

# Casey DOUGLAS

## PERSONAL INFO

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## EMPLOYMENT HISTORY

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UNIVERSITY OF HOUSTON	Instructional Assistant Professor of Mathematics (Aug 2019 - Present) Lecturer of Mathematics (Aug 2018 - June 2019)
ST. MARY'S COLLEGE OF MD	Associate Professor of Mathematics (Aug 2015 - Aug 2019) Program Director, ESP-REU (June 2016 - Aug. 2016) Assistant Professor of Mathematics (Aug 2009 - Aug 2015)
UNIVERSITY OF GRANADA, SPAIN	Visiting Researcher (June 2009)
RICE UNIVERSITY	Lecturer of Mathematics (Aug 2017 - May 2018, May 2009) Graduate Student & TA (Aug 2003 - May 2009)
SOUTHWESTERN UNIVERSITY	Mathematics Tutor (Aug 1999 - May 2003)

## EDUCATION

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MAY 2009	PhD in MATHEMATICS, <b>Rice University</b> Thesis: "Perturbed, Genus-One Scherk Surfaces and Their Geometric Limits." Advisor: Prof. Michael WOLF
MAY 2007	MA in MATHEMATICS, <b>Rice University</b>
MAY 2003	BA in English and Mathematics, <b>Southwestern University</b> (Summa Cum Laude)

## PUBLICATIONS

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TO APPEAR	<i>Constructible Pi (and other block-based adventures in Geometry)</i> (24 pages), invited chapter for upcoming volume in <i>Foundations for Undergraduate Research in Mathematics</i> (FURM) book series, Springer
MARCH 2018	Co-Editor of PRIMUS, special issue on Project Based Learning (Vol. 28, Issue 4)
MARCH 2018	<i>Introduction to the Special Issue</i> , with E. Köse (1 page), PRIMUS
DEC 2014	<i>Equitable Mirrors</i> , with E. Köse, N. Stack*, and C. VanBlargan* (10 pages), Applied Optics
OCT 2014	<i>Constant Mean Curvature Surfaces in <math>G^n</math></i> , (15 pages), International Journal of Geometry
JAN 2014	<i>Genus One Scherk Surfaces and Their Limits</i> (62 pages), Journal of Differential Geometry

## SCHOLARLY WORK UNDER REVIEW OR IN PROGRESS

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UNDER REVIEW	<p><i>Cosh, Cosh<sub>p</sub>, B-Cosh</i> with A. Meadows and B. Thomas* (18 pages)</p> <p><i>Turning, Sweeping, Shrinking, Minimizing</i>, (12 pages) originally accepted by <i>The College Math Journal</i> in 2017, but required re-submission due to processing issues</p> <p><i>Eigenmetric Curves and the Perimeter-Area Property of Dual Norm Balls</i>, (7 pages) with A. Meadows</p>
IN PREPARATION	<p><i>A Dynamic Model of Ethno-Nationalist Terrorism</i>, with A. Caglar</p> <p><i>Non-Euclidean Photography</i></p> <p><i>A Hyperbolic Invitation to Eikonal Equations</i>, with A. Meadows</p> <p><i>Lord of the Pi's</i>, with S. Ganzell and A. Meadows</p>

## GRANTS

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MAA PIC MATH:	\$5,000.00 (with E. Köse), 2017
NSF REU (DMS 1560301):	\$282,732.00 (with S. Ganzell) 2016-2020
CURM	\$2,000.00, 2014-2015 \$17,000.00, 2013-2014
INTERNAL GRANTS (SMCM):	\$2,000.00 2015-2016 \$1,500.00, 2012-2013 \$3,000.00, 2009-2010

## UNDERGRADUATE RESEARCH PROJECTS

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Length, Area & Norms	Collaborating with undergraduates and colleagues on multiple projects about the geometry of finite dimensional Banach spaces. One manuscript has been submitted with several others in preparation; currently looking to involve UH and Houston-area students in these projects (2018-present).
Maps & Mirrors	Oversaw research done by two groups of three math majors at St. Mary's. This research involves a new and exciting area of mathematics that lies at the intersection of Differential Geometry and Applied Mathematics. Students worked on designing reflective surfaces that solve problems in optics, resulting in several conference presentations and one publication. Continued work on these problems is ongoing with students at UH, (2013-present).
Self-Shrinkers	Oversaw research done by various math majors at St. Mary's. Research involved open and classical questions concerning self-shrinking and self-expanding solutions to the mean curvature flow. Presentations at regional and national conferences were made by participants, (2011-2013).

## UNDERGRADUATE RESEARCH PROJECTS (CONT'D)

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Manifolds with Density	Oversaw research done by three math majors at St. Mary's; pursued open questions in the differential geometry of manifolds with density. Presentations at the 2011 CURM conference in Provo, UT were made by all participants, (2010-2011).
Discrete Isoperimetry	Oversaw research done by various undergraduates as part of an NREUP. Research involved a discrete version of the classical isoperimetric problem and its connections to new topics in number theory. This work culminated in one publication conference presentations, (Summer 2010, Summer 2012).
Minimal Vector Fields	Assisted undergraduates with research projects, presentations, and independent studies as part of Rice University's VIGRE program. Vector fields on spheres were studied and their energies re-contextualized and minimized, (2005-2006).

## TEACHING

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University of Houston	Accelerated Calculus - MATH 1451 - (2018) Transition to Advanced Mathematics - MATH 3325 - (2018) Calc. for Bus & Life Sciences - MATH 1314 - (2018, 2019) Intro. to Math. Reasoning - MATH 1312 - (2019- current) Pre Calc. - MATH 1330 - (2019, 2020, 2021) Calculus - MATH 1431 (2019 - current) Discrete Mathematics - MATH 3336 - (2020) Elements of Algebra & Number Theory - MATH 3303 - (2021) Forman & Informal Geometry - MATH 3305 - (2021)
St. Mary's College of MD	Survey of Math. - MATH 131 - (2017) Calculus I - MATH 151 - (2009-2015) Calculus II - MATH 152 - (2010-2016) Multivariable Calculus - MATH 255 - (2009, 2011, 2014-2016) Linear Algebra - MATH 256 - (2013, 2016) Foundations of Math. - MATH 281 - (2012-2013, 2015-2016) Abstract Algebra - MATH 321 (2010, 2011) Abstract Algebra II - MATH 322 - (2011, 2012) Real Analysis I - MATH 351 - (2016) Real Analysis II - MATH 352 - (2017) Complex Analysis - MATH 451 - (2010, 2012, 2014) Differential Geometry - MATH 485 - (2015) Graph Theory - COSC 455 - (2015) Topology - MATH 461 - (2013) Riemannian Geometry (Ind. Study) - MATH 495 - (2016) Chemical Algebra (Ind. Study) - MATH 495 - (2016) Advanced Linear Algebra (Ind. Study) - MATH 495 - (2014)
Rice University	Calculus I - MATH 101 - (2006) Ord. Diff. Equations & Lin. Algebra - MATH 211 - (2005, 2017, 2018) Multivariable Calculus - MATH 212 - (2009) Linear Algebra - MATH 355 - (2007, 2008)

## SELECTED TALKS & PRESENTATIONS

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- *Wobbly, Twisted, Mirrored Pi*, Meet & Greet & Pi Day Celebration, University of Houston, March 6, 2020 (Invited Talk).
- *Non-Euclidean Photography (or How To Redirect Bent Light)*, Undergraduate Mathematics Colloquium, Rice University, March 23, 2018.
- *Raised Turning-Sweepers* (student talk by D. Weber), MAA Spring Sectional Meeting, Montgomery College, April 16, 2016.
- *Maps and Mirrors* (student talk by A. Steinfeld and J. Saltzberg), MAA Spring Sectional Meeting, Roanoke College, April 25, 2015
- Panelist for Project NExT discussion group on undergraduate education, Joint Mathematics Meetings, January 2015.
- Session Chair and Co-Organizer for Mathematics and Cartography session, Joint Mathematics Meetings, January 2015.
- Session Chair and Co-Organizer for Undergraduate Research and Project Based Curricula, MathFest, August 2014.
- *Equitable Mirrors* (student talk by C. Van Blargen and N. Stack), Center for Undergraduate Research in Mathematics Conference, March 2014 and Joint Mathematics Meetings, January 2014.
- *The Great and Powerful O.*, St. Mary's College of Maryland NSM, November 2013 (Invited Talk).
- *What do Math and LEGOs Have in Common?* (student talk by C. Winterer, S. Sprague, and I. Guadarrama), Joint Mathematics Meetings, January 2013.
- *Gaussian Lines and Circles* (student talk by N. Pasko), Joint Mathematics Meetings, January 2013.
- *A LEGO Isoperimetric Problem* (student presentation by E. Darring), Young Mathematicians Conference, July 2012 (invited presentation).
- *An Undergraduate Approach to Mean Curvature Flow* (student talk by J. Kaminsky), Regional Undergraduate Mathematics Research Conference, April 2012.
- *Weighted geodesics and self-similar curve shortening*, George Washington University, March 17, 2012 (Invited Talk)
- *WILL PROVE FOR FOOD: Career Opportunities for Mathematics Majors*, St. Mary's College of Maryland, 2011 and 2012 (Invited Talk).
- *What Is/Was/Will be a Minimal Surface?*, BYU, Provo, UT March 23rd, 2010 (Invited Talk).
- *Constructing and Obstructing Minimal Surfaces*, Johns Hopkins University, Baltimore, MD. March 15th, 2010 (Invited Talk).
- *Perturbed, Genus-One Scherk Surfaces and Their Limits*, University of Granada, Granada, Spain June 10, 2009 (Invited Talk).

## SERVICE & OUTREACH

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University of Houston	NTT-APRC Math. Dept. Committee (Spring 2021) Review & assess annual reports of Instructional Faculty in Math PACE Course Redesign - Math Committee Member (2021 - 2024) Three-year term to propose improvements and revisions for College Alg. Course Coordinator MATH 1312 & MATH 1431 (Spring 2020 - current) Update & share new course materials (i.e. syllabi, assignments, exams, supplementary resources) Calculus Contest Exam Writer (2020, 2021)
St. Mary's College of MD	College Evaluation Committee (2015-2017) Faculty Development Grant Committee (2014-2017) Library Liaison (2011-2017) IRB Committee Member (2013-2016) Natural Science & Math. Colloquium Committee Member (2011-2012)
Profession	Reviewer for Amer. Math. Monthly (2021) Reviewer for <a href="#">FURM</a> book series (2021) Speaker, <i>Recognition of Academic Achievement</i> , Southwestern University (2017) Math Circle Co-organizer & speaker, Southern Maryland (2014-2016) <a href="#">AMS Blog on Math Blogs Interview</a> (2015) Guest Speaker / Consultant for REU, Brigham Young University (2010)

## FELLOWSHIPS & HONORS

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- Project NeXT Fellowship (2009-2010)
- NSF VIGRE Fellowship, Rice University (2005-2007)
- Graduate Fellowship, Rice University (2003-2009)
- Phi Beta Kappa Membership, Southwestern University (2003)

## PROFESSIONAL ORGANIZATIONS & INTERESTS

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- American Mathematical Society, 2003-Present
- Mathematical Association of America, 2003-Present
- Cycling, LEGO Clubs, Film

References Available Upon Request