

Nickolas A. Castro

CONTACT INFORMATION

Rice University
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EMPLOYMENT

Instructor July 2021 - Present
Rice University, Department of Mathematics

Visiting Assistant Professor July 2018 - 2021
University of Arkansas, Department of Mathematical Sciences

UC Davis Chancellor's Postdoctoral Fellow August 2016 - July 2018
University of California, Davis, Department of Mathematics

Postdoctoral/Lead Mentor 2016, 2017, 2019, 2020, 2021
Camp Euclid, High School Mathematics Research Summer Camp

EDUCATION

The University of Georgia, Athens, Georgia USA
Ph.D., Mathematics. May 2016

The University of Georgia, Athens, Georgia USA
Master of Arts, Mathematics. May 2012

California State University Northridge, Northridge, California USA
Bachelor of Arts, Mathematics. December 2008

Pierce College, Woodland Hills, California USA
Associate of Arts, Liberal Arts. June 2006

PUBLICATIONS AND PREPRINTS

11. *On the Contact Cut Complex and Weinstein Manifolds*
with Gabriel Islambouli, Jie Min, Sumeyra Sakalli, Laura Starkston, Angela Wu
In Preparation.
10. *Relative Group Trisections*
with Jason Joseph and Patrick McFaddin
[arXiv:2406.14530](https://arxiv.org/abs/2406.14530), 2024. Submitted
9. *Slice obstructions from genus bounds in definite 4-manifolds*
[arXiv:2303.10587](https://arxiv.org/abs/2303.10587), 2023. Submitted, under review.
8. *The Relative \mathcal{L} -invariant of a Compact 4-manifold with Boundary*
with Gabriel Islambouli, Maggie Miller, and Maggy Tomova
[Pacific Journal of Mathematics](https://doi.org/10.1017/S0025571821000031), 315 (2): 305 - 346, 2021.
7. *Camp Euclid: A Research Experience for Youth – in a Virtual Environment*
with Juliette Benitez and David T. Gay.
[Notices of the AMS](https://doi.org/10.1090/notices/2020/01), December 2020
6. *Trisections of 4-manifolds via Lefschetz fibrations*
with Burak Ozbagci
[Mathematical Research Letters](https://doi.org/10.1017/S0025571819000031), 26(2): 383-420, 2019.
5. *On Dividing a Rectangle*
with Robert Dumitru*, Quinn Perian*, Alexander Nealey*, Mohammed Mannan*, Eddie Beck,
David Gay, Dipen Mehta*, Anish Pandya*, Ejay Cho*, 2018
[arXiv:1808.0648](https://arxiv.org/abs/1808.0648)

*This paper was the result of a research group from Camp Euclid 2016. * indicates high school co-authors.*

4. *Trisections of 4-manifolds with Boundary*
with David T. Gay and Juanita Pinzón Caicedo,
[Proceedings of the National Academy of Sciences](#), Oct 2018, 115 (43) 10861-10868;
3. *Diagrams for Relative Trisections*
with David T. Gay and Juanita Pinzón Caicedo
[Pacific Journal of Mathematics](#), 294-2 (2018), 275-305.
2. *Trisecting Smooth 4-dimensional Cobordisms*
[arXiv:1703.05846](#), 2017.
1. *Relative Trisections of Smooth 4-manifolds with Boundary*
Ph.D. Thesis, The University of Georgia, 2016

TEACHING EXPERIENCE

Rice University

- *Linear Algebra* Fall 2024, Spring 2024
- *Graduate Topics Course in Low-dimensional Topology* Spring 2024
- *Undergraduate Knot Theory* Fall 2023
- *Calculus 1* Fall 2023, Fall 2022, Spring 2022, Fall 2021
- *Geometry of Surfaces* Spring 2022
- *Integration* (Calculus 1; part 2) Spring 2022
- *Differentiation* (Calculus 1; part 1) Fall 2021
- *Calculus 3* Spring 2020

University of Arkansas

- *Calculus 1* (Remote instruction via Zoom) Fall 2020, Spring 2021
- *Applied Linear Algebra* (Remote instruction via Zoom) Summer 2019, 2020, 2021
- *Calculus 2* (Partial Remote instruction) Spring 2020
- *Calculus 1* Spring 2019, Fall 2019
- *Survey of Calculus* Summer 2018, Fall 2018

The University of Georgia

- *Calculus 1* Spring 2011, Fall 2014, Spring 2015, Fall 2015
- *Precalculus* Fall 2010, Fall 2013
- *Topology Qualifying Exam Problem Session* Summer 2013, 2014
- *Calculus* Fall 2009, Spring 2010

- Writing Intensive Program TA Fall 2012, Spring 2013 *For courses designed for future math educators*

