

Chrizaldy Neil Manibo

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Education

Doctor of Mathematics (2019)

PhD Thesis: *Lyapunov Exponents in the Spectral Theory of Primitive Inflation Systems*

Grade: Summa cum laude

Supervisors: Prof. Dr. Michael Baake and Dr. Franz Gähler

Bielefeld University, Germany

Master of Science in Mathematics (2015)

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

Ateneo de Manila University, Philippines

Bachelor of Science in Physics (2012)

Ateneo de Manila University, Philippines

Research Interests

Aperiodic Order, in particular spectral and algebraic aspects of

- shift spaces and tiling dynamical systems
- mathematical diffraction and almost periodic measures
- automatic and regular sequences

Academic Positions

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| 1. Postdoctoral Research Associate (CRC1283), Bielefeld University | since May 2023 |
| 2. Visiting Postdoctoral Fellow, Center for Mathematical Modelling (CMM)
Santiago, Chile | Nov 2023–Jan 2024 |
| 3. DAAD PRIME Fellow, The Open University, Milton Keynes, UK/
Bielefeld University | Nov 2021–Oct 2022
Nov 2022–Apr 2023 |
| 4. Postdoctoral Research Associate (CRC1283), Bielefeld University | Jul 2019–Oct 2021 |
| 5. Research Associate (CRC1283), Bielefeld University | Jul 2017–Jun 2019 |
| 6. Research Associate (CRC701), Bielefeld University
Ateneo de Manila University, Philippines | Nov 2015–Jun 2017
Jun 2014–Oct 2015 |

Publications

Peer-Reviewed Articles

18. N. Mañibo, D. Rust, J.J. Walton, SUBSTITUTIONS ON COMPACT ALPHABETS, *J. London Math. Soc.* **111** e70123 (2025) 48 pp.
17. N. Mañibo, SUBSTITUTIONS AND THEIR GENERALISATIONS, *Isr. J. Chem.* **64** e202300159 (2024) 15 pp.
16. D. Frettlöh, A. Garber, N. Mañibo, SUBSTITUTION TILINGS WITH TRANSCENDENTAL INFLATION FACTOR, *Discr. Anal.* **11** (2024) 24 pp.
15. M. Baake, N. Mañibo, ON THE FULL CENTRALISER OF ERDŐS \mathcal{B} -FREE SHIFTS, *Colloq. Math.* **176** (2024) 121–134.
14. D. Frettlöh, A. Garber, N. Mañibo, CATALAN NUMBERS AS DISCREPANCIES FOR A FAMILY ON SUBSTITUTIONS ON INFINITE ALPHABETS, *Indag. Math.* **35** (2024) 890–913.
13. 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** (2024) 105831, 35 pp.
12. Á. Bustos-Gajardo, N. Mañibo, R. Yassawi, TORSION-FREE S -ADIC SHIFTS AND THEIR SPECTRUM, *Studia Math.* **272** (2023) 159–198.
11. N. Mañibo, D. Rust, J.J. Walton, SPECTRAL PROPERTIES OF SUBSTITUTIONS ON COMPACT ALPHABETS, *Bull. London Math. Soc.* **55** (2023) 2425–2445.
10. Á. Bustos-Gajardo, D. Luz, N. Mañibo, ADMISSIBLE REVERSING AND EXTENDED SYMMETRIES FOR BIJECTIVE SUBSTITUTIONS, *Discr. Comput. Geom.* **69** (2023) 800–833.
9. M. Coons, J. Evans, Z. Groth, N. Mañibo, ZAREMBA, SALEM, AND THE FRACTAL NATURE OF GHOST DISTRIBUTIONS, *Bull. Austral. Math. Soc.* **107** (2023) 374–389.
8. N.P. Frank, N. Mañibo, SPECTRAL THEORY OF SPIN SUBSTITUTIONS, *Discr. Contin. Dynam. Syst.* **42** (2022) 5399–5435.
7. G.B. Escolano, N. Mañibo, E.D. Miro, MIXING PROPERTIES AND ENTROPY BOUNDS OF A FAMILY OF PISOT RANDOM SUBSTITUTIONS, *Indag. Math.* **33** (2022) 965–991.
6. M. Coons, J. Evans, N. Mañibo, SPECTRAL THEORY OF REGULAR SEQUENCES, *Docum. Math.* **27** (2022) 629–653.
5. N. Mañibo, E.D.P. Miro, D. Rust and G. Tadeo, ZECKENDORF REPRESENTATIONS AND MIXING PROPERTIES OF SEQUENCES, *Tsukuba J. Math.* **44** (2020) 251–269.
4. 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, Cham (2020) pp. 303–322.
3. 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** (2019) 591–635.
2. M. Baake, U. Grimm, N. Mañibo, SPECTRAL ANALYSIS OF A FAMILY OF BINARY INFLATION RULES, *Lett. Math. Phys.* **108** (2018) 1783–1805.
1. N. Mañibo, LYAPUNOV EXPONENTS FOR BINARY SUBSTITUTIONS OF CONSTANT LENGTH, *J. Math. Phys.* **58** (2017) 113504, 9 pp.

