Balázs Strenner

Contact Information

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Research Interests

Low-dimensional topology, mapping class groups, pseudo-Anosov homeomorphisms, curve and arc complexes, 3-manifolds, branched coverings of spheres.

Positions

Hale Visiting Assistant Professor, Georgia Tech (2016-2019)

Member, Institute for Advanced Study (2015-2016)

Education

University of Wisconsin, Madison
Ph.D. in Mathematics, 2015. Advisor: Autumn Kent.

Eötvös Loránd University, Budapest, Hungary
Masters in Mathematics (with honors), 2010.

Awards, prizes, grants

Mary Ellen Rudin Award · Elsevier's annual award for young topologists. ($15000, 2018)

AMS-Simons Travel Grant ($4000, 2016–2018)

Excellence in Research Award, University of Wisconsin, Madison (2014)

Scholarship of the Republic of Hungary (2007, 2008, 2009)

International Math. Competition (2006, 2007, 2008, 2009: 1^{st} Prize)

Miklós Schweitzer Competition (2008, 2009: 1^{st}, 2006, 2007: Honorable Mention)

International Mathematical Olympiad (2005: Gold Medal)

Publications

11 *Fast Nielsen–Thurston Classification* (with D. Margalit and Ö. Yurttaş)
(in preparation)

10 *Fibrations of 3-manifolds and asymptotic translation length in the arc complex*
arXiv:1810.07236

9 *Minimal Penner dilatations on nonorientable surfaces* (with L. Liechti)
arXiv:1807.08940

8 *Minimal pseudo-Anosov stretch factors on nonorientable surfaces* (with L. Liechti)
arXiv:1806.00033

7 *The Arnoux-Yoccoz mapping classes via Penner's construction* (with L. Liechti)
arXiv:1805.01248

6 *Lifts of pseudo-Anosov homeomorphisms of nonorientable surfaces have vanishing SAF invariant*
Math. Res. Lett. 25 (2018), no. 2, 677–685.

5 *Galois conjugates of pseudo-Anosov stretch factors are dense in the complex plane*
International Mathematics Research Notices (2017).

4 *Algebraic degrees of pseudo-Anosov stretch factors*
Geom. Funct. Anal. 27 (2017), no. 6, 1497–1539.

3 *Pseudo-Anosov mapping classes not arising from Penner's construction* (with H. Shin)
Geometry & Topology 19 (2015), no. 6, 3645-3656.

2 *How large dimension guarantees a given angle?* (with V. Harangi, T. Keleti, G. Kiss, P. Maga, A. Máthé, P. Mattila)
Monatshefte für Mathematik, 2013, Volume 171, Issue 2, pp 169-187.

1 *n-pont halmazok a síkban (n-point sets in the plane)*
Mat. Lapok (N.S.) 16 (2010), no. 3, 16–43

Mentoring

Project: *Change of Dehn–Thurston train tracks under elementary moves of pants decompositions.*
Program: Research Program for Undergraduates, Georgia Tech, June-July 2017.
Mentees: Ian Katz (graduate), Yandi Wu (undergraduate), Yihan Zhou (undergraduate).

Project: *Implementing algorithms for mapping class groups*, Georgia Tech, Fall 2017.
Mentees: Jonathan Chen, Shreyas Casturi, Vignesh Raman, Kyle Xiao (undergraduates).

Project: *Stretch factors of polynomials.*
Program: Research Program for Undergraduates, Georgia Tech, June-July 2018.
Mentees: Agniva Roy (graduate), Jacob Shulkin (undergraduate), Logan White (undergraduate).

