

# Jack Calcut

King 202, Oberlin College – Oberlin, OH – 44074

☎ 1 (440) 775-8008 • ✉ [jcalcut@oberlin.edu](mailto:jcalcut@oberlin.edu)

🌐 [www2.oberlin.edu/faculty/jcalcut/](http://www2.oberlin.edu/faculty/jcalcut/)

## Employment

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### Oberlin College

*Professor of Mathematics* 2021–23

*Chair of Mathematics* 2019–20, 2022–23

*Associate Professor of Mathematics* 2015–21

*Assistant Professor of Mathematics* 2010–15

### Michigan State University

*Postdoctoral Instructor* 2008–10

Mentor: Selman Akbulut

### University of Texas at Austin

*Postdoctoral Instructor* 2004–07

Mentor: Bob Gompf

## Education

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### University of Maryland

*Ph.D. in Mathematics* 1999–04

Advisor: Elmar Winkelkemper

### Michigan State University

*B.S. in Mathematics* 1994–99

Advisors: Lee Sonneborn and John Masterson

## Primary Research Interests

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Geometric topology, low-dimensional topology, ends of manifolds, and combinatorial and geometric group theory.

## Publications (Oberlin students in bold burgundy)

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21. (with R.M. Young) *Cones*, *Mathematical Gazette* **106** (2022), 549–550.
20. (with C. Guilbault and **P. Haggerty**) *Extreme nonuniqueness of end-sum*, *Journal of Topology and Analysis* **14** (2022), 461–503.
19. (with **J. Li**) *Artin presentations, triangle groups, and 4-manifolds*, *Boletín de la Sociedad Matemática Mexicana* **28** (2022), 15 pp.
18. (with R. Gompf) *On uniqueness of end sums and 1-handles at infinity*, *Algebraic and Geometric Topology* **19** (2019), 1299–1339.

17. (with **J. Metcalf-Burton**) *Double branched covers of theta-curves*, *Journal of Knot Theory and Its Ramifications* **25** (2016), 9 pp.
16. *Rational angled hyperbolic polygons*, *The Mathematics Student* **85** (2016), 103–111.
15. (with H.E. Winkelnkemper) *The explicit algebraic autonomy of Artin Presentation Theory and the Fox Calculus. I*, *Boletín de la Sociedad Matemática Mexicana* **22** (2016), 251–261.
14. (with **P. Haggerty**) *Connected sum at infinity and 4-manifolds*, *Algebraic and Geometric Topology* **14** (2014), 3281–3303.
13. (with **J. Metcalf-Burton**, **T. Richard**, and **L. Solus**) *Borromean rays and hyperplanes*, *Journal of Knot Theory and Its Applications* **23** (2014), 46 pp.
12. (with R. Gompf) *Orbit spaces of gradient vector fields*, *Ergodic Theory and Dynamical Systems* **33** (2013), 1732–1747.
11. (with H. King and L. Siebenmann) *Connected sum at infinity and Cantrell-Stallings hyperplane unknotting*, *Rocky Mountain Journal of Mathematics* **42** (2012), 1803–1862.
10. (with R. Gompf and J. McCarthy) *On fundamental groups of quotient spaces*, *Topology and Its Applications* **159** (2012), 322–330.
9. *Grade school triangles*, *American Mathematical Monthly* **117** (2010), 673–685.
8. (with J. McCarthy) *Discreteness and homogeneity of the topological fundamental group*, *Topology Proceedings* **34** (2009), 339–349.
7. *Gaussian integers and arctangent identities for  $\pi$* , *American Mathematical Monthly* **116** (2009), 515–530.
6. *Torelli actions and smooth structures on 4-manifolds*, *Journal of Knot Theory and Its Applications* **17** (2008), 171–190.
5. *Artin presentations from an algebraic viewpoint*, *Journal of Algebra and Its Applications* **6** (2007), 355–367.
4. *Knot theory and the Casson invariant in Artin presentation theory*, *Fundamentalnaya i Prikladnaya Matematika (Fundamental and Applied Mathematics)* **11**, no. 4, L. V. Keldysh Memorial Proceedings, Moscow (2005) 119–126 (Russian); English translation in *Journal of Mathematical Sciences (New York)* **44** (2007), 4446–4450.
3. (with H.E. Winkelnkemper) *Artin presentations of complex surfaces*, *Boletín de la Sociedad Matemática Mexicana* **10**, Special Issue in honor of F. González-Acuña (2004), 63–87.
2. (with H. King) *Noncompact codimension-1 real algebraic manifolds*, *Michigan Mathematical Journal* **52** (2004), 361–373.
1. *Single rational arctangent identities for  $\pi$* , *Pi Mu Epsilon Journal* **11** (1999), 1–6.

## Submitted (Oberlin students in bold burgundy)

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- (with **L. Axon**) *The end sum of surfaces* (2023), 40 pp.

## In Preparation (Oberlin students in bold burgundy)

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- (with **A. Du**) *Mazur and Jester 4-manifolds* (2023).
- (with **W. Bass**) *Reduced end-cohomology* (2023).
- (with C. Guilbault) *End-cohomology modules and end-sum* (2023).

