruno: Topological entropy on locally linearly compact vector spaces, *Topology and its Applications* 252 (2019) 112–144.
- [41] A. Giordano Bruno, M. Shlossberg, D. Toller: Algebraic entropy on strongly compactly covered groups, *Topology and its Applications* 263 (2019) 117–140.
- [42] D. Dikranjan, A. Giordano Bruno: Entropy on normed semigroups (towards a unifying approach to entropy), *Dissertationes Mathematicae* 542 (2019) 1–90.
- [43] A. Giordano Bruno, P. Spiga, Milnor-Wolf Theorem for the growth of endomorphisms of locally virtually soluble groups, *Journal of Algebra* 546 (2020) 85–118.
- [44] A. Biš, D. Dikranjan, A. Giordano Bruno, L. Stoyanov: Topological entropy, upper Carathéodory capacity and fractal dimensions of semigroup actions, to appear in *Colloquium Mathematicum*.
- [45] A. Giordano Bruno: A Bridge Theorem for the entropy of semigroup actions, to appear in *Topological Algebra and its Applications*.
- [46] A. Giordano Bruno, F. Salizzoni: Additivity of the algebraic entropy for locally finite groups with permutable finite subgroups, submitted.
- [47] D. Dikranjan, A. Fornasiero, A. Giordano Bruno: Algebraic entropy for amenable semigroup actions, submitted.
- [48] D. Dikranjan, A. Fornasiero, A. Giordano Bruno, F. Salizzoni: The addition theorem for locally monotileable monoid actions, submitted.
- [49] D. Dikranjan, A. Giordano Bruno, F. G. Russo: Finiteness of topological entropy for locally compact abelian groups, submitted.

## 2.2 Research projects

I was Principal Investigator of:

- Programma SIR 2014 (36 mesi, dal 23 settembre 2015 al 22 settembre 2018), titolo *Geometric, analytic and dynamical methods for the study of groups and group rings* (GADYGR).

I was member of:

- PRIN 2005, titolo *Commutative rings and their modules: multiplicative ideal theory, homological and topological methods*, progetto locale presso l'Università degli Studi di Udine *Selected topics in topological groups and rings of functions*.
- PRIN 2008, titolo *Anelli commutativi e loro moduli, gruppi abeliani e applicazioni*, progetto locale presso l'Università degli Studi di Padova *Moduli su domini d'integrità, gruppi abeliani topologici ed entropia algebrica*.
- Progetti di Eccellenza 2011/12 della Fondazione CARIPARO presso l'Università degli Studi di Padova, titolo *Algebraic structures and their applications: Abelian and derived categories, algebraic entropy and representation of algebras*.

## 2.3 Post-doc positions

I was supervisor of the following post-doc students:

- Ilaria Castellano: Dynamical aspects of locally compact groups, 1 December 2018 - 31 May 2019.
- Daniele Toller: Dynamical methods for the study of topological groups, 1 February 2018 - 30 October 2018.
- Menachem Shlossberg: Analytic and dynamical methods for the study of topological groups, 1 May 2017 - 30 September 2018.
- Daniele Toller: Characterized subgroups and entropy functions of topological groups, 1 February 2017 - 31 January 2018.

## 2.4 Organization of conferences

I organized the following conferences:

- Dynamical methods in Algebra, Geometry and Topology - Udine (Italy), 4 - 6 July 2018 (General Chair).
- Una Giornata per Silvia - Udine (Italy), 28 September 2018 (Member of the Organizing Committee).
- Session Ergodic Theory and Topological Dynamics at the Joint Meeting of UMI-SIMAI-PTM - Wroclaw (Poland), 17 - 20 September 2018 (Session organizer).
- Dynamics of (semi)group actions - Lodz (Poland), 9 - 12 July 2019 (Member of the Scientific Committee).

## 2.5 Partecipation in conferences

I was invited speaker at:

- Recent Advances in Commutative Rings and Module Theory - Bressanone (Italy), 2016 June 13-17;  
title of the communication: Entropy in locally linearly compact vector spaces.
- 31st Summer Conference on Topology and its Applications - University of Leicester (UK), 2016 August 2-5;  
title of the communication: Characterized subgroups of the circle group.

I gave a main talk at:

- Incontro Nazionale di Algebra Moderna (INdAM) - Roma (Italy), 2010 May 24-28;  
title of the communication: Algebraic entropy for abelian groups.
- First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI - Bilbao (Spain), 2014 June 30 - July 4,  
session "Algebraic Entropy and Topological Entropy";  
title of the communication: Bridge Theorems.

