

# Nishant Chandgotia

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## CONTACT INFORMATION

**Centre for Applicable Mathematics**  
Tata Institute of Fundamental Research,  
India.

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<https://nishantchandgotia.github.io/>

**RESEARCH INTERESTS** Ergodic Theory and Dynamical Systems, specifically, Symbolic Dynamics and related areas of Harmonic Analysis, Statistical Physics and Probability.

## CURRENT AFFILIATION

**Tata Institute of Fundamental Research**, Bangalore

Reader (Tenure-track position), since September, 2020.

## PREVIOUS AFFILIATIONS

**Einstein Institute of Mathematics**, Hebrew University of Jerusalem

Postdoctoral Fellow, October, 2018 - August, 2020

**School of Mathematical Sciences**, Tel Aviv University, Tel Aviv

Postdoctoral Fellow, June 2016 - September 2018

**ICERM**, Brown University,

Postdoctoral Fellow, February 2016 - May 2016

**School of Mathematical Sciences**, Tel Aviv University, Tel Aviv

Postdoctoral Fellow, October 2015 - January 2016

## EDUCATION

**University of British Columbia**, Vancouver

Ph.D., **Mathematics**, 2011 - 2015

- Advisor: **Dr. Brian Marcus**
- Area of Study: Symbolic Dynamics, Probability Theory

M.Sc., **Mathematics**, September 2009 - 2011

- Advisor: **Dr. Brian Marcus**
- Area of Study: Symbolic Dynamics, Probability Theory

**Indian Statistical Institute**, Bangalore

B.Math., 2006-2009

## PUBLICATIONS

- Large deviations for the 3D dimer model *with Scott Sheffield and Catherine Wolfram*  
*Arxiv:2304.08468; 2023*
- Borel factors and embeddings of systems in subshifts *with Spencer Unger*  
*Arxiv:2203.09359; Israel Journal of Math, 2023*
- Predictive Sets *with Benjamin Weiss*  
*Arxiv:1911.04935; Stochastics and Dynamics, 2020*
- Mixing properties of colorings of the  $\mathbb{Z}^d$  lattice *with Noga Alon, Raimundo Briceño, Alexander Magazinov and Yinon Spinka*  
*Arxiv:1903.11685; Combinatorics, Probability and Computing, 2020*
- Borel subsystems and ergodic universality for compact  $\mathbb{Z}^d$ -systems via specification and beyond *with Tom Meyerovitch*  
*Arxiv:1903.05716; Journal of London Mathematical Society, 2021*
- Delocalization of Uniform Graph Homomorphisms from  $\mathbb{Z}^2$  to  $\mathbb{Z}$  *with Ron Peled, Scott Sheffield and Martin Tassy*  
*Arxiv:1810.10124; Communications in Mathematical Physics, 2021*
- Kirszbraun-Type Theorems for Graphs *with Igor Pak and Martin Tassy*  
*Arxiv:1710.11007; Journal of Combinatorial Theory, Series B (2018)*
- Rational Ergodicity of Step Function Skew Products *with Jon Aaronson and Michael Bromberg*  
*Arxiv:1703.09003; Journal of Modern Dynamics, 13:1-42, (2018).*
- Mixing Properties for Hom-Shifts and the Distance between Walks on Associated Graphs *with Brian Marcus*  
*Arxiv:1607.08357; Pacific J. Math (2017), 294 (2018), no. 1, 41–69.*
- Four-Cycle Free Graphs, the Pivot Property and Entropy Minimality  
*Arxiv:1411.4029; Ergodic Theory Dynam. Systems 37 (2017), no. 4, 1102-1132.*
- A Generalisation of the Hammersley-Clifford Theorem on Bipartite Graphs  
*Arxiv:1406.1849; Trans. Amer. Math. Soc. 369 (2017), no. 10, 7107-7137.*
- Markov Random Fields, Markov Cocycles and the 3-coloured Chessboard *with Tom Meyerovitch*  
*Arxiv:1305.0808; Israel J. Math. 215.2 (2016): 909-964.*
- One Dimensional Markov Random Fields, Markov Chains and Topological Markov Fields *with Guangyue Han, Brian Marcus, Tom Meyerovitch and Ronnie Pavlov*  
*Arxiv:1112.4240; Proc. Amer. Math. Soc. 142 (2014), 227-242.*

## SELECTED TALKS AND PRESENTATIONS

- About dimer tilings in 3 dimensions  
*TIFR Mumbai, Ashoka University, Hebrew University of Jerusalem, Technion, Ben Gurion University in Be'er Sheva, the Fields Institute (2022) and the Bangalore Probability Seminar, (2023),*
- Some questions about tilings  
*TIFR-CAM Colloquium, 2022,*
- About Predictive Sets  
*MIT Probability Seminar, 2021,*
- About Riesz Sets  
*Analysis and Probability Research Group Seminar at the Indian Institute of Science, 2021,*