Preprints

2. Á. Bustos-Gajardo, D. Luz, N. Mañibo, RADIUS-ZERO EXTENDED SYMMETRIES AND IRREGULAR FIBRES OF \mathbb{Z}^d -SUBSTITUTION SUBSHIFTS, [arXiv:2506.13392](#).
1. M. Coons, J. Evans, P. Gohlke, N. Mañibo, SPECTRAL THEORY OF REGULAR SEQUENCES: PARAMETRISATION AND SPECTRAL CHARACTERISATION, [arXiv:2307.15185](#).

Conference Proceedings

4. N. Mañibo, SUBSTITUTIONS ON COMPACT ALPHABETS, *Oberwolfach Reports* **20** (2023) 2146–2149.
3. N. Mañibo, RENORMALISATION FOR INFLATION TILINGS II: CONNECTIONS TO NUMBER THEORY, *2019-20 MATRIX Annals*, J. de Gier, et al. (eds.) (2021) pp. 709–711 .
2. N. Mañibo, SPECTRAL ANALYSIS OF PRIMITIVE INFLATION RULES, *Oberwolfach Reports* **14** (2017) 2830–2832.
1. 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** (2014) SPP2014-3B-01.

Teaching Experience

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|--|-------------------|
| 1. Co-lecturer, Faculty of Mathematics, Bielefeld University
(2 contact hours per week) | Oct 2023–present |
| • SoSe 2025: Ordinary Differential Equations | (BSc, MATH/PHYS) |
| • WiSe 2024–2025: Ergodic Theory and Dynamical Systems | (BSc/MSc, MATH) |
| • SoSe 2024: Probability Theory and Statistics | (BSc, BIO-INF) |
| • WiSe 2023–2024: Mathematical Methods in the Life Sciences III | (MSc, BIO-INF) |
| 2. Tutor, Faculty of Mathematics, Bielefeld University
(2 contact hours per week) | Nov 2015–Jul 2023 |
| • SoSe 2023: Selected Topics: Discrete Mathematics | (BSc, EDUC) |
| • SoSe 2021: Selected Topics: Discrete Mathematics | (BSc, EDUC) |
| • WiSe 2020–2021: Group and Representation Theory | (BSc, PHYS) |
| • SoSe 2020: Probability Theory and Statistics | (BSc, BIO-INF) |
| • WiSe 2019–2020: Linear Algebra for Physicists I | (BSc, PHYS) |
| • WiSe 2018–2019: Complex Analysis | (BSc, MATH) |
| • SoSe 2018: Group and Representation Theory | (BSc, PHYS) |
| • WiSe 2017–2018: Mathematical Methods in the Life Sciences III | (MSc, BIO-INF) |
| • SoSe 2017: Selected Topics in Linear Algebra | (BSc, PHYS) |
| • WiSe 2016–2017: Algebra I | (BSc, MATH) |
| • WiSe 2015–2016: Partial Differential Equations | (MSc, MATH) |

