

Current position

ASSISTANT PROFESSOR (Polish: “ADIUNKT”)
POSTDOCTORAL RESEARCHER AND INSTRUCTOR
Wrocław University of Science and Technology (PWr)

October 2020 - present

Previous position

POSTDOCTORAL RESEARCHER
Institute of Mathematics, Polish Academy of Sciences (IMPAN) October 2018 - September 2020

Education

PH.D. IN MATHEMATICS
The Pennsylvania State University May 2018
Thesis: “Boundary maps and their natural extensions associated to Fuchsian and Kleinian groups.”
Committee: Svetlana Katok (chair), Anatole Katok, Federico Rodríguez Hertz, Kyusun Choi
B.S. WITH HONORS IN MATHEMATICS, Computer Science concentration May 2011
The Pennsylvania State University

Recent papers

Interests: Dynamical systems (symbolic dynamics and ergodic theory), continued fractions, geodesic flow, entropy, normality.

A. Abrams, S. Katok, I. Ugarcovici. “On the topological entropy of (a, b) -continued fraction transformations.” *Nonlinearity* **36** (2023) no. 5, 2894–2908. [arXiv:2210.07389](#)

A. Abrams, T. Downarowicz. “Destruction of CPE-normality along deterministic sequences.” [arXiv:2202.02662](#)

A. Abrams, S. Katok, I. Ugarcovici. “Rigidity and flexibility of entropies of boundary maps associated to Fuchsian groups.” *Math. Research Reports.* **3** (2022) 1–19. [arXiv:2106.13779](#)

A. Abrams, S. Katok, I. Ugarcovici. “Rigidity of topological entropy...” To appear in *A Vision For Dynamics in the 21st Century*, Cambridge University Press. [arXiv:2101.10271](#)

A. Abrams, S. Katok, I. Ugarcovici. “Flexibility of measure-theoretic entropy of boundary maps....” *Ergodic Theory and Dynamical Systems* **42** (2022) 389–401. [arXiv:1909.07032](#)

A. Abrams. “Extremal parameters and their duals for boundary maps associated to Fuchsian groups.” *Illinois Journal of Mathematics* **65** (2021) 153–179. [arXiv:2001.11943](#)

A. Abrams. “Finite partitions for several complex continued fraction algorithms.” *Experimental Mathematics* (2020) 1–18. [arXiv:1911.01999](#)

Teaching

INSTRUCTOR (ADIUNKT), Wrocław University of Science and Technology
Analysis I (MAT 1648, 1653) Winter 2021, 2022
Analysis II (MAT 1510, 1649, 1690) Summer 2021, 2022
Linear Algebra and Geometry (MAT 1433, 1654, 1688) Winter 2020, 2021, 2022
• Lectured and taught interactive problem sessions for Polish and international students.

PRIVATE TUTOR

Introductory Calculus

Fall 2015 - Spring 2016

- Tutored individual enrolled in online calculus course focusing on reasoning and applications.

INSTRUCTOR (GTA), Pennsylvania State University

Multivariable Calculus (MATH 230, 231)

Fall 2012, Fall 2013 - 2015

Intro Logic and Probability (MATH 17)

Spring 2013

- Taught approximately 250 students total, held weekly office hours, designed homework assignments and quizzes, graded exams.

INSTRUCTOR, Johns Hopkins Center for Talented Youth

Paradoxes and Infinities (PDOX)

Summer 2013, 2014, 2015

- Developed curriculum for recently-created summer course, supervised a teaching assistant, taught middle- and high-school students.

TEACHING ASSISTANT (GTA), Pennsylvania State University

Business Calculus (110) and *Honors PMASS Real Analysis* (312H)

Spring - Fall 2012

- Ran weekly recitation sessions, held office hours, graded student homework and exams.

TEACHING ASSISTANT, Johns Hopkins Center for Talented Youth

Cryptology (CODE) and *Advanced Cryptology* (COD2)

Summer 2010, 2011, 2012

- Supervised middle- and high-school students in residential summer course, ran nightly recitation sessions, supported primary instructor.

Selected talks

“Entropy locking with (a, b) -continued fraction maps”

August 2022

Pennsylvania State University

“Destruction of CF-normality under deterministic sampling”

December 2021

Wroclaw University of Science and Technology (online)

“Rigidity of entropy for Fuchsian boundary maps”

September 2021

Tata Institute, Mumbai (online)

“Explicit constructions for multiplicative normality”

October 2020

University of Chile (online)

“Flexibility of entropy for Fuchsian boundary maps”

August 2019

Będlewo Conference Center

“Dual codes for extremal parameters of Fuchsian boundary maps”

June 2019

Jagiellonian University, Krakow

“Coding of geodesic flow on surfaces of constant negative curvature”

October 2018

IMPAN Dynamical Systems Seminar, Warsaw

“Dynamical systems from complex continued fractions”

April 2017

Maryland Workshop on Dynamical Systems

Honors and awards

CHARLES H. HOOVER MEMORIAL AWARD

April 2015

- Presented to at most two mathematics graduate students per year for exemplary teaching.

DEPARTMENTAL TEACHING AWARD

December 2013

- Recognizes graduate students in Penn State's Department of Mathematics for outstanding teaching of undergraduates.

SCHREYER ACADEMIC EXCELLENCE SCHOLAR

Fall 2007 - Spring 2011

- Merit scholarship. Access to enrichment courses, research placement, and dedicated housing. Program accepts at most 300 incoming students out of approximately 20,000.

MATHEMATICS ADVANCED STUDY SEMESTERS (MASS) FELLOW

Fall 2009

- Merit scholarship. Enrollment in special-topics advanced mathematics courses.
- Personally awarded "best research projects" in two courses.

Additional experience

Journal reviewer: *Experimental Mathematics*; *Topological Methods in Nonlinear Analysis*.

Programming: Python, Java, PHP, SQL, JavaScript, CSS, L^AT_EX, TikZ, Mathematica.

EDITORIAL ASSISTANT, Math. Research Reports (Centre Mersenne)

Summer 2021 - present

EDITORIAL ASSISTANT, Journal of Modern Dynamics (AIMS)

Spring 2013 - present

- Proofread announcements and full-length papers for grammar, spelling, general formatting, and journal-specific formatting requirements. Also manage references in BiB_TE_X.

CO-ORGANIZER, IMPAN Young Researchers Colloquium

Fall 2018 - Summer 2020

- Coordinated presentations by graduate students and postdoctoral scholars in mathematics.

CO-FOUNDER AND ORGANIZER, PSU Student-directed Colloquium

Fall 2017 - Spring 2018

- Created a seminar for talks by mathematics graduate students for graduate/postdoc audience.

PYTHON DEVELOPER, AllSet Learning and Mandarin Companion

August 2016 - May 2018

- Automated creation of Chinese storybooks and grammar textbooks; maintained and expanded code for eBook creation.

DATABASE LEAD, Penn State Dance Marathon Tech. Committee

Spring 2008 - 2011

- Designed website using PHP and JavaScript, developed MySQL applications for online database with 3600 users, supervised a team of other developers, administered server.

FOUNDER AND PRESIDENT, Penn State Quiz Bowl

Spring 2008 - 2010

- Established official organization for Penn State students interested in academic competitions.
- Organized and hosted tournaments for high school and college students.

MEMBER, District Elementary Math Curriculum Committee

April 2010 - June 2011

- Researched curricula and educational philosophies for local primary/secondary schools, developed and applied rubric, interpreted data, and met with publisher representatives.