

Chrizaldy Neil Manibo

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Education

Doctor of Mathematics (2019)

Thesis: *Lyapunov Exponents in the Spectral Theory of Primitive Inflation Systems* (Summa cum laude)

Thesis supervisors: Prof. Dr. Michael Baake and Dr. Franz Gähler

Universität Bielefeld, Bielefeld, Germany

Master of Science in Mathematics (2015)

Thesis: *Geometric Structures arising from Representations of Finite Groups: Quantization of $L^2(G)$*

Ateneo de Manila University, Quezon City, Philippines

Bachelor of Science in Physics (2012)

Ateneo de Manila University, Quezon City, Philippines

Research Interests

Spectral Theory, Dynamical Systems, Aperiodic Order, Mathematical Physics

Publications

Peer-Reviewed Publications

1. I. Aedo, U. Grimm, N. Mañibo, Y. Nagai, P. Staynova MONOCHROMATIC ARITHMETIC PROGRESSIONS IN AUTOMATIC SEQUENCES WITH GROUP STRUCTURE, *J. Combin. Th. Ser. A* **2023** 105831 (2024).
2. D. Frettlöh, A. Garber, N. Mañibo, CATALAN NUMBERS AS DISCREPANCIES FOR A FAMILY ON SUBSTITUTIONS ON INFINITE ALPHABETS, *Indag. Math.* (2023), available online.
3. Á. Bustos, N. Mañibo, R. Yassawi, TORSION-FREE S -ADIC SHIFTS AND THEIR SPECTRUM, *Studia Math.* **272** 159–198 (2023).
4. N. Mañibo, D. Rust, J.J. Walton, SPECTRAL PROPERTIES OF SUBSTITUTIONS ON COMPACT ALPHABETS, *Bull. London Math. Soc.* **55** 2425–2445 (2023).
5. Á. Bustos, D. Luz, N. Mañibo, ADMISSIBLE REVERSING AND EXTENDED SYMMETRIES FOR BIJECTIVE SUBSTITUTIONS, *Discrete Comput. Geom.* **69** 800–833 (2023).
6. M. Coons, J. Evans, Z. Groth, N. Mañibo, ZAREMBA, SALEM, AND THE FRACTAL NATURE OF GHOST DISTRIBUTIONS, *Bull. Austr. Math. Soc.* **107** 374–389 (2023).
7. N.P. Frank, N. Mañibo, SPECTRAL THEORY OF SPIN SUBSTITUTIONS, *Discrete Contin. Dynam. Syst.* **42** 5399–5435 (2022).
8. G.B. Escolano, N. Mañibo, E.D. Miro, MIXING PROPERTIES AND ENTROPY BOUNDS OF A FAMILY OF PISOT RANDOM SUBSTITUTIONS, *Indag. Math.* **33** 965–991 (2022).
9. M. Coons, J. Evans, N. Mañibo, SPECTRAL THEORY OF REGULAR SEQUENCES, *Docum. Math.* **27** 629–653 (2022).
10. N. Mañibo, E.D.P. Miro, D. Rust and G. Tadeo, ZECKENDORF REPRESENTATIONS AND MIXING PROPERTIES OF SEQUENCES, *Tsukuba J. Math.* **44** 251–269 (2020).

11. M. Baake, M. Coons, N. Mañibo, BINARY SUBSTITUTIONS OF CONSTANT LENGTH AND MAHLER MEASURES OF BORWEIN POLYNOMIALS, in *From Analysis to Visualization*, B. Sims et.al. (eds.), Springer Proceedings in Mathematics and Statistics **313**, pp. 303–322 (2020).
12. M. Baake, F. Gähler, N. Mañibo, RENORMALISATION FOR PAIR CORRELATION MEASURES FOR PRIMITIVE INFLATION RULES AND ABSENCE OF ABSOLUTELY CONTINUOUS DIFFRACTION, *Commun. Math. Phys.* **370** 591–635 (2019).
13. M. Baake, U. Grimm, N. Mañibo, SPECTRAL ANALYSIS OF A FAMILY OF BINARY INFLATION RULES, *Lett. Math. Phys.* **108** 1783–1805 (2018).
14. N. Mañibo, LYAPUNOV EXPONENTS FOR BINARY SUBSTITUTIONS OF CONSTANT LENGTH, *J. Math. Phys.* **58** 113504 (2017).