- BIO-INF: Computer Science, Bioinformatics and Genome Research
- MATH: Mathematics
- EDUC: Mathematics for Teachers
- PHYS: Physics

3. Instructor, Mathematics Department, Ateneo de Manila University, Philippines (Bachelor) Jun 2014–Oct 2015

- **First Semester 2015–2016:** Calculus for Business (MGT)
- **First Semester 2015–2016:** Introduction to College Algebra (HUMS+SOCSCI)
- **Summer Semester 2015:** Modern Mathematics II (SOCSCI)
- **Second Semester 2014–2015:** Modern Mathematics I (MGT+SOCSCI)
- **First Semester 2014–2015:** Modern Mathematics I (MGT)
- **First Semester 2014–2015:** Introduction to College Algebra (HUMS)
 - HUMS: Humanities (Philosophy, Literature, European Studies, Creative Writing)
 - MGT: Management (Legal Management, Management Information Systems)
 - SOCSCI: Social Sciences (Communications, Psychology)

Talks and Distinctions

Selected Invited Conference Talks

1. CONTINUOUS DIFFRACTION IN APERIODIC STRUCTURES, *Grimm Network Meeting*, University of Leeds, UK 16 Sep 2024
2. GHOST MEASURES AND THE FINITENESS CONJECTURE FOR SEMIGROUPS OF MATRICES, *12th Mini-workshop on Operator Theoretic Aspects of Ergodic Theory*, Leipzig University, Germany 6–8 Jun 2024
3. SUBSTITUTIONS ON COMPACT ALPHABETS, *Aspects of Aperiodic Order*, Mathematisches Forschungsinstitut Oberwolfach (MFO), Oberwolfach, Germany 27 Aug–1 Sep 2023
4. SUBSTITUTIONS ON COMPACT INFINITE ALPHABETS, *15th International Conference on Quasicrystals*, Tel Aviv University, Tel Aviv, Israel 19–24 Jun 2023
5. SPECTRAL THEORY OF APERIODIC TILINGS, *Foliated Spaces, Tilings and Group Actions 2022*, Ritsumeikan University, Kyoto, Japan (online) 17 Dec 2022
6. SUBSTITUTION TILINGS WITH TRANSCENDENTAL INFLATION FACTOR, *Almost Periodicity in Aperiodic Order*, Banff International Research Station, Canada 9–11 Sep 2022
7. 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 25–29 Apr 2022
8. THE MATHEMATICS OF ABSOLUTELY CONTINUOUS DIFFRACTION, *25th Congress of the International Union of Crystallography: Microsymposium 44*, (hybrid) Prague, Czechia 14–22 Aug 2021
9. RENORMALISATION FOR INFLATION TILINGS II: CONNECTIONS TO NUMBER THEORY, *Aperiodic Order meets Number Theory*, MATRIX Centre, Creswick, Victoria, Australia 25 Feb–1 Mar 2019
10. DIFFRACTION AND MAHLER MEASURES, *Dyadisc2: Dynamiques et Analyse Discrète: Workshop on the Spectral Analysis of Subshifts*, Université de Picardie Jules Verne, Amiens, France 9–11 Jul 2018

11. SPECTRAL ANALYSIS OF PRIMITIVE INFLATION RULES, *Spectral Structures and Topological Methods in Mathematical Quasicrystals*, Mathematisches Forschungsinstitut Oberwolfach (MFO), Oberwolfach
1–7 Oct 2017
12. POISSON AND HOPF STRUCTURES VIA STAR PRODUCT AND CONVOLUTION, *32nd Physics Congress, Physics Society of the Philippines*, University of the Philippines–Diliman, Philippines
17–20 Oct 2014

Selected Seminars and Colloquia

1. Friedrich-Schiller-Universität Jena, Germany
Jul 2025
2. Université de Liège, Belgium
Mar 2025
3. California State University at Chico, USA
Jul 2024
4. Center for Mathematical Modelling, Santiago, Chile
Jan 2024
5. Pontificia Universidad Católica de Chile, Santiago, Chile
Dec 2023
6. MacEwan University, Edmonton, Canada
Aug 2023
7. Friedrich-Alexander-Universität, Erlangen, Germany
Jun 2023
8. Universidad Autonoma de San Luis Potosí, Mexico (online)
Nov 2022
9. MacEwan University, Edmonton, Canada
Sep 2022
10. Vassar College, New York, USA
Sep 2022
11. University of Birmingham, UK
May 2022
12. Open University, Milton Keynes, UK (online)
Sep 2020
13. *Informal Summer School in Substitutions and Aperiodic Order* (online)
Aug 2020
14. *SFB1283 Block Course on Lyapunov Exponents*, Bielefeld University
Jul 2019
15. University of Newcastle, Newcastle, NSW, Australia
Mar 2019
16. Ateneo de Manila University, Quezon City, Philippines
Oct 2018
17. Open University, Milton Keynes, UK
Aug 2018

Distinctions

1. International Union of Crystallography (IUCr) Award for Young Scientists, 15th International Conference on Quasicrystals, Tel Aviv, Israel
Jun 2023
2. Executive Dean's Commendation for Academic Excellence, Faculty of Science, Technology, Engineering, and Mathematics, The Open University, Milton Keynes, UK
Aug 2022
3. 2019 Best PhD Thesis for the Faculty of Mathematics, Bielefeld University
Prize: 1,000 €
Jan 2020
4. First Prize, Award for Outstanding Graduate Research for the School of Science and Engineering, Ateneo de Manila University, Philippines
Mar 2015

Third-Party Funding

1. Summer School Funding: "*Mini-Summer School in Aperiodic Order*" (with E. Korfanty, C. Ramsey, N. Strungaru), MacEwan University
Amount: 3,000 € from CRC1283 of the Germany Research Foundation (DFG)
25–26 Jul 2025
2. Workshop Funding, "*Algebra, Analysis, and Aperiodic Order*" (with D. Damanik und N. Strungaru), Bielefeld University
Amount: 31,000 € from CRC1283 and TRR358 of the (DFG)
12–16 Aug 2024
3. Postdoctoral Visiting Fellowship, Center for Mathematical Modelling (CMM), Santiago, Chile
Project Title: "*Extended Symmetries of Substitutive \mathbb{Z}^d -Dynamical Systems*" (PI)
Host: Sebastián Donoso
Amount: ca. 8,000 € for 3 Months
Nov 2023–Jan 2024
4. Grant Application, Emmy Noether Junior Research Group Programme, DFG
Project title: "*Continuous Spectrum in the Theory of Mathematical Quasicrystals*" (PI)
Decision: Not funded
2023
5. Mini-Workshop Funding, "*Extended Symmetries in Symbolic Dynamics*" (with Á. Bustos), Bielefeld University
18–19 Oct 2021
Amount: 3,000 € from CRC1283 of the DFG
6. Collaborative Involvement: Grant application for Project A6: *Random versus deterministic dynamical systems with aperiodic long-range order* within Collaborative Research Centre 1283 (CRC1283) at Bielefeld University, German Research Foundation (DFG), (funded from 2021–2025)
May 2021
7. DAAD Postdoctoral Researchers' International Mobility Experience (PRIME) Grant for a (12+6)-month postdoc at the Open University, Milton Keynes, UK and Bielefeld University
Project title: "*Renormalisation, Self-similarity, and Spectral Theory*" (PI)
Amount: Approx. 130,000 €
Feb 2020

