

# Brittany Terese Fasy

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## CONTACT INFORMATION

Gianforte School of Computing  
Montana State University  
Bozeman, MT 59717

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## EDUCATION

**Ph.D.**, Computer Science, 2012  
Duke University, Durham, NC

Thesis: *Modes of Gaussian Mixtures and an Inequality for the Distance Between Curves in Space*  
Adviser: Herbert Edelsbrunner

**B.S.**, Mathematics and Computer Science, 2007  
Saint Joseph's University, Philadelphia, PA

Honors Program. Summa Cum Laude.

Thesis: *Homotopy Classification of the Components of the Space of Maps into an Aspherical Space: a Problem in the Intersection of Group Theory and Topology*

Adviser: Samuel Smith

## RESEARCH POSITIONS

**Affiliate Faculty**, Mathematical Sciences, 2017–present

**Assistant Professor and Gianforte Faculty Fellow**, Computer Science, 2015–present  
Montana State University, Bozeman, MT

**Postdoctoral Researcher and Newcomb Fellow**, Computer Science, 2013–2015

Tulane University, New Orleans, LA

Adviser: Carola Wenk

**Postdoctoral Fellow**, Computer Science, 2012–2013

Carnegie Mellon University, Pittsburgh, PA

**Visiting Scientist**, 2009–2012

IST Austria, Vienna, Austria

**College Student Senior Technical Specialist**, May 2006–August 2008

Lockheed Martin, King of Prussia, PA

Lockheed Martin, Gaithersburg, MD

**University Scholar Research**, Mathematics, 2006–2007

Saint Joseph's University, Philadelphia, PA

Adviser: Samuel Smith.

**Summer Research Scholar**, Computer Science Education, 2004–2005

Saint Joseph's University, Philadelphia, PA

Adviser: Stephen Cooper.

## CURRENT GRANTS

*QuBBD: Collaborative Research: Quantifying Morphologic Phenotypes in Prostate Cancer - Developing Topological Descriptors for Machine Learning Algorithms*

1 August 2017–31 July 2020 (est.), co-funded by NIH and NSF, DMS 1664858, \$420,706.

PI: BTF; co-PI J. Sheppard.

Senior Personnel: G. Pritham (Bozeman Health).

Collaborative Grant: DMS 1557750 (PI Wenk, Tulane).

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*Improving the Pipeline for Rural and American Indian Students Entering Computer Science Via Storytelling*

1 August 2017–31 July 2020 (est.), National Science Foundation, DRL 1657553, \$1,149,691.

PI: BTF; co-PIs: Stacey Hancock, Barbara Komlos, Sweeney Windchief, and Mike Wittie.

Senior Personnel: Connie Chang and Carolyn Plumb.

- REU Supplement: Summer 2018 for \$16,000 (will fund two REU students).

*Collaborative Research: ABI Innovation: Biofilm Resource and Information Database (BRaID): A Tool to Fuse Diverse Biofilm Data Types*

1 August 2017–31 July 2020 (est.), National Science Foundation, DBI 1661530, \$299,853.

PI: David Millman; co-PI: Brendan Mumey

Senior Personnel: BTF and Matthew Fields

Collaborative Grant: DBI 1661527 (PI Ramaraj, NCGR).

*AF: Small: Collaborative Research: Geometric and Topological Algorithms for Analyzing Road Network Data*

1 July 2016–30 June 2018 (est.), National Science Foundation, CCF 1618605, \$152,824.

PI: BTF

Collaborative Grants: CCF 1618469 (PI Wenk, Tulane) and CCF 1618247 (PI Wang, Ohio State).

- REU Supplement: Summer 2017 for \$19,000 (funded two REU students).

*Workshop for Women in Computational Topology*

15 June 2016–31 January 2018 (est.), National Science Foundation, DMS 1619908, \$30,000.

PI: L. Ziegelmeier (Macalester); co-PIs: BTF and E. Chambers (St. Louis U).

- Additional support from Microsoft Research: \$5,000.
- Funding for follow-up meetings from IMA: \$15,000.

PREVIOUS GRANTS *QuBBD: Collaborative Research: Towards Automated Quantitative Prostate Cancer Diagnosis*  
15 September 2015–31 August 2017, co-funded by NIH and NSF, DMS 1557716, \$46,639.  
PI: BTF  
Collaborative Grant: DMS 1557750 (PI Wenk, Tulane)

Assisted writing addendum to NSF Grant CCF-1301911, *AF: Small: Geometric Algorithms for Constructing Road Networks from Trajectories*. PI: C. Wenk. Addendum amount: \$10,001.

