

Bogusława Karpińska

Address: Faculty of Mathematics and Information Science
Warsaw University of Technology
ul.Koszykowa 75
00-662 Warsaw
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Degrees

2016 Habilitation in Mathematics

Faculty of Mathematics and Information Science, Warsaw University of Technology,
Thesis: *Metric and topological properties of invariant sets in transcendental dynamics*

1999 PhD in Mathematics (with distinction)

Faculty of Mathematics and Information Science, Warsaw University of Technology,
Thesis: *Cantor bouquets for iteration of $\lambda \exp(z)$ and $\lambda \sin(z)$: Hausdorff dimension and Lebesgue measure.*

Advisor: Feliks Przytycki

1993 MSc in Mathematics (with distinction)

Faculty of Mathematics, Informatics and Mechanics, University of Warsaw,
Thesis: *Singular surfaces $z_1^p = z_2^2$ and their monodromy*

Advisor: Jerzy Jurkiewicz

Positions

- since 2018: Associate Professor
Faculty of Mathematics and Information Science, Warsaw University of Technology
- 2001-2016: Assistant Professor
Faculty of Mathematics and Information Science, Warsaw University of Technology
- 1993-2001: Teaching Assistant
Faculty of Mathematics and Information Science (Faculty of Technical Physics and Applied Mathematics until 1999), Warsaw University of Technology

Research interests

Dynamical systems, in particular iteration of holomorphic maps

Publications

- Bogusława Karpińska
Area and Hausdorff dimension of the set of accessible points of the Julia set of $\lambda \exp z$ and $\lambda \sin z$, Fund. Math. 159 (1999), 269–287
- Bogusława Karpińska
Hausdorff dimension of the hairs without endpoints for $\lambda \exp z$, C. R. Acad. Sci. Paris, 328, Serie I, (1999), 1039–1044
- Bogusława Karpińska
On the accessible points in the Julia sets of some entire functions
Fund. Math. 180 (2003), 89–98
- Bogusława Karpińska, Mariusz Urbański
How points escape to infinity under exponential maps
J. London Math.Soc. (2) 73 (2006), 141–156
- Krzysztof Barański, Bogusława Karpińska
Coding trees and boundaries of attracting basins for some entire maps
Nonlinearity 20 (2007), 391–415
- Krzysztof Barański, Bogusława Karpińska, Anna Zdunik
Hyperbolic dimension of Julia sets of meromorphic maps with logarithmic tracts
Int. Math. Res. Notices 2009, No.4 (2009), 615-624
- Walter Bergweiler, Bogusława Karpińska, Gwyneth Stallard
The growth rate of an entire function and the Hausdorff dimension of its Julia set
J. London Math. Soc. 80 (2009), 680- 698
- Krzysztof Barański, Bogusława Karpińska, Anna Zdunik
Dimension properties of the boundaries of exponential basins
Bull. London Math. Soc. 42 (2010), 210–220
- Walter Bergweiler, Bogusława Karpińska
On the Hausdorff dimension of the Julia set of a regularly growing entire function
Math. Proc. Cambridge Phil. Soc. 148 (2010), 531-551
- Krzysztof Barański, Bogusława Karpińska, Anna Zdunik
Bowen's formula for meromorphic functions
Ergod. Theory and Dynam. Sys. 32 (2012), 1165–1189
- Krzysztof Barański, Núria Fagella, Xavier Jarque, Bogusława Karpińska
On the connectivity of the Julia sets of meromorphic functions
Invent. Math. 198 (2014), 591-636

- Krzysztof Barański, Núria Fagella, Xavier Jarque, Bogusława Karpińska
Absorbing domains for holomorphic maps
J. London. Math. Soc. (2) 92 (2015), 144-162
- Krzysztof Barański, Núria Fagella, Xavier Jarque, Bogusława Karpińska
Accesses to infinity from Fatou components
Trans.Amer.Math.Soc. 369 (2017),1835-1867
- Krzysztof Barański, Núria Fagella, Xavier Jarque, Bogusława Karpińska
Connectivity of Julia sets of Newton maps: A unified approach
Rev. Mat. Iberoam. 34 (2018), no. 3, 1211–1228
- Krzysztof Barański, Bogusława Karpińska, Anna Zdunik
Conformal measures for meromorphic maps
Ann. Acad. Sci. Fenn. Math. 43 (2018), no. 1, 247–266
- Krzysztof Barański, Núria Fagella, Xavier Jarque, Bogusława Karpińska
Escaping points in the boundaries of Baker domains
J. Anal. Math. 137 (2019), no. 2, 679-706
- Krzysztof Barański, Núria Fagella, Xavier Jarque, Bogusława Karpińska
Fatou components and singularities of meromorphic functions
Proc. Roy. Soc. Edinburgh Sect. A. 150 (2020), no. 2, 633-654
- Krzysztof Barański, Bogusława Karpińska
On the dimension of points which escape to infinity at given rate under exponential iteration
Ergodic Theory Dynam. Systems, published online 2021