AWARDS AND FELLOWSHIP

AIM SQuaRE, with P. Aceto, M. Miller, J. Park, A. Stipsicz
Fibered ribbon knots and Casson-Gordan exotic 4-spheres 2020 - Present

New Faculty Teaching Commendation
The University of Arkansas 2018-2019

The University of Georgia Graduate Student Excellence in Research Award
Mathematical and Physical Sciences 2017

The University of California, Davis Chancellor's Postdoctoral Fellowship
Mentor: Professor Abigail Thompson 2016 - 2018

Southern Regional Education Board Dissertation Completion Award
SREB Doctoral Scholars Program 2015-2016

VIGRE Research Fellowship
February 2014 - July 2014, August 2011 - June 2012

California State University Northridge PUMP Undergraduate Award
September 2007 - December 2008

INVITED TALKS

The $(2,1)$ -cable of Figure Eight Knot is not Slice November 2023
Topology Seminar, University of California, Davis

The $(2,1)$ -cable of Figure Eight Knot is not Slice October 2023
Topology Seminar, University of Georgia

Relative Group Trisections and December 2022
BIRS Workshop on *Topology in Dimension 4.5*, Banff, Calgary, Canada.

Relative group trisections and smooth 4-manifolds with boundary January 2021
JMM Special Session on 3- and 4-manifolds (*Virtually*)

Relative Trisections and Isotopies of the 4-ball December 2020
Centro de Investigación en Matemáticas, GTO, México (*Virtual Seminar*)

Future Directions of Relative trisections July 2020
Geometry/Topology Grad. Student and Postdoc. Seminar (*GTGAPS Virtual Seminar*)

Lefschetz Fibrations and Trisections October 2018
Topology Seminar, Oklahoma State University

Complicated Monodromies and Trisections April 2018
AMS Spring Eastern Sectional Meeting, Northeastern University

Relative Trisections and Bounding Open Book Decompositions April 2018
Redbud Topology Conference, Oklahoma State University

Relative Trisections and Lefschetz Fibrations November 2017
Topology Seminar, Brigham Young University

Interactions Between 3- and 4-manifolds via Trisections November 2017
Topology Seminar, University of California, Santa Barbara

Relative Trisections and Fibered Knots October 2017
Topology Seminar, The University of Georgia

	<i>Relative Trisection Diagrams</i> Algebra/Topology Seminar, The University of Alabama	February 2017
	<i>Trisections of Smooth 4-manifolds</i> Department Colloquium, California State University Northridge	December 2016
	<i>Trisections of Smooth 4-manifolds with Boundary</i> ECSTATIC 2, Imperial College London	June 2016
	<i>Gluing and Stabilizing Relative Trisections</i> AMS Spring Southeastern Sectional Meeting, The University of Georgia	March 2016
	<i>Relative Trisection Diagrams of Smooth 4-manifolds with Boundary</i> Topology Seminar, Georgia Institute of Technology	November 2015
	<i>Topology in Dimensions Zero Through Four</i> General Audience Colloquium, Wofford College	November 2015
	<i>Trisecting 4-manifolds With Boundary</i> Topology Seminar, University of Texas Austin	November 2014
OUTREACH AND VOLUNTEERING	<i>Rice University Directed Reading Program Mentor</i> Heegaard Splittings of 3-manifolds	Fall 2023
	<i>California State University Northridge Mathematics Open House</i> Virtual Panelist for “Alumni in Teaching” session	Spring 2023
	<i>Camp Euclid: Research Summer camp for High Schoolers</i> Lead mentor, Postdoctoral Mentor	2016, 2017, 2019, 2020, 2021
	<i>University of Georgia Mentor Program</i> Alumni mentor for current students at the University of Georgia	Fall 2020 - current
	<i>American Mathematics Competition 8, 10, & 12.</i> University of Arkansas Team Leader	2019 - 2020
	<i>Math Olympiad for Elementary and Middle School</i> Person in Charge of Olympiad, Lead Mentor for Math Club	2019 - 2020
	<i>Women’s Empowerment</i> Mathematics Instructor, Resident Manager Program Pre-Training	January 2018
	<i>COSMOS UC Davis</i> Mathematics Cluster Teacher Fellow (Knots, Links and the Topology of Spaces)	July 2017
	<i>Women’s Empowerment</i> Graphic design for “The Get a Job Kit”, www.thegetajobkit.com .	July 2017
	<i>Summer PUMP Program, California State University, Los Angeles</i> Inspirational Speaker	July 2016
	<i>Underrepresented Students in Topology and Algebra Research Symposium</i> Mentor Panelist	April 2016
	<i>The University of Georgia High School Math Camp</i> Program Director	Summer 2014
	<i>Volunteer for Math Counts program at UGA</i>	Fall 2013