GRADUATE STUDENT ADVISEES Robin Belton, current Ph.D. student.  
Department of Mathematical Sciences, Montana State University. Fall 2016–present.

Sushovan Majhi, co-advising with C. Wenk and R. Komendarczyk, current Ph.D. student.  
Department of Mathematics, Tulane University. Fall 2015–present.

Samuel Micka, co-advising with B. Mumey, current Ph.D. student.  
School of Computing, Montana State University. Spring 2016–present.

Anna Schenfisch, current Ph.D. student.  
Department of Mathematical Sciences, Montana State University. Summer 2017–present.

UNDERGRADUATE RAS Parker Evans, co-advising with Carola Wenk. Goldwater Scholar, 2017.  
Department of Mathematics, Tulane University. Spring 2016–present.

McNair Scholars: Justin O’Dea (2016), Angus Tomlinson (2017).

MSU Emerging Scholars: Maia Grudzien (2016), Jachi Madubuko (2017)

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2017 REU Students: Maia Grudzien (MSU), Carrington Metts (William & Mary), Kira Wencek (U Rhode Island).

MSU USP Advisees (Undergraduate Research Grants): Jachi Madubuko (AY '17–18), Hayley Smith (Spr. '17), Rostik Mertz (AY '16–17), Angus Tomlinson (AY '16–17), Maia Grudzien (Sum. '16), Ryan Thompson (Spr. '16, AY '16–17), and Sawyer Payne (Spr. '16).

Other MSU Undergraduate Research Advisees: Brendan Kristiansen, James Soddy (B.S., 2017), Saurabh Tulsankar.

Lee Chedister (Math, Tulane U., Capstone Project co-advised with C. Wenk, AY '13–14).

## GRADUATE TEACHING

**Instructor**, Computational Topology, Spring 2018  
Montana State University, Bozeman, MT.

**Instructor**, Algorithms (Graduate), Spring 2017  
Montana State University, Bozeman, MT.

**Instructor**, Computational Geometry and Topology (Special Topics), Spring 2016  
Montana State University, Bozeman, MT.

**Instructor**, Topology, September 2011–April 2012  
Institute for Science and Technology Austria, Klosterneuburg, Austria.

## UNDERGRADUATE TEACHING

**Instructor**, Advanced Algorithmic Topics, Fall 2015, Fall 2016, Fall 2017  
Montana State University, Bozeman, MT.

**Co-Instructor**, Computational Geometry (Undergraduate), Spring 2013  
Computer Science Department, Carnegie Mellon University, Pittsburgh, PA.

**Co-Instructor**, Discrete Mathematics for Computer Science, Spring 2009  
Computer Science Department, Duke University, Durham, NC.

**Teaching Assistant**, Principles of Computer Science, Spring 2008  
Computer Science Department, Duke University, Durham, NC

**Student Mentor and Grader**, Calculus I and III, January 2004–May 2007  
Mathematics and Computer Science Department, Saint Joseph's University, Philadelphia, PA.

**Recitation Leader**, Business Calculus, Spring 2004  
Mathematics and Computer Science Department, Saint Joseph's University, Philadelphia, PA.

## OTHER TEACHING

**Textbook Assistant**, *Learning to Program with Alice*, December 2004  
Saint Joseph's University, Philadelphia, PA

## AWARDS AND HONORS

Postdoc of the Month, Journal of Postdoctoral Research. January 2016.

Graduate Aid in Areas of National Need Fellowship, August 2007–May 2011.

Barry M. Goldwater Scholarship, 2006.

Google Anita Borg Scholarship Finalist, 2007.

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USA Today All-USA College Academic Team, honorable mention, 2005.

Honor Societies: Phi Beta Kappa, Upsilon Pi Epsilon (Computer Science), Pi Mu Epsilon (Mathematics), Sigma Xi

## UNIVERSITY AWARDS

Faculty Excellence Grant and ADVANCE mini-grant, MSU, 2017. Amount: \$5,000.

Departmental Research Award, School of Computing, MSU, 2017.

Nominated, CFE Teaching Award, MSU, 2016.

Duke University Computer Science Award for Teaching Discrete Mathematics, Spring 2009

Saint Joseph's University Mathematics Award, May 2007.

University Scholar, Saint Joseph's University, 2006-2007.

Presidential Scholarship and Del Marco Scholarship, Saint Joseph's University, 2003-2007.