Conference talks

- 1998 *Hausdorff dimension of the set of accessible points of the Julia sets of $\lambda \exp z$*
Complex Dynamics and Hyperbolic Geometry, Banach Center, Warsaw, Poland
- 1998 *Area and Hausdorff dimension of the set of accessible points of the Julia sets of $\lambda \exp z$ and $\lambda \sin z$*
Conformal Geometry, Centre International de Rencontres Mathématiques
Marseille-Luminy, France
- 1999 *Hairs without endpoints for exponential maps*
Holomorphic Dynamics, Anogia, Greece
- 2004 *How points escape to infinity under the exponential maps*
Holomorphic Dynamics, University of Warwick, Great Britain

- 2007 *Coding trees in the boundaries of attracting basins for some entire maps*
Normal families and Complex Dynamics
Mathematisches Forschungsinstitut Oberwolfach, Germany
- 2007 *Coding trees in the boundaries of attracting basins for some entire maps*
Conformal Structures and Dynamics. The current state-of-art and perspectives.
University of Warwick, Great Britain
- 2007 *Accessible points in the boundaries of attracting basins for some entire maps*
First Joint International Meeting between the AMS and PTM, Warsaw, Poland
- 2007 *Cantor bouquets in the iteration of entire functions and Hausdorff dimension* (series of 3 talks)
Topics in Complex Dynamics, Universitat de Barcelona, Spain
- 2008 *Hausdorff dimension of the Julia set and growth rate of entire function*
Aspects of Transcendental Dynamics, Jacobs University Bremen, Germany
- 2009 *Hyperbolic dimension of Julia sets of meromorphic maps with logarithmic tracts*
Dynamical Systems, University of North Texas, Denton, USA
- 2009 *Dimension properties of the boundaries of exponential basins*
Conformal Structures and Dynamics. CODY - Third Year Conference.
Będlewo, Poland
- 2009 *The Hausdorff dimension of Julia sets of entire functions with regular growth*
The Escaping Set in Transcendental Dynamics
Mathematisches Forschungsinstitut Oberwolfach, Germany
- 2010 *Thermodynamic formalism for some meromorphic maps*
The 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, Germany
- 2010 *Pressure for non-hyperbolic meromorphic maps*
Transcendental Dynamics, Banach Center, Warszawa, Poland
- 2013 *Connectivity of Julia sets for meromorphic maps*
The role of complex analysis in complex dynamics
International Centre for Mathematical Sciences, Edinburgh, Great Britain
- 2013 *Pressure for meromorphic maps*
Workshop on Holomorphic Dynamics – Maps with essential singularities
Holbaek, Denmark
- 2015 *Absorbing domains for holomorphic maps*
2015 Joint Meeting AMS EMS SPM
University of Porto, Portugal

- 2015 *Thermodynamic formalism for transcendental maps*
Ergodic theory and holomorphic dynamics
Erwin Schrödinger International Institute for Mathematical Physics, Vienna, Austria
- 2017 *Fatou components and singularities of meromorphic functions*
Holomorphic Day 2017, Copenhagen, Denmark
- 2018 *Conformal measures for meromorphic maps*
On geometric complexity of Julia sets, Będlewo, Poland
- 2018 *Escaping points in the boundaries of Baker domains*
Resonances of complex dynamics
International Centre for Mathematical Sciences, Edinburgh, Great Britain
- 2018 *Pressure and conformal measures for meromorphic maps*
One Day Function Theory Meeting , London, Great Britain
- 2019 *Pressure and conformal measures for meromorphic maps*
Topics in Complex Dynamics, Universitat de Barcelona, Spain
- 2020 *Fatou components and singularities of meromorphic functions*
On geometric complexity of Julia sets II, Banach Center, Poland - online
- 2021 *Escaping points in the boundaries of Fatou components of transcendental maps*
London Mathematical Society Meeting on Holomorphic Dynamics - online
- 2021 *On the dimension of escaping sets for exponentials*
Topics in Complex Dynamics, Universitat de Barcelona, Spain - online