- Universality in tilings: Some old results and some new  
*Conference on Algebraic and Combinatorial Invariants of Subshifts and Tilings, 2021,*
- Uniqueness of clusters in percolation  
*Working Seminar in Dynamics at University of Utah, 2020,*
- Recent progress on tiling problems  
*Lunch seminar in dynamics, Hebrew University of Jerusalem, 2020,*
- How much do you need to know to know a process?  
*Expanding Dynamics Seminar V, 2020,*
- Predictive Sets  
*Expanding Dynamics Seminar III, Torun ETDS Seminar, Jagiellonian University ETDS Seminar, Universidad Autónoma de San Luis Potosí, 2020,*
- Domino tilings in higher dimensions  
*Massachusetts Institute of Technology, University of Fribourg, 2020.*
- Many questions and a few answers about hom-shifts and rectangular tiling shifts in higher dimensions.  
*In the "Symbolic Dynamical Systems" workshop in CMO, Mexico, 2019.*
- Modelling Processes on the  $\mathbb{Z}^d$ -lattice.  
*In Bar-Ilan University, Israel, 2018.*
- Some universal models for  $\mathbb{Z}^d$  actions.  
*At the Meeting on Infinite Ergodic Theory & Related Fields, Israel, 2018.*
- Hom-shifts and some associated problems.  
*At the University of Turku, Finland, 2018.*
- Irrational Rotations, Random Affine Transformations and the Central Limit Theorem  
*At the University of California in Los Angeles, the Weizmann Institute, Technion Institute of Technology, Tata Institute of Fundamental Research in Mumbai, Indian Institute of Technology in Mumbai, 2017.*
- Some Strange Universality Results among Hom-Shifts  
*At the Bangalore Probability Seminar, IISc, 2016.*
- Four Talks on Hom-Shifts  
*At the Transversal Aspects of Tilings, Oléron, 2016.*
- An Introduction to Hom-Shifts  
*At the Workshop on Dynamical Systems and Related Topics in the University of Maryland, College Park, 2016.*
- Distance between Walks on Graphs  
*At the Dartmouth College, the University of Denver, the University of Kansas and the Wright University, 2016.*
- Four Cycle Free Graphs and Entropy Minimality  
*At the Tel Aviv University, Tel Aviv, November, 2015.*
- Four Cycle Free Graphs and Entropy Minimality  
*At the Tata Institute of Fundamental Research, Mumbai, July, 2015.*
- Pivot Property for  $Hom(\mathbb{Z}^d, \mathcal{H})$   
*At the Workshop on Combinatorics and Applications, Shanghai, April, 2015.*
- Four-cycle Free Graphs and Entropy Minimality  
*At the Workshop on Symbolic Dynamics on Finitely Presented Groups, Santiago, December, 2014.*
- Graph Foldings and Markov Random Fields  
*At the Statistical and Mathematical Unit, Indian Statistical Institute, Kolkata, August, 2014.*
- Four-cycle Free Graphs and Entropy Minimality  
*At the Pingree Park Dynamics Workshop, July, 2014.*
- Four-cycle Free Graphs and Entropy Minimality  
*At the University of Victoria, March, 2014.*
- Graph Foldings and Markov Random Fields  
*At the Combinatorics Seminar in the Dartmouth College, February, 2014.*

- **Markov Random Fields and the 3-coloured Chessboard**  
*At the Symbolic Dynamics Special Session in the Mathematical Congress of the Americas, 2013.*
- **Markov Random Fields and the Pivot Property**  
*At the Indian Statistical Institute in Bangalore, July, 2013.*
- **Markov Random Fields, Markov Cocycles and the Pivot Property**  
*At the Automata Theory and Symbolic Dynamics Workshop in Vancouver, 2013.*

#### TEACHING EXPERIENCE

**Institute of Mathematics at the Jagiellonian University**, Poland.

A course in multidimensional symbolic dynamics  
2019.

**University of British Columbia**, Vancouver

Teaching Assistant - Tutor, Grader,  
September 2009- 2015.

Instructor for Math 105-209,  
Term 2, Winter Session, 2013.

#### AWARDS AND FELLOWSHIPS

- **Four Year Doctoral Fellowship**,  
*University of British Columbia, Vancouver, May, 2012- May-2015.*
- **Faculty of Science Graduate Fellowship**,  
*University of British Columbia, Vancouver, September, 2011- May 2012.*

#### REFERENCES

- **Dr. Brian Marcus** (Ph.D. Thesis Advisor),  
*University of British Columbia, Vancouver. (e-mail: marcus@math.ubc.ca )*
- **Dr. Jon Aaronson**,  
*Tel Aviv University, Israel. (e-mail: aaro@post.tau.ac.il )*
- **Dr. Tom Meyerovitch**,  
*Ben-Gurion University of the Negev, Israel. (e-mail: mtom@bgu.ac.il )*
- **Dr. Ronnie Pavlov**,  
*University of Denver, Denver. (e-mail: rpavlov@du.edu)*