Diocesan Scholar Fellowship, Archdioceses of Philadelphia, 2002-2003.

## SIGNIFICANT STUDENT AWARDS

Parker Evans (Undergraduate, Tulane U., Mathematics), 2017 Goldwater scholar.

Undergraduate researcher Maia Gruzien and Graduate student Sam Micka won first and second prize for research presentations at IHEEP 2016 in Helena, Montana.

## JOURNAL PAPERS

A. Bittner, BTF, M. Grudzien\*, S. Ghosh Hajra, J. Huang, K. Pelatt, C. Thatcher, A. Tumurbaatar, and C. Wenk. Comparing Directed and Weighted Road Maps. AWM-IMA Special Issue on Research in Computational Topology, Springer, to appear.

F. Chazal, BTF, F. Lecci, B. Michel, A. Rinaldo, and L. Wasserman. Robust Topological Inference: Distance To a Measure and Kernel Distance. JMLR, to appear. Also available at [arXiv:1412.7197](https://arxiv.org/abs/1412.7197).

BTF. Statistical Techniques in TDA with Applications to Real Data. Postdoc Journal 4 (1), Jan. 2016.

M. Ahmed, BTF, K. S. Hickmann, and C. Wenk. Path-Based Distance for Street Map Comparison. ACM TSAS Inaugural Issue 1 (1). Article 3. Aug. 2015.

BTF, F. Lecci, A. Rinaldo, L. Wasserman, S. Balakrishnan, and A. Singh. Confidence Sets for Persistence Diagrams. *Annals of Statistics*, vol. 42 (6), pages 2301–2339, 2014. Also available at [arXiv:1303.7117](https://arxiv.org/abs/1303.7117).

H. Edelsbrunner, BTF, and G. Rote. Add Isotropic Gaussian Kernels at Own Risk: More and More Resilient Modes in Higher Dimensions. *Discrete and Comp. Geom.*, vol. 49 (4), pages 797–822, June 2013.

F. Chazal, BTF, F. Lecci, A. Rinaldo, A. Singh, and L. Wasserman. On the Bootstrap for Persistence Diagrams and Landscapes. *Modeling and Analysis of Information Systems*, vol. 20 (6), pages 96–105, Dec. 2013. Also available at [arXiv:1311.0376](https://arxiv.org/abs/1311.0376).

BTF. The Difference of Lengths of Curves in  $\mathbb{R}^n$ . *Acta Sci. Math. (Szeged)*, vol. 77 (1-2), pages

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\* Undergraduate student at time of research or submission.

359–67, 2011.

PEER-REVIEWED  
CONFERENCE  
PAPERS

E. Chambers, BTF, Y. Wang, and C. Wenk. Map-Matching Using Shortest Paths. *Proc. IWISC*, Apr. 2018.

K. Buchin, M. Buchin, D. Duran, BTF, R. Jacobs, V. Sacristn, R. I. Silveira, F. Staals and C. Wenk. Clustering trajectories for map construction. *Proc. ACM SIGSPATIAL GIS*, Nov. 2017. 17.9% acceptance rate.

S. Micka, S. Yaw, BTF, B. Mumey and M. P. Wittie. Efficient Multipath Flow Monitoring. *Proc. IFIP Networking*, June 2017. 28.7% acceptance rate.

U. Goel, C. Cooper\*, BTF, and M. P. Wittie. A First Look at Web Browsing Predictions using DNS Logs. *Proc. 25<sup>th</sup> Int. Conf. on Software Eng. and Data Eng. (SEDE)*, Sept. 2016, pp. 53–60.

M. Ahmed, BTF, M. Gibson, and C. Wenk. Choosing Thresholds for Density-Based Map Construction Algorithms. *Proc. ACM SIGSPATIAL GIS*, Nov. 2015. 17.9% acceptance rate.

M. Cohen\*, BTF, G. L. Miller, A. Nayyeri, D. Sheehy, and A. Velingker. Approximating Nearest Neighbor Distances. *Proc. WADS*, Aug. 2015. 36.5% acceptance rate.

F. Chazal, BTF, F. Lecci, B. Michel, A. Rinaldo, and L. Wasserman, Subsampling Methods for Persistent Homology. *Proc. ICML*, Jul. 2015. Also available at [arXiv:1406.1901](https://arxiv.org/abs/1406.1901). 26% acceptance rate.

M. Ahmed, BTF, and C. Wenk. Local Persistent Homology Based Distance Between Maps. *Proc. ACM SIGSPATIAL GIS*, Nov. 2014. 21.2% acceptance rate.