Speaking

39 *Fibrations of 3-manifolds and nowhere continuous functions*—Geometric Topology Seminar · Columbia · October 2018

38 *Fibrations of 3-manifolds and nowhere continuous functions*—Teichmüller dynamics, mapping class groups and applications · Grenoble · June 2018

37 *Fast Nielsen-Thurston classification*—Geometry of Teichmüller space and mapping class groups · Warwick · April 2018

36 *Fibrations of 3-manifolds and nowhere continuous functions*—Spring Topology and Dynamics Conference · Auburn, Alabama · March 2018

35 *Number-theoretic aspects of surface homeomorphisms*—Spring Topology and Dynamics Conference · Auburn, Alabama · March 2018

34 *Fibrations of 3-manifolds, tilings and nowhere continuous functions*—Tech Topology Conference · Georgia Tech · December 2017

33 *Fast Nielsen-Thurston classification (5-minute lightning talk)*—No Boundaries: Groups in Algebra, Geometry, and Topology · University of Chicago · October 2017

32 *How to stretch taffy most efficiently?*—Research Horizon Seminar · Georgia Tech · September 2017

31 *Fast computation in mapping class groups*—Mathematical Congress of the Americas · Montréal · July 2017

30 *Fast Nielsen-Thurston classification (5-minute lightning talk)*—Braids in algebra, geometry and topology · ICMS, Edinburgh · May 2017

29 *Fast computation in mapping class groups*—Shanks Conference in low-dimensional topology · Vanderbilt · May 2017

28 *Fast computation in mapping class groups*—Geometric Topology Fair · KAIST · May 2017

27 *Number-theoretic aspects of surface homeomorphisms*—Colloqium · Alabama–Birmingham · April 2017

26 *Fast Nielsen–Thurston classification*—Spring Topology and Dynamics Conference · New Jersey City University · March 2017

25 *Number-theoretic aspects of surface homeomorphisms*—Surface Bundles · Oberwolfach · December 2016

24 *Algebraic degrees of pseudo-Anosov stretch factors*—Geometry Topology Seminar · Georgia Tech · October 2016

23 *Penner's conjecture*—G&T Student Seminar · Georgia Tech · September 2016

22 *Algebraic degrees of pseudo-Anosov stretch factors*—Topology and Geometric Group Theory Seminar · Cornell · May 2016

21 *Algebraic degrees of pseudo-Anosov stretch factors*—Geometric Analysis and Topology Seminar · Courant Institute · April 2016

20 *Algebraic degrees of pseudo-Anosov stretch factors*—Ergodic Theory Seminar · Princeton · April 2016

19 *Algebraic degrees of pseudo-Anosov stretch factors*—Topology Seminar · Stony Brook · April 2016

18 *Algebraic degrees of pseudo-Anosov stretch factors*—Topology/Geometry Seminar · Rutgers · January 2016

17 *Construction of pseudo-Anosov maps and a conjecture of Penner*—Wasatch Topology Conference · Salt Lake City, Utah · December 2015

16 *Penner's conjecture (5-minute lightning talk)*—Tech Topology Conference · Georgia Tech · December 2015

15 *Construction of pseudo-Anosov maps and a conjecture of Penner*—Math Colloqium · Rutgers-Newark · November 2015

14 *Pseudo-Anosov constructions and Penner's conjecture*—3-manifold seminar · IAS · November 2015

13 *Construction of pseudo-Anosov maps and a conjecture of Penner*—Geometry and Topology Seminar · CUNY · November 2015

12 *Construction of pseudo-Anosov maps and a conjecture of Penner*—Geometry–Topology Seminar · Temple · October 2015

11 *Construction of pseudo-Anosov maps and a conjecture of Penner*—Geometry & Topology Seminar · Yale · October 2015

10 *Pseudo-Anosov stretch factors*—Postdoc talks series · Institute for Advanced Study · September 2015

9 *Algebraic degrees of pseudo-Anosov stretch factors*—Geometric Topology Seminar · Columbia · September 2015

8 *Algebraic degrees and Galois conjugates of pseudo-Anosov stretch factors*—Annual Spring Topology and Dynamics Conference · Bowling Green State University · May 2015

7 *Pseudo-Anosov mapping classes not arising from Penner's construction*—Cascade Topology Seminar · University of Victoria, Canada · April 2015

6 *Pseudo-Anosov mapping classes not arising from Penner's construction*—AMS Special Session on Geometric Group Theory and Topology · University of Alabama in Huntsville · March 2015

5 *Algebraic degrees of pseudo-Anosov stretch factors*—Arkansas Spring Lecture Series · University of Arkansas · March 2015

4 *Penner's conjecture on pseudo-Anosov mapping classes*—Topology Seminar · UW-Madison · January 2015

3 *On a conjecture of Penner*—Geometry Topology Seminar · Georgia Tech · October 2014

2 *Pseudo-Anosov maps arising from Penner's construction*—Geometry of Groups and Dynamics/GEAR Seminar · UIUC · September 2014

1 *Small dilatation pseudo-Anosovs on non-orientable surfaces*—Topology Student Workshop · Georgia Tech · June 2014

Memberships

American Mathematical Society

Refereeing

AMS Mathematical Reviews
Algebraic & Geometric Topology
Proceedings of the AMS
Geometry & Topology
JP Journal of Geometry and Topology
Groups, Geometry, and Dynamics
Journal of Topology & Analysis

Teaching

Spring 2019 · Topics course—Geometric structures on surfaces · Georgia Tech

Fall 2018 · Math 1551—Calculus I · Georgia Tech

Spring 2018 · Math 1553—Linear algebra · Georgia Tech

Spring 2017 · Math 1553—Linear algebra · Georgia Tech

Fall 2016 · Math 1553—Linear algebra · Georgia Tech

Summer 2015 · Teaching Assistant: Math 320—Linear Algebra and Differential Equations · UW–Madison

Fall 2014 · Math 132—Algebra, Probability and Statistics · UW–Madison

Spring 2014 · Math 132—Algebra, Probability and Statistics · UW–Madison

Fall 2013 · Teaching Assistant: Math 222—Calculus II · UW–Madison

Summer 2013 · Math 114—Algebra and trigonometry · UW–Madison

Spring 2012 · Math 112—Algebra · UW–Madison

Summer 2012 · Analysis SEP—Qual preparation course · UW–Madison

Summer 2011 · Analysis SEP— Qual preparation course · UW–Madison

Fall 2012 · Teaching Assistant: Math 319—Ordinary Differential Equations · UW–Madison

Spring 2012 · Teaching Assistant: Math 221—Calculus I · UW–Madison

Fall 2011 · Teaching Assistant: Math 222—Calculus II · UW–Madison

Spring 2011 · Teaching Assistant: Math 221—Calculus I · UW–Madison

Fall 2010 · Teaching Assistant: Math 222—Calculus II · UW–Madison

Spring 2008 · Teaching Assistant—Discrete Mathematics · Eötvös Loránd University

Teaching Awards

Softball Professor Appreciation, Georgia Tech, 2017 Spring
Capstone Ph.D. Teaching TA Award, UW-Madison, 2014 December
Campus-wide L&S Teaching Fellow Alternate, UW-Madison, 2014 April
Department of Mathematics Teaching Award, UW-Madison, 2013 May
University Housing Honored Instructor Recognition, UW-Madison (2011, 2012, 2013)

Languages

Hungarian (mother tongue), English (fluent), French (basic)

Miscellaneous activities

Volunteer at High School Math Competition, Georgia Tech, 2017 April, 2018 March
Poster judge: 12th Annual Undergraduate Research Spring Symposium, Georgia Tech, 2017 April, 2018 April
Organizer of Sidewalk Math (1-day tutoring event during final exams), UW-Madison, 2013 May
Volunteer Math Tutor for GUTS (Greater Univ. Tutorial Service), UW-Madison, 2012
Preparation Assistant of the Hungarian IMO team, Budapest, Hungary, 2006-2009
Grader of the correspondence competition of KöMaL (Mathematical and Physical Journal for Secondary Schools), Budapest, Hungary, 2005-2009
Coordinator at the 47th IMO, Portoroz, Slovenia, 2006 July