Accepted for Publication

1. D. Frettlöh, A. Garber, N. Mañibo, SUBSTITUTION TILINGS WITH TRANSCENDENTAL INFLATION FACTOR, [arXiv:2208.01327](https://arxiv.org/abs/2208.01327), to appear: *Discrete Analysis*.

Preprints

1. N. Mañibo, SUBSTITUTIONS AND THEIR GENERALISATIONS, review article submitted to the Proceedings of the 15th International Conference on Quasicrystals, to appear: *Isr. J. Chem.*, [arXiv:2311.05731](https://arxiv.org/abs/2311.05731).
2. M. Coons, J. Evans, P. Gohlke, N. Mañibo, SPECTRAL THEORY OF REGULAR SEQUENCES: PARAMETRISATION AND SPECTRAL CHARACTERISATION, [arXiv:2307.15185](https://arxiv.org/abs/2307.15185).
3. N. Mañibo, D. Rust, J.J. Walton, SUBSTITUTIONS ON COMPACT ALPHABETS, [arXiv:2204.07516](https://arxiv.org/abs/2204.07516).

Conference Proceedings

1. N. Mañibo, SUBSTITUTIONS ON COMPACT ALPHABETS, *Oberwolfach Reports* **20** 2146–2149 (2023).
2. N. Mañibo, THE MATHEMATICS OF ABSOLUTELY CONTINUOUS DIFFRACTION, *Acta. Cryst. A* **77** C306 (2021).
3. N. Mañibo, RENORMALISATION FOR INFLATION TILINGS II: CONNECTIONS TO NUMBER THEORY, *2019-20 MATRIX Annals*, J. de Gier, et.al. (eds.), pp. 709–711 (2021).
4. N. Mañibo, SPECTRAL ANALYSIS OF PRIMITIVE INFLATION RULES, *Oberwolfach Reports* **14** 2830–2832 (2017).
5. C.N. Mañibo, J. Nable, POISSON AND HOPF STRUCTURES FOR FINITE GROUPS VIA STAR PRODUCT AND CONVOLUTION, *Proceedings of the Physics Society of the Philippines (SPP)*, P. Almoró (ed.), **32** SPP2014-3B-01 (2014).

Conferences, Talks, and Distinctions

Selected Conferences and Workshops

1. Invited Talk: SUBSTITUTIONS ON COMPACT ALPHABETS, *Aspects of Aperiodic Order*, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach (MFO), Germany Aug 27–Sept 1, 2023
2. Invited Talk: SUBSTITUTIONS ON COMPACT INFINITE ALPHABETS, *15th International Conference on Quasicrystals*, Tel Aviv University, Tel Aviv, Israel Jun 19–24, 2023
3. Invited Talk: SUBSTITUTION TILINGS WITH TRANSCENDENTAL INFLATION FACTOR, *Almost Periodicity in Aperiodic Order*, Banff International Research Station, Canada Sep 9–11, 2022

4. Invited Talk: SPECTRAL THEORY OF SPIN SUBSTITUTIONS, *The pursuit of symmetry: A conference in honour of the 80th birthday of Robert V. Moody*, Fields Institute, Toronto, Canada
Apr 25–29, 2022
5. Invited Talk: THE MATHEMATICS OF ABSOLUTELY CONTINUOUS DIFFRACTION, *25th Congress of the International Union of Crystallography: Microsymposium 44*, (hybrid format) Prague, Czechia
Aug 14–22, 2021
6. Invited Talk: RENORMALISATION FOR INFLATION TILINGS II: CONNECTIONS TO NUMBER THEORY, *Aperiodic Order meets Number Theory*, MATRIX centre, Creswick, Victoria, Australia
Feb 25–Mar 1, 2019
7. Invited Talk: DIFFRACTION AND MAHLER MEASURES, *Dyadisc2: Dynamiques et Analyse Discrète: Workshop on the Spectral Analysis of Subshifts*, Université de Picardie Jules Verne, Amiens, France
Jul 9–11, 2018
8. Invited Talk: SPECTRAL ANALYSIS OF PRIMITIVE INFLATION RULES, *Spectral Structures and Topological Methods in Mathematical Quasicrystals*, Mathematisches Forschungsinstitut Oberwolfach (MFO), Oberwolfach, Germany
Oct 1–7, 2017
9. Invited Talk: POISSON AND HOPF STRUCTURES VIA STAR PRODUCT AND CONVOLUTION, *32nd Physics Congress, Physics Society of the Philippines*, University of the Philippines–Diliman, Quezon City, Philippines
Oct 17–20, 2014