Selected seminar talks

- *Cantor bouquets for exponential maps*
Centre de Recerca Matemàtica, Barcelona, Spain, 1999,
- *Hausdorff dimension of the set of endpoints for $\exp(z)$*
Faculty of Mathematics and Computer Science of the Jagiellonian University, Kraków, 2003,
- *Cantor bouquets for complex exponentials*
Laboratoire de Probabilités, Université Paris VI, France, 2003,
- *How points escape to infinity under exponential maps?*
Institute of Mathematics, Polish Academy of Sciences, Warsaw, 2004,
- *Cantor bouquets for iteration of $\lambda \exp z$*
Department of Mathematical Methods in Physics, Faculty of Physics, University of Warsaw, Poland, 2005,

- *The growth rate of an entire function and the Hausdorff dimension of its Julia set*
Institute of Mathematics, Polish Academy of Sciences, Warsaw, 2008,
- *Hyperbolic dimension of Julia sets for entire maps in class \mathcal{B}*
Christian-Albrechts-Universität zu Kiel, Germany, 2008,
- *Hyperbolic dimension of Julia sets for meromorphic maps with logarithmic tracts*
Faculty of Mathematics and Computer Science of the Jagiellonian University, Kraków, Poland, 2011,
- *Hausdorff dimension of Julia sets of entire functions*
Universitat de Barcelona, Spain, 2011,
- *Absorbing domains for holomorphic maps*
Institute of Mathematics, Polish Academy of Sciences, Warsaw, 2013,
- *Accesses to infinity from Fatou components*, Institute of Mathematics, Polish Academy of Sciences, Warsaw, 2015,
- *Connectivity of the Julia sets of meromorphic functions and weakly repelling fixed points*
Faculty of Mathematics and Computer Science of the Jagiellonian University, Kraków, Poland, 2016,
- *On the dimension of escaping sets for exponentials*
Universitat de Barcelona, Spain, 2020,

Research visits

- Centre de Recerca Matemàtica, Barcelona, Spain (March 1999)
- Laboratoire de Probabilités, Université Paris VI, France (May 2003)
- Institut Henri Poincaré, Paris, France (October 2003)
- Christian-Albrechts-Universität zu Kiel, Germany (November 2008)
- Universitat de Barcelona, Spain (September 2011),
- Universitat de Barcelona, Spain (June 2014)
- Universitat de Barcelona, Spain (September 2014)
- Universitat de Barcelona, Spain (April 2015)
- Universitat de Barcelona, Spain (November 2015)
- Universitat de Barcelona, Spain (May 2016)

- Centro Internazionale per la Ricerca Matematica, Trento, Italy (November 2016)
- Universitat de Barcelona, Spain (January 2018)
- Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy (July 2019)

Research projects

- Polish KBN Grant *Iterations of holomorphic functions II* (1999-2002), investigator
- Polish KBN Grant *Conformal dynamical systems and geometry of fractal sets* (2003-2006), investigator
- Polish Ministry of Science Grant *Geometric and ergodic properties of dynamical systems* (2007-2010), investigator
- EU Research Training Network *CODY Conformal Structures and Dynamics* (2007-2010), investigator
- Polish Ministry of Science Grant *Geometric and ergodic properties of dynamical systems* (2011-2014), investigator
- Polish National Science Centre Grant *Topological properties of invariant sets in transcendental dynamics* (2013-2016), investigator
- Polish National Science Centre Grant *Stochastic Methods in the theory of smooth dynamical systems* (2015-2018), investigator
- Polish National Science Centre Grant *Deterministic and Random Phenomena in Dynamical Systems* (2019-2022), investigator

Administration

- since 2016: Vice-Dean for Student Affairs
Faculty of Mathematics and Information Science, Warsaw University of Technology

Awards

- Prize of the Rector of the Warsaw University of Technology for scientific research: 2011, 2016, 2019, 2021
- Złota Kreda (awards for the best lecturers at Warsaw University of Technology) : 2013, 2015, 2018, 2019, 2021.