

Education

Expected	PhD Mathematics - Arizona State University
May 2019	<i>Lattices and thin subgroups of complex hyperbolic isometries.</i> Advisor: Dr. Julien Paupert
May 2016	MA Mathematics - Arizona State University
May 2013	BS Mathematics - Arizona State University

Research Interests

My research interests are in low-dimensional topology, hyperbolic geometry, and geometric group theory. My dissertation research under the guidance of Dr. Julien Paupert is aimed at finding a complex hyperbolic analogue to the hybrid lattice construction produced by Gromov and Piatetsky-Shapiro.

Teaching Experience

Aug 2013 - Current	Arizona State University, Tempe, AZ 85281 <i>Teaching Assistant</i> Courses Graded: <ul style="list-style-type: none">• Mathematical Structures (Fall 2013).• Introduction to Geometry (Spring 2014-2015). Courses Assisted: <ul style="list-style-type: none">• Calculus with Analytic Geometry I (Fall 2013).• Calculus with Analytic Geometry II (Spring/Fall 2014).• Calculus with Analytic Geometry III (Spring 2015).• Geometry and Topology of Manifolds I (Fall 2015,2016).• Geometry and Topology of Manifolds II (Spring 2017). Courses Taught: <ul style="list-style-type: none">• Calculus for Engineering II (Summer 2016, Fall 2017, Spring 2018, Fall 2018). Honors projects:<ul style="list-style-type: none">– “Calculus Throughout History” by Katerina Liong (Fall 2017)– “Differential Equations” by Roman DeCaro (Fall 2018)– “Hyperbolic Trigonometric Functions” by Tabitha Keever (Fall 2018)• Calculus for Engineering I (Spring 2016).• Precalculus (Summer 2015).
-------------------------------	--

Non-Teaching Experience

May 2017 - Air Force Research Labs, Wright State University, Dayton, OH 45435
Aug 2017 *ATR Center Research Intern*
Information geometry and applying techniques from Riemannian geometry to covariance estimation.

Awards

- Outstanding Teaching Assistant (Spring 2018)

Publications and Preprints

The documents below are available on my webpage: joseph-wells.com/research.php

- *Nonarithmetic hybrids in $PU(2, 1)$* . In preparation. October 2018.
- (with J. Paupert) *Hybrid lattices and thin subgroups of Picard modular groups*. Submitted. eprint arXiv:1806.01438. June 2018.
- (with M. Cook, K. Cameron, B. Robinson) *Fisher-Rao distances on the covariance cone*. Preprint. March 2018.

Talks and Presentations

Future

- *Joint Math Meetings* at Baltimore. *AMS Special Session on Geometry and Dynamics of Continued Fractions*. Talk: “Hybrid subgroups of lattices in $PU(2, 1)$.” January 16 - 19, 2018.
- *Texas Geometry and Topology Conference* at Rice University. Poster: “Hybrid subgroups of lattices in $PU(2, 1)$.” November 9 - 11, 2018.
- *Differential Geometry Seminar* at Arizona State University. Talk: “Hybrid subgroups of lattices in $PU(2, 1)$.” October 19, 2018.

Past

- *Graduate Student Seminar* at Arizona State University. Talk: “Continued fractions and the Heisenberg group.” October 2, 2018.
- *Graduate Student Seminar* at Arizona State University. Talk: “Surface automorphisms.” February 6, 2018.
- *Differential Geometry Seminar* at Arizona State University. Talk: “Discrete subgroups of complex hyperbolic isometries.” November 03, 2017.
- *Graduate Student Seminar* at Arizona State University. Talk: “Complex hyperbolic lattices.” September 20, 2017.
- *Differential Geometry Seminar* at Arizona State University. Talk: “A short introduction to $CAT(0)$ cube complexes.” April 14, 2017.
- *Candidacy Advancement* at Arizona State University. Talk: “Discrete subgroups of complex hyperbolic isometries.” November 21, 2016.

- *Topology Students Workshop* at Georgia Institute of Technology. Short talk: “A geometric construction of thin subgroups of $SU(2, 1)$.” June 10, 2016.
- *Differential Geometry Seminar* at Arizona State University. Talk: “Exploring lattices in complex hyperbolic space.” April 15, 2016.
- *Differential Geometry Seminar* at Arizona State University. Talk: “Mapping class groups and surface automorphisms.” November 13, 2015.
- *SoMSS Research Fair* at Arizona State University. Poster: “Lattices and complex hyperbolic space.” November 19, 2014.
- *Differential Geometry Seminar* at Arizona State University. Talk: “The Hairy Ball Theorem.” April 16, 2014.

Conference Attendance

- *Thin Groups in Number Theory, Geometry, and Topology* at Rice University. May 14 - 18, 2018.
- *Texas Geometry and Topology Conference* at University of Texas, Austin. November 17 - 19, 2017.
- *2017 Virginia Topology Conference* at University of Virginia. November 10 - 12, 2017.
- *Geometric Structures and Representation Varieties Junior Retreat* at Stanford University. July 30 - August 5, 2017.
- *4th Annual AFRL Workshop on the Mathematical Foundations of Probability, Uncertainty, and Decision* at Wright State University. June 20 - 21, 2017.
- *Conference on Low-Dimensional Topology and Geometry and 32nd annual Shanks Lecture* at Vanderbilt University. May 15 - 19, 2017.
- *MSRI Workshop: Groups acting on $CAT(0)$ spaces* at University of California, Berkeley. September 27 - 30, 2016.
- *Joelfest* at University of California, Berkeley. May 20 - 22, 2016.
- *Graduate Student Conference in Algebra, Geometry, and Topology* at Temple University. May 14 - 15, 2016.
- *Tech Topology Conference* at Georgia Insitute of Technology. December 4 - 6, 2015.
- *First Chicago Summer School in Geometry and Topology* at University of Chicago. June 22 - 26, 2015.
- *Graduate Student Topology and Geometry Conference* at University of Illinois, Urbana-Champaign. March 28 - 29, 2015.
- *Texas Geometry and Topology Conference* at University of Texas, Austin. November 14 - 16, 2014.
- *Geometric Structures and Representation Varieties Junior Retreat* at University of Michigan. May 23 - June 1, 2014.
- *Curves and Automorphic Forms* at Arizona State University. March 10 - 14, 2014.
- *Southwest Undergraduate Mathematics Research Conference* at University of Arizona. March 30 - April 1, 2012.

Additional Leadership Roles and Outreach

- 2018: Hosted ASU’s Math Circle activity on *Conway’s Rational Tangles*.
- 2018: Spoke at the ASU Math department’s graduate recruiting weekend for potential incoming graduate students.
- 2017 - 2018: Started up and led a seminar for mathematics graduate students.

- 2017: Joined the ASU Math department's mentoring program to mentor incoming mathematics and statistics TAs.
- 2016: Assisted with ASU Math department's week-long TA Training Program for incoming TAs.
- 2014, 2017: Assisted with ASU's annual *Night of the Open Door* (a community outreach event).
- 2013 - 2017: Assisted with ASU's annual *CryptoRally* (a cryptography-based scavenger hunt).