Seminars

1. Center for Mathematical Modelling, Santiago, Chile
Jan 2024
2. Pontificia Universidad Católica de Chile, Santiago, Chile
Dec 2023
3. MacEwan University, Edmonton, Canada
Aug 2023
4. Friedrich-Alexander-Universität, Erlangen, Germany
Jun 2023
5. Universidad Autonoma de San Luis Potosí, Mexico (online)
Nov 2022
6. MacEwan University, Edmonton, Canada
Sep 2022
7. Vassar College, New York, USA
Sep 2022
8. University of Birmingham, UK
May 2022
9. Open University, Milton Keynes, UK (online)
Sep 2020
10. *Informal Summer School in Substitutions and Aperiodic Order* (online)
Aug 2020
11. *SFB1283 Block Course Series on Lyapunov Exponents*, Bielefeld University
Jul 2019
12. University of Newcastle, Newcastle, NSW, Australia
Mar 2019
13. Ateneo de Manila University, Quezon City, Philippines
Oct 2018
14. Open University, Milton Keynes, United Kingdom
Aug 2018

Research Visits

1. Visiting Fellow, Center for Mathematical Modelling (CMM), Santiago, Chile Nov 2023–Jan 2024
2. Rogol Distinguished Visitor, Vassar College, New York, USA Sep 2022
3. Visiting Researcher, University of Newcastle, Newcastle, NSW, Australia Mar 2019
4. Visiting Researcher, The Open University, Milton Keynes, United Kingdom Aug 2018
5. Visiting Researcher, The Open University, Milton Keynes, United Kingdom Sep 2017
6. Visiting Researcher, Universität Bielefeld, Bielefeld, Germany Jul–Aug 2015

Distinctions, Grants, and Fellowships

1. Postdoctoral Visiting Fellowship, Center for Mathematical Modelling (CMM), Santiago, Chile
Project title: “*Extended symmetries of substitutive \mathbb{Z}^d -dynamical systems*”
Amount: Approx. 8000 € for 3 months Nov 2023–Jan 2024
2. International Union of Crystallography (IUCr) Award for Young Scientists, 15th International Conference on Quasicrystals, Tel Aviv, Israel June 2023
3. Executive Dean’s Commendation for Academic Excellence, Faculty of Science, Technology, Engineering, and Mathematics, The Open University, Milton Keynes, UK Aug 2022
4. Collaborative involvement: Grant application for Project A6: *Random versus deterministic dynamical systems with aperiodic long-range order* within Collaborative Research Centre 1283: *Taming uncertainty and profiting from randomness and low regularity in analysis, stochastics and their applications* at Bielefeld University, German Research Foundation (DFG), (funded from 2021–2025) May 2021
5. DAAD Postdoctoral Researchers’ International Mobility Experience (PRIME) Grant for an 18-month postdoc in the Open University (Milton Keynes, UK) and Bielefeld University (Germany)
Project title: “*Renormalisation, self-similarity, and spectral theory*”, Amount: Approx. 130,000 € Feb 2020
6. Award for Best PhD Dissertation in the Faculty of Mathematics in 2019 (Dissertationspreis der Universitätsgesellschaft Bielefeld), Bielefeld University, Amount: 1,000 € Jan 2020
7. First Prize, Award for Outstanding Graduate Research for the School of Science and Engineering, Ateneo de Manila University Mar 2015

Work-Related Experience

1. Lecturer, Faculty of Mathematics, Bielefeld University, Germany Oct 2023

Summer Semester 2024	Probability Theory and Statistics
Winter Semester 2023–2024	Math. Methods in the Life Sciences III (Fourier Analysis)
2. Postdoctoral Research Associate, Bielefeld University, Germany Nov 2022–present
3. DAAD PRIME Fellow, The Open University, Milton Keynes, UK Nov 2021–Oct 2022
4. Postdoctoral Research Associate, Bielefeld University, Germany Jul 2019–Oct 2021
5. Research Associate, Bielefeld University, Germany Nov 2015–Jul 2019