## Honors Students at Oberlin College

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- William Bass, *Reduced end cohomology* (2022–23).
- Alexandra Du, *Mazur and Jester 4-manifolds* (2021–22).
- Liam Axon, *End-spaces and end-sum of surfaces* (2020–21).
- Tao Hong, *The Dehn invariant of polyhedra* (2019–20).
- James Cumberbatch, *The Kakeya conjecture* (2017–18).
- Jun Li, *Artin presentations and closed 4-manifolds* (2016–17).
- David Myers, *Category theory* (2015–16).
- Jules Metcalf-Burton, *Double branched covers of theta-curves* (2014–15).
- Taylor Richard, *Geometric topology* (2013–14).
- Patrick Haggerty, *Connected sum at infinity and 4-manifolds* (2012–13).
- Madhav Kaushish, *Algebraic number theory* (2010–11).

## Selected Honors and Awards

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- Excellence in Teaching Award, Oberlin College (2014–15).
- Teaching Grant, Oberlin College (2011).
- VIGRE/NSF Dissertation Fellowship, University of Maryland (2004).
- Distinguished Teaching Assistant, University of Maryland (2000–01).
- Andree Award for article *Single rational arctangent identities for pi* from Pi Mu Epsilon Journal (1999).
- L.C. Plant Award for undergraduate research, Michigan State University (1999).

## Teaching Service

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- Ran study sessions for the GRE Mathematics Subject Exam at Oberlin College (2017–23).
- Coached elementary and middle school students (grades 5–8) for local GCCTM mathematics contest (2015–20).
- Honors Coordinator for Mathematics at Oberlin College (2017–19, 2020–23).
- Invited to write the *Four Colleges Mathematics Contest*—founded in 1976—for Denison University, Kenyon College, Ohio Wesleyan University, and Wittenberg University (2018–19). There were 11 teams of three students.
- Organized STEM activities for middle school students (2016).
- Organized STEM activities at Oberlin College for elementary school students (2016).
- Taught Discrete Mathematics at Lake Ridge Academy high school (2015).
- Honors examiner at Kenyon College (2015).

## Selected Talks

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- *Visual Proofs*, University of Puerto Rico Mayaguez Campus (virtual), Mathematics Colloquium, October 3, 2023.
- *Forty years of end sum*, University of Cincinnati, AMS Special Session on Ends and Boundaries of Groups: On the Occasion of Mike Mihalik's 70th Birthday, April 16, 2023.
- *Mazur and Jester 4-Manifolds*, Vanderbilt University, Geometry Seminar, March 2, 2023.
- *Mazur and Jester 4-Manifolds*, University of Maryland, Geometry-Topology Seminar, February 6, 2023.
- *Contractible 4-Manifolds and Knots in  $S^1 \times S^2$* , George Washington University, Topology Seminar, November 3, 2022.
- *Mazur and Jester 4-Manifolds and Knots in  $S^1 \times S^2$* , University of Wisconsin-Milwaukee, Topology Seminar, October 19, 2022.
- *Mazur and Jester 4-Manifolds*, Texas Christian University (virtual), 39th Annual Workshop on Geometric Topology, June 7, 2022.
- *Extreme Nonuniqueness of Connected Sum at Infinity*, University of Alabama at Birmingham, 53rd Annual Spring Topology and Dynamical Systems Conference, March 14, 2019.
- *End-sums of Manifolds*, University of Wisconsin-Milwaukee, Topology Seminar, October 22, 2018.
- *Visual Proofs*, Colby College, Mathematics Colloquium, February 29, 2016.
- *Connected Sum at Infinity*, The Ohio State University, December 9, 2014.
- *Connected Sum at Infinity and Nonuniqueness*, University of Wisconsin-Milwaukee, 31st Annual Workshop on Geometric Topology, June 13, 2014.
- *Connected Sum at Infinity*, University of Tennessee, Knoxville, Sectional Meeting of the American Mathematical Society, Special Session on Geometric Topology, March 21–23, 2014.
- (co-speaker with Margot Calcut) *Special Triangles from Ailles Rectangle and the Golden Triangle*, National Council of Teachers in Mathematics, Annual Meeting, Philadelphia, PA, April 27, 2012.
- *Artin Presentations*, University of South Florida, Sectional Meeting of the American Mathematical Society, March 11, 2012.
- *The Torelli Group, Donaldson's Theorem, and the Casson Invariant in Artin Presentation Theory*, The Ohio State University, November 18, 2010.
- *The Pullback Functor and Covering Spaces*, Dartmouth College, Colloquium, March 11, 2010.
- *Noncompact Codimension-1 Real Algebraic Manifolds*, Michigan State University, Topology Seminar, September 15, 2008.
- *Open Books and Smooth 4-manifolds*, Georgia Institute of Technology, Geometry-Topology Seminar, January 29, 2007.
- *Open Books and Manifolds of Dimension 3 and 4*, Kansas State University, Colloquium, January 11, 2007.
- *Connected Sum at Infinity and Hyperplane Unknotting*, University of Texas at Austin, Topology Seminar, April 3, 2006.
- *Relativity: Understanding Some Physical Principles, Mathematics, and Geometry*, University of Texas at Austin, Saturday Morning Math Group, October 8, 2005.
- *Artin Presentations*, Moscow State University, Russia, August 24–28, 2004.

## Additional Items

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- Co-organizer of the annual Workshop in Geometric Topology (founded in 1984), July 2023–present.
- Life Member of the Mathematical Association of America since 2003.
- Member of the American Mathematical Society, 2003–2019 and 2022–present.
- Associate Editor for The American Mathematical Monthly, 2018–2021.

Last updated October 3, 2023