Supervision, Conference Organisation, and Editorial Work

Thesis Supervision

1. Daniel Luz, PhD Mathematics, Bielefeld University
(co-supervised with M. Baake)
PhD Project: ALGEBRAIC AND SPECTRAL INVARIANTS OF HIGHER-DIMENSIONAL SHIFT SPACES
since Jan 2020
2. Ibai Aedo, PhD Mathematics, The Open University, Milton Keynes, UK
(co-supervised with U. Grimm, I. Short, R. Yassawi)
PhD Thesis: FORWARD LIMIT SETS OF SEMIGROUPS OF SUBSTITUTIONS AND MONOCHROMATIC ARITHMETIC PROGRESSIONS IN AUTOMATIC SEQUENCES
2023
3. Giovanni Benito Escolano, MSc Mathematics, Ateneo de Manila University, Philippines
(co-supervised with E. Miro)
MSc Thesis: COMBINATORIAL AND TOPOLOGICAL PROPERTIES OF A FAMILY OF RANDOM SUBSTITUTIONS
2020

Conference Organisation

1. Conference co-organiser (with D. Damanik, N.P. Frank, N. Strungaru, und R. Yassawi), *Directions in Aperiodic Order*, Banff International Research Station (BIRS), Banff, Canada
27 Jul–1 Aug 2025
2. Mini-summer school co-organiser (with E. Korfanty, C. Ramsey, N. Strungaru), *Mini-Summer School in Aperiodic Order*, MacEwan University, Edmonton, Canada
25–26 Jul 2025
3. Workshop co-organiser (with D. Damanik und N. Strungaru), *Algebra, Analysis, and Aperiodic Order*, Bielefeld
12–16 Aug 2024
4. Mini-workshop co-organiser (with D. Rust), *Arithmetic and Spectral Structures in Aperiodic Order*, Open University, Milton Keynes, UK
22–23 Sep 2022
5. Mini-workshop co-organiser (with Á. Bustos), *Extended Symmetries in Symbolic Dynamics*, Bielefeld
18–19 Oct 2021
6. Member, National Organising Committee, *Mathematical Society of the Philippines Annual Convention*, Paoay, Ilocos Norte, Philippines
18–19 May 2015
7. Member, National Organising Committee, *Department of Education K–12 National Training of Teachers for Grade 10 Mathematics*, Ateneo de Manila University, Philippines
13–24 Apr 2015

Refereeing and Editorial Work

1. Reviewer for *Ergodic Theory and Dynamical Systems*, *Discrete and Continuous Dynamical Systems*, *Proceedings of the American Mathematical Society*, *Israel Journal of Mathematics*, *Monatshefte für Mathematik*, *Indagationes Mathematicae*, *Houston Journal of Mathematics*, *Combinatorics and Number Theory*, *Journal of the Australian Mathematical Society*, *Discrete and Computational Geometry*, *Rocky Mountain Journal of Mathematics*.
2. Editor: *Aperiodic Order Volume 3: Model Sets and Dynamical Systems*
(with M. Baake und F. Gähler, *work in progress*)
3. Reporter for Meeting 2335: Oberwolfach Reports, *Aspects of Aperiodic Order*, 2023.

Thesis Examination

1. Basel Ammo, BSc Computer Science, Bielefeld University
INTEGER FACTORISATION OF LARGE NUMBERS WITH POLLARD-RHO AND DIXON'S METHODS 2024
2. Ioannis Charitos, BSc Computer Science, Bielefeld University
BREAKING BABY-AES WITH DIFFERENTIAL CRYPTANALYSIS 2024
3. Zachary Thomas Groth, BSc Mathematics (Honours), University of Newcastle, Australia
FRACTAL ASPECTS OF REGULAR SEQUENCES 2021
4. Daisy Romeo, PhD Mathematics, Ateneo de Manila University, Philippines
GENERALIZED WEYL QUANTIZATION, COHERENT STATE QUANTIZATION AND TIME IN QUANTUM MECHANICS 2021
5. Gwendolyn Tadeo, PhD Mathematics, Ateneo de Manila University, Philippines
MIXING OF RANDOM SUBSTITUTIONS 2019