F. Chazal, BTF, F. Lecci, A. Rinaldo, and L. Wasserman. Stochastic Convergence of Persistence Landscapes and Silhouettes. *Proc. 27<sup>th</sup> Annu. Symp. Comp. Geo.*, pages 474–83, June 2014. Also available at [arXiv:1313.0308](https://arxiv.org/abs/1313.0308). 34% acceptance rate.

M. Cohen\*, BTF, G. L. Miller, A. Nayyeri, R. Peng, and N. Walkington. Solving 1-Laplacians in Nearly Linear Time: Collapsing and Expanding a Topological Ball. *Proc. ACM-SIAM Symposium on Discrete Algorithms*, pages 204–16, January 2014. 28% acceptance rate.

H. Edelsbrunner, BTF, and G. Rote. Add Isotropic Gaussian Kernels at Own Risk: More and More Resilient Modes in Higher Dimensions. *Proc. of the 27<sup>th</sup> Annu. Symp. Comp. Geo.*, pages 91–100, June 2012. 35% acceptance rate.

INVITED ARTICLES

BTF and B. Wang. Open Problems Column, *ACM SIGACT News* 48 (1), Aug. 2017.

E. Chambers, BTF, and L. Ziegelmeier. WinCompTop 2016. Association for Women in Mathematics (AWM) Newsletter 46(6), Nov. 2016.

PUBLISHED  
ABSTRACTS

BTF, R. Komendarczyk, S. Majhi, and C. Wenk. Topological and Geometric Reconstruction of Metric Graphs in  $\mathbb{R}^n$ . Fall Workshop on Computational Geometry, 2017.

BTF, S. Karakoç, and C. Wenk. On Minimum Area Homotopies. *Computational Geometry: Young Researchers Forum*, 2016.

M. Ahmed, BTF, and C. Wenk. New Techniques in Road Network Comparison. *Proc. Grace Hopper Celebration for Women in Computing*, Oct. 2014. 22% acceptance rate.

- T. Roman, BTF, A. Nayyeri, G. L. Miller and R. Schwartz. Improved Geometric Unmixing Models for Tumor Progression. *Proc. Great Lakes Bioinformatics Conf.*, May 2014.
- T. Roman, BTF, A. Nayyeri, G. L. Miller and R. Schwartz. Determining Low-Dimensional Embeddings in High-Dimensional Genotype Space for Tumor Phylogeny Reconstruction. *Proc. Great Lakes Bioinformatics Conf.*, May 2013.
- WORKS IN PROGRESS
- E. Chambers, BTF, Y. Wang. and C. Wenk. Various Shortest Path Type Problems. In preparation.
- J. Cisewski, BTF, W. Hellwing, M. Lovell, A. Rinaldo, L. Wasserman, and M. Wu\*. Topological hypothesis tests for the large-scale structure of the Universe. In preparation.
- P. Evans\*, BTF, C. Wenk. Structural Properties of Self-Overlapping Curves. In preparation.
- BTF, S. Hancock, S. Micka, D. L. Millman, J. Soddy\*, A. Theobald. Computer Science Students' Perspectives on Plagiarism. In preparation.
- BTF, S. Karakoç, C. Wenk. On Minimum Area Homotopies of Normal Curves in the Plane. In preparation. Available at [arXiv:1707.02251](https://arxiv.org/abs/1707.02251).
- BTF, J. Kim, F. Lecci, C. Maria, and V. Rouveau. Introduction to the R Package TDA. Available at [arXiv:1411.1830](https://arxiv.org/abs/1411.1830).
- OTHER MANUSCRIPTS
- BTF. Modes of Gaussian Mixtures and an Inequality for the Distance Between Curves in Space. PhD Dissertation, Duke University, Durham, NC. June 2012.
- BTF. The Total Curvature of a Knotted Curve. Translation of Istvan Fáry's Sur la courbure totale d'une courbe gauche faisant un noeud. 2010. <http://www.cs.duke.edu/~brittany/research/fary.pdf>.
- BTF. Persistence Diagrams and the Heat Equation Homotopy. 2010. Available at [arXiv:1002.1937](https://arxiv.org/abs/1002.1937).
- BTF. Homotopy Classification of the Components of the Space of Maps into an Aspherical Space: a Problem in the Intersection of Group Theory and Topology. Undergraduate Honors Thesis, Saint Joseph's University, Philadelphia, PA. May 2003.
- SOFTWARE
- TDA, R package. Co-developed with Fabrizio Lecci in 2014. Maