Dzmitry Dudko

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Employment

Sept 2019–: Assistant Professor, Stony Brook University, USA

2016–2019: Postdoctoral Fellow, Jacobs University Bremen, Germany

Spring 2017, Spring 2018, Spring 2019: Visiting Professor, Stony Brook University, USA

2010–2016: Assistant (research fellow), G.-A.-Universität zu Göttingen, Germany

2008–2010: Stipendiary of the Research Training Group 1493, Deutsche Forschungsgemeinschaft, Germany

2006–2008: Stipendiary of Jacobs University Bremen, Germany

Education

2012: PhD in mathematics, Jacobs University Bremen, Germany
Title: *The Decoration Theorem of the Mandelbrot Set and Applications in Holomorphic Dynamics*

2007: University Diploma, Belarusian State University, Minsk, Belarus

Research Area

Dynamical Systems; in particular, the geometry of the Mandelbrot set and other parameter spaces, renormalization theory, post-critically finite maps, self-similar groups

Publications

Local connectivity of the Mandelbrot set at some satellite parameters of bounded type, with Mikhail Lyubich, *GAFA*, 33(4), 1–136, 2023

Algorithmic aspects of branched coverings III/V. Erasing maps, orbispaces, and the Birman exact sequence, with Laurent Bartholdi, *Groups, Geometry, and Dynamics* 15 (4), 1197–1265, 2021

Pacman renormalization and self-similarity of the Mandelbrot set near Siegel parameters, with Mikhail Lyubich and Nikita Selinger, *Journal of the AMS*, 33 (2020), 653-733

Algorithmic aspects of branched coverings IV/V. Expanding maps, with Laurent Bartholdi, *Transactions of the AMS*, 370, 7679–7714, 2018

Algorithmic aspects of branched coverings II/V. Sphere bisets and their decompositions, with Laurent Bartholdi, Inventiones Math., 223(1):1-100, 2021

Algorithmic aspects of branched coverings I. Van Kampen's Theorem for bisets, with Laurent Bartholdi, *Groups, Geometry, and Dynamics*, 12 (1), 121–172, 2018

Algorithmic aspects of branched coverings, with Laurent Bartholdi, *Ann. Fac. Sci. Toulouse* 26 (5), 1219–1296, 2017

Core entropy of quadratic polymonials, with Dierk Schleicher, *Arnold Mathematical Journal,* (2020) 6: 333-–385

Homeomorphisms between limbs of the Mandelbrot set, with Dierk Schleicher, *Proceedings of the AMS,* electr. published on Sept. 23, 2011

The decoration theorem for Mandelbrot and Multibrot sets, *International Mathematics Research Notices*, 13, 3985–4028, 2017

Preprints

MLC at Feigenbaum points, with Mikhail Lyubich,
available on `arXiv:2309.02107`, 2023

Uniform a priori bounds for neutral renormalization, with Mikhail Lyubich,
available on `arXiv:2210.09280`, 2022,

A canonical decomposition of postcritically finite rational maps and their maximal expanding quotients,
with Mikhail Hlushchanka and Dierk Schleicher, available on `arXiv:2209.02800`, 2022,

Matings with laminations, available on `arXiv:1112.4780v1`, 2011

Teaching

Spring 2023: Calculus C (MAT 127), course coordinator

Spring 2023: Applied Complex Analysis (MAT 342)

Fall 2022: Puzzles in Complex Dynamics (MAT 655)

Fall 2021: Calculus II (MAT 132), course coordinator

Fall 2021: Introduction to Linear Algebra (MAT 211)

Spring 2021: Ergodic Theory and Smooth Dynamics (MAT 555)

Fall 2020: Group Theory and Dynamical Systems (MAT 656)

Spring 2020: Applied Complex Analysis (MAT 342)

Fall 2019: Geometry for Teachers (MAT 515)

Spring 2019: Introduction to Linear Algebra (MAT 211)

Fall 2018: Algebraic Topology, Jacobs University Bremen

2012–2016: Teaching duties of a research assistant, University of Göttingen

PhD Students

Willie Rush Lim (current)
Jonathan Galvan Bermudez (current)

Service

2022 Chair Selection Committee

2021- University Senate, Stony Brook University

2019-21: Colloquium Committee, Stony Brook University

2019- IMS hiring committee

Referee: Journal of the AMS, Invent. Math., GAFA, Advances in Math., Trans. of the AMS, IMRN, Arnold Math. Journ.