6. Tutor, Faculty of Mathematics, Bielefeld University, Germany
(2 contact hours per week)

Nov 2015–Jul 2023

Summer Semester 2023	Selected Topics: Discrete Mathematics
Summer Semester 2021	Selected Topics: Discrete Mathematics
Winter Semester 2020–2021	Group and Representation Theory
Summer Semester 2020	Probability Theory and Statistics
Winter Semester 2019–2020	Linear Algebra for Physicists
Winter Semester 2018–2019	Complex Analysis I
Summer Semester 2018	Group and Representation Theory
Winter Semester 2017–2018	Math. Methods in the Life Sciences III (Fourier Analysis)
Summer Semester 2017	Selected Chapters in Linear Algebra
Winter Semester 2016–2017	Algebra I
Winter Semester 2015–2016	Partial Differential Equations

7. Instructor, Mathematics Department, Ateneo de Manila University,
Philippines (12 contact hours per week)

Jun 2014–Oct 2015

First Semester 2015–2016	Calculus for Business
	Introduction to College Algebra
Summer Semester 2015	Modern Mathematics II
Second Semester 2014–2015	Modern Mathematics I
First Semester 2014–2015	Modern Mathematics I
	Introduction to College Algebra

8. Apprentice, Photonics Laboratory, Physics Department, Ateneo de Manila University, Philippines

2010–2012

Thesis supervision

1. Daniel Luz, PhD Mathematics, Bielefeld University, Germany (co-supervised with Michael Baake)
Jan 2020–present
2. Ibai Aedo, PhD Mathematics, The Open University, Milton Keynes, UK (co-supervised with Uwe Grimm, Ian Short, Reem Yassawi)
PhD Thesis: FORWARD LIMIT SETS OF SEMIGROUPS OF SUBSTITUTIONS AND MONOCHROMATIC ARITHMETIC PROGRESSIONS IN AUTOMATIC SEQUENCES
2023
3. Giovanni Benito Escolano, MS Mathematics, Ateneo de Manila University, Philippines, co-supervised with Eden Miro
MS Thesis: COMBINATORIAL AND TOPOLOGICAL PROPERTIES OF A FAMILY OF RANDOM SUBSTITUTIONS
2020

Conference organization

1. Workshop Co-organiser (with David Damanik, Natalie Frank, Nicolae Strungaru, and Reem Yassawi), *Directions in Aperiodic Order*, Banff International Research Station, Banff, Canada
July 27–August 1, 2025
2. Workshop Co-organiser (with David Damanik and Nicolae Strungaru), *Algebra, Analysis, and Aperiodic Order*, Bielefeld University, Germany
August 12–16, 2024
3. Workshop Co-organiser (with Dan Rust), *Arithmetic and Spectral Structures in Aperiodic Order*, Open University, Milton Keynes, UK
September 22–23, 2022

4. Workshop Co-organiser (with Álvaro Bustos), *Extended Symmetries in Symbolic Dynamics*, Bielefeld University, Germany October 18–19, 2021
5. Member, National Organizing Committee, Mathematical Society of the Philippines Annual Convention, Paoay, Ilocos Norte, Philippines May 18–19, 2015
6. Member, National Organizing Committee, Department of Education K-12 National Training of Trainers for Grade 10 Mathematics, Ateneo de Manila University, Philippines April 13–24, 2015

Refereeing and Editorial Work

1. Served as a reviewer for international journals including *Ergodic Theory and Dynamical Systems*, *Discrete and Continuous Dynamical Systems*, *Proceedings of the American Mathematical Society*, *Houston Journal of Mathematics*, *Journal of the Australian Mathematical Society*, and *Discrete and Computational Geometry*.
2. Current editor for *Aperiodic Order Volume 3: Model Sets and Dynamical Systems* (with M. Baake and F. Gähler)
3. Reporter for Meeting 2335: Oberwolfach Reports, *Aspects of Aperiodic Order*, 2023.