

Curriculum Vitae

Jacob A. Siehler

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Education

2003	PhD	Mathematics	Virginia Tech	Blacksburg, VA
		Thesis: <i>Near-group Categories</i> , Advisor: Frank Quinn		
2001	MS	Mathematics	Virginia Tech	Blacksburg, VA
1997	BS	Computer Science	Frostburg St. University	Frostburg, MD
1997	BS	Mathematics	Frostburg St. University	Frostburg, MD
1996		Budapest Semesters in Mathematics		

Research Interests

Braided categories and low-dimensional topology, representations of finite groups, enumerative combinatorics and recreational mathematics.

Academic Employment

- Assistant Professor, Gustavus Adolphus College, September 2015-
- Mathematics Specialist, Fairfield Elementary School, 2014-2015
- Instructor, [Summer Program in Mathematical Problem Solving](#), July 2014
- Mathematics Enrichment Teacher, Rockbridge County Public Schools, 2012-2014
- Associate Professor, Washington & Lee University, 2012
- Assistant Professor, Washington & Lee University, 2003-2012
- Graduate Research/Teaching Assistant, Virginia Tech. (supported by NSF) 1999-2003

Awards

- George Pólya Award, 2013 (awarded by the MAA for *The Finite Lamplighter Groups: A Guided Tour*)

Thesis Advising

- *Rotation Remainders*, by Jameson Graber (Washington & Lee Honors in Mathematics Thesis, 2008)
[arXiv:1409.4113](#) [math.NT]

Publications & Preprints

- *Braided Near-Group Categories*, preprint, [arXiv:math/0011037](#) [math.QA].
- *Near-group categories*, Algebraic & Geometric Topology 3 (2003), pp 719-775.
- *Operads in iterated monoidal categories*, (with Stefan Forcey and Seth Sowers), Journal of Homotopy and Related Structures 2 (2007), pp 1-43.
- *How Long Until A Random Sequence Decreases?* Mathematics Magazine 83 (2010), pp 374-379.
- *Port-and-Sweep Solitaire*, Math Horizons 18 (2010), pp 22-25
- *Depth and Symmetry in Conway's M13 Puzzle*, Mathematics Magazine 84 (2011), pp 243-256.
- *The Finite Lamplighter Groups: A Guided Tour*, College Mathematics Journal 43 (2012), pp 203-211.
- *Tiling Hamiltonian Cycles on the 24-Cell*, The American Math. Monthly 119 (2012), pp 872-875.
- *Slide-and-Swap Permutation Groups* (with Onyebuchi Ekenta and Han Gil Jang), Involve, a Journal of Mathematics 7-1 (2014), pp 41-55.
- *Selections without Adjacency on a Rectangular Grid*, preprint, [arXiv:1409.3869](#) [math.CO]
- *How Many Unicycles on a Wheel* (to appear in Mathematics Magazine, February 2019)
- *XOR Magic Graphs* (submitted Sep 2018, under consideration at *Recreational Mathematics Magazine*)
- *Tricolor Pyramids* (submitted Jan 2019, under consideration at *Math Horizons*)

Undergraduate Courses Taught

- Calculus, Multivariable Calculus
- Discrete Math I and II
- Intro to Probability & Statistics
- Linear Algebra
- Fundamental Concepts of Mathematics (Proofs for beginning math majors)
- Abstract Algebra I and II
- Discrete Calculus
- General Topology
- Differential Topology
- Knots, Links and Braids
- Numerical Analysis
- Category Theory (Independent Study)
- Design and Analysis of Mathematical Games (Independent Study)
- Cryptography
- Error-Correcting Codes
- Algorithms (for Comp. Sci.)
- Intro. Combinatorics (Independent Study)

Selected Wolfram Demonstrations

- Sliding Block Puzzles (<https://demonstrations.wolfram.com/SlidingBlockPuzzles/>)
- Problems in Peg Solitaire (<http://demonstrations.wolfram.com/ProblemsInPegSolitaire/>)
- Slide and Swap on Cubic Graphs (<http://demonstrations.wolfram.com/SlideAndSwapOnCubicGraphs/>)
- Conway's M(13) Puzzle (<http://demonstrations.wolfram.com/ConwaysM13Puzzle/>)
- The Hamming (7,4) Code (<http://demonstrations.wolfram.com/TheHamming74Code/>)

Selected Talks & Presentations

- *Knot and Link Invariants from Braided Categories*, VT Visitors' Day Colloquium, March 2003.
- *Near-Group Categories*, University of Warwick Workshop on Quantum Topology. March 2002.
- *Monoidal and Braided structures in Near-Group Categories*, AMS Special Session on Quantum Topology. September 2001
- *Caegories with Multiple Monoidal Structures*, invited seminar talk, Tenn. State U., February 2006
- *Caegories with Multiple Monoidal Structures*, invited seminar talk, U. Georgia, February 2007
- *Calculus, Dice, and Proabiliteeeeeee...*, invited lecture, Frostburg St. U., Nov. 2007
- *Crackerbarrel, Cube Roots, Finite Fields, and What Computes?*, invited talk, Virginia Tech Apr 2010
- *John Milnor, Abel Prize Laureate*, invited talk, Washington & Lee University Nov 2011
- *Around the World with W. R. Hamilton*, Pi Mu Epsilon Induction lecture, W&L Mar 2012
- *Tiling Hamiltonian Cycles on the 24-Cell*, AMS Special Session on Polytopes, October 2012
- *Wheel Graphs and Spanning Unicyclic Subgraphs*, St. Olaf colloquium, October 2017
- *Fractional Bases and The Cake That Never Comes*, Gustavus colloquium, April 2018

Language Skills

- Hungarian (approximately B2 CEFR level, reading/writing/speaking)
- German (approximately B2, with a Goethe Institut certificate, 2018, at the B1 level)
- Russian (primarily for literature and technical reading)

Selected Computer Skills

- *Mathematica* (for research, demonstrations, and classroom use)
- *Microsoft Excel* (with an emphasis on classroom use)
- Objective C (with Cocoa), C and C++
- Python
- JavaScript, Processing, and p5.js
- Unix shell tools, Perl, any kind of text manipulation or "data wrangling"