PhD Committees: Timothy Alland (2023, Stony Brook), Matthew Dannenberg (2022, Stony Brook), Anastasia Shepelevtseva (2022, Pisa, Moscow), Sergey Shemyakov (2022, Marseille), InSung Park (2021, Bloomington), Konstantin Bogdanov (2020, Marseille)

Conferences and Programs Organized

Feb 3, 2020 – Mar 19, 2021: Semester Program *Renormalization and Universality in Conformal Geometry, Dynamics, Random Processes, and Field Theory*, Simons Center, Stony Brook University

Mar 5-7, 2021: Workshop *Many faces of renormalization*, Simons Center, Stony Brook University

Sep 21-24, 2021: Conference *Advancing Bridges in Complex Dynamics*, CIRM, Luminy, Marseille

Grants

PI for NSF-DMS 2055532, "Complex Dynamics: Renormalization, Geometry, and Algebra ", $287,991.00, June 1, 2021 – May 31, 2024 (Estimated),

Honors and Awards

- Gold Medal, International Mathematics Olympiad (IMO) 2002 (Glasgow, UK)
- First Prizes on International Mathematics Competition for Undergraduate Students (IMC) 2004–2006

Invited Talks (since 2019)

Conference *Parameter spaces in complex dynamics*, Pisa, May 2024

Conference *International Colloquium. Holomorphic and smooth dynamics.* Mumbai, January 2024

Workshop on Holomorphic Dynamics - MLC and tools for studying, Søminestationen Holbæk, October 20 – 22 2023

Conference *Inaugural CNAM-Fields Nonlinear Days: Renormalization and Friends,* Toronto, August 2023

Workshop *NSF-IRES: Advanced Studies Institute in Uzbekistan*, Uzbekistan, August 2023

Conference *Around the Mandelbrot set: celebrating the 60th birthday of Mitsuhiro Shishikura*, Kyoto, May-June 2023

Conference *Complex Dynamics in the Tropics: celebrating the* 60*th birthday of Carsten Lunde Peterson*, Rio de Janeiro, November 2022

Conference *On geometric complexity of Julia sets - IV*, Będlewo, August 2022

Colloquium in Saarland University, Germany, June 2022

Workshop *Adventurous Berkeley Complex Dynamics,* MSRI, May 2022

Introductory Workshop: Complex Dynamics - from special families to natural generalizations in one and several variables, MSRI, Feb. 2022

hybrid Conference *On geometric complexity of Julia sets - III*, Będlewo, Sep. 2021

hybrid Conference *Advancing Bridges in Complex Dynamics*, CIRM, Sep. 2021

Workshop *Many faces of renormalization*, Simons Center, March 2021

4-lecture minicourse on Renormalization Program, Simons Center, December 2020

Talk on the *Quasiworld seminar*, November, 2020

Workshop *Algorithms in Complex Dynamics and Mapping Class Groups*, ICERM, Brown University, Nov 2019

Seminar talk at University of Rhode Island, Oct, 2019

Conference *Analytic Low Dymensional Dynamics: a celebration of Misha Lyubich's 60th birthday*, Toronto, May-June, 2019

Dynamical Systems Special Session, *53rd Spring Topology and Dynamical Systems Conference*, University of Alabama at Birmingham, March, 2019

Visited places (with at least one contributed talk)

Urgench State University (Uzbekistan), IMPA (Rio de Janeiro, Brazil), RIMS in Kyoto (Japan), Chinese Academy of Sciences in Beijing (China), HES in Moscow (Russia), Banach conference center in Bedlevo (Poland), Vienna (Austria), University of Geneva (Switzerland), Uppsala University (Sweden), Søminestationen Holbæk, Copenhagen (Denmark), Saarland University, Jacobs University Bremen, University of Goettingen, Oberwolfach Research Institute (Germany), Paris, Toulouse (France), Barcelona (Spain), Fields Institute in Toronto (Canada), Harvard University, University of Chicago, Cornell University, Stony Brook University, Indiana University Bloomington, ICERM of Brown University, University of Alabama, Texas A&M University at College Station (USA)

Long Term Visits (a month or two)

Spring 2022: MSRI, CA

Spring 2013: IMS, Stony Brook University, NY

Spring 2012: ICREM, Brown University, Providence, semester program on "Complex and Arithmetic Dynamics"

Fall 2010: Chinese Academy of Sciences, Beijing, semester program on "Complex dynamics and related topics"