I gave a talk at:

- International Workshop on Topological Groups - Pamplona (Spain), 31 August 31 - 2 September 2005;  
title of the communication: Totally dense pseudocompact subgroups.
- 2006 International Conference on Topology and its Applications - Aegion (Greece), 23 - 26 June 2006;  
title of the communication: Semitopological homomorphisms.
- ItEs 2007 - Sixth Italian-Spanish Conference General Topology and its Applications - Bressanone (Italy), 26 - 29 June 2007; title of the communication: Small minimal dense subgroups of compact abelian groups.
- Workshop on Commutative Rings and Their Modules - Bressanone (Italy), 17 - 20 September 2007;  
title of the communication: w-Divisible groups.
- Groups and Topological Groups Conference 2010 - Essen (Germany), 29 - 30 January 2010;  
title of the communication: Algebraic entropy for non-torsion abelian groups.
- Algebra meets Topology: Advances and Applications - Barcellona (Spain), 19 - 23 July 2010;  
title of the communication: Entropy functions.

- 11st Prague Topological Symposium - Prague (Cech Republic), 8 - 12 August 2011;  
title of the communication: The Bridge Theorem.
- ItEs 2012 - Eighth Italian-Spanish Conference on General Topology and its Applications - Trieste (Italy), 3 - 7 September 2012;  
title of the communication: Entropy on totally disconnected locally compact groups.
- Groups and Topological Groups Conference 2013 - Milano (Italy), 25 - 26 January 2013;  
title of the communication: Limit free computation of topological entropy.
- 28th Summer Conference on Topology and its Applications - Northbay (Canada), 23 - 26 July 2013;  
title of the communication: Topological entropy for automorphisms of totally disconnected locally compact groups.
- Advances in Group Theory and Applications 2015 - Porto Cesareo (Italy), 16 - 19 June 2015;  
title of the communication: Additivity of topological entropy for locally profinite groups.
- XX Congresso U.M.I. - Siena (Italia), 7 - 12 September 2015;  
title of the communication: Come crescono gli endomorfismi gruppali?
- Groups and Topological Groups Conference 2015 - Salerno (Italy), 20 - 21 November 2016;  
title of the communication: Growth and entropy of group endomorphisms.
- Entropies and soficity - Lyon (France), 15 - 19 January 2018.  
Title of the communication: Algebraic entropy for amenable semigroup actions on abelian groups.
- Joint Meeting of UMI-SIMAI-PTM - Wroclaw (Poland), 17 - 20 September 2018.  
Title of the communication: Algebraic entropy for amenable semigroup actions.
- Groups and Topological Groups - Milano (Italy), 21 - 22 June 2019.  
Title of the communication: The addition theorem for the algebraic entropy.
- Dynamics of (Semi-)group Actions - Lodz (Poland), 9 - 12 July 2019.  
Title of the communication: The connection between the topological and the algebraic entropy.
- XXI Congresso dell'Unione Matematica Italiana - Pavia (Italy), 2 - 4 September 2019.  
Title of the communication: La crescita degli endomorfismi gruppali.

Other conferences attended:

- Workshop on Dynamical Systems - Udine (Italia), 2007 September 27-28.
- Una giornata per Silvia. Conferenza in memoria di Silvia Lucido - Padova (Italia), 2010 March 26-27.
- Locally compact groups beyond Lie Theory - Spa (Belgio), 2013 April 1-5.
- Algebraic Structures and Their Applications - Spineto (Italia), 2014 June 16-20.
- Scientific day dedicated to Luigi Salce - Padova (Italy), 2016 September 30.

Invited seminars:

- *Algebraic entropy of generalized shifts*, 10 December 2009 at Seminario Padova - Verona MALGA (moduli, algebre, anelli), Università degli Studi di Padova.
- *Algebraic entropy*, 22 September 2010 at Università degli Studi di Bologna.
- *Entropy on abelian groups*, 10 May 2011 at Seminario Padova - Verona MALGA (moduli, algebre, anelli), Università degli Studi di Padova.
- *Algebraic entropy*, 19 October 2012 at Università degli Studi di Firenze.

## 2.6 Editorial activity

- Guest editor of the volume of Topology and its Applications dedicated to the Workshop on Topology and Topological Groups - Muizenberg, AIMS (South Africa), 6 - 7 December 2017.
- Guest editor of the volume of Topological Algebra and its Applications dedicated to the Conference Dynamical methods in Algebra, Geometry and Topology - Udine (Italy), 4 - 6 July 2018.
- Guest editor of the volume of Topological Algebra and its Applications dedicated to the Conference Dynamics of (semi)group actions - Lodz (Poland), 9 - 12 July 2019.

## 2.7 Attività di revisore

- Referee for: Journal of Pure and Applied Algebra, Topology and its Applications, Journal of Group Theory, Journal of Mathematical Analysis and Applications, Rendiconti del Seminario Matematico dell'Università degli Studi di Padova, Bollettino dell'Unione Matematica Italiana, Applied General Topology, Filomat, Journal of Algebra and its Applications, Mediterranean Journal of Mathematics.
- Revisor of Zentralblatt MATH and Mathematical Reviews.

# 3 Teaching activity

## 3.1 Teaching

Courses given at Università degli Studi di Udine:

- a.a. 2012/13: Titolarità di Algebra I - Modulo 1 (6 CFU - 48 ore) del Corso di Laurea in Matematica.
- a.a. 2013/14: Titolarità di Algebra I - Modulo 2 (6 CFU - 48 ore) del Corso di Laurea in Matematica.
- a.a. 2014/15: Titolarità di Algebra I - Modulo 1 (6 CFU - 48 ore) del Corso di Laurea in Matematica.
- a.a. 2015/16: Titolarità di Algebra I - Modulo 1 (6 CFU - 48 ore) del Corso di Laurea in Matematica; Titolarità di Algebra lineare (6 CFU - 60 ore) del Corso di Laurea in Ingegneria Meccanica.
- a.a. 2016/17: Titolarità di Algebra I - Modulo 1 (6 CFU - 24 ore) del Corso di Laurea in Matematica; Titolarità di Algebra lineare (6 CFU - 60 ore) del Corso di Laurea in Ingegneria Meccanica; Esercitazioni di Matematica di base (1,5 CFU - 12 ore) e di Algebra lineare (1,5 CFU - 12 ore) del Corso di Laurea in TWM.
- a.a. 2017/18: Titolarità di Aritmetica (6 CFU - 48 ore) del Corso di Laurea in Matematica; Titolarità di Algebra I - Modulo 1 (6 CFU - 24 ore) del Corso di Laurea in Matematica; Titolarità di Algebra lineare (6 CFU - 60 ore) del Corso di Laurea in Ingegneria Meccanica.
- a.a. 2018/19: Titolarità di Aritmetica (6 CFU - 48 ore) del Corso di Laurea in Matematica; Titolarità di Algebra I - Modulo 1 (6 CFU - 24 ore) del Corso di Laurea in Matematica; Titolarità di Algebra lineare (6 CFU - 60 ore) del Corso di Laurea in Ingegneria Meccanica; Titolarità di Entropia e sistemi dinamici (6 CFU - 48 ore) del Corso di Laurea Magistrale in Matematica.
- a.a. 2019/20: Titolarità di Aritmetica (6 CFU - 48 ore) del Corso di Laurea in Matematica; Titolarità di Algebra I - Modulo 1 (6 CFU - 24 ore) del Corso di Laurea in Matematica; Titolarità di Algebra lineare (6 CFU - 60 ore) del Corso di Laurea in Ingegneria Meccanica; Titolarità di Topologia e ordine (18 ore) della Scuola Superiore dell'Università degli Studi di Udine.

## 3.2 Thesis

I was supervisor of the following theses:

- Luisa Gallovich: Entropia algebrica per spazi vettoriali, Elaborato di Laurea triennale, Università degli Studi di Udine, a.a. 2011/12.
- Giulia Ruzzene: Il Teorema Ponte tra entropia algebrica e topologica, Elaborato di Laurea triennale, Università degli Studi di Udine, a.a. 2012/13.
- Eleonora Lena: I Teoremi di Prüfer per i  $p$ -gruppi abeliani, Elaborato di Laurea Triennale, Università degli Studi di Udine, a.a. 2014/15.

- Luisa Gallovich: Dualità ed entropia per spazi vettoriali localmente linearmente compatti, Tesi di Laurea Magistrale, Università degli Studi di Udine, a.a. 2015/16 (corelatrice: Dott.ssa I. Castellano).
- Luca Marconato: Frazioni continue e caratterizzazione dei sottogruppi ciclici di  $\mathbb{R}/\mathbb{Z}$ , Elaborato di Laurea Triennale, Università degli Studi di Udine, a.a. 2015/16 (corelatore: Prof. D. Dikranjan).
- Marco Floriduz, La compattezza e le sue forme, Elaborato di Laurea, Università degli Studi di Udine, a.a. 2017/18.
- Flavio Salizzoni, Algebraic entropy of amenable semigroup actions, Tesi di Laurea Magistrale, Università degli Studi di Udine, a.a. 2018/19 (corelatore: D. Dikranjan).
- Elena Dal Savio, Immersione di un semigruppò in un gruppo, Elaborato di Laurea, Università degli Studi di Udine, a.a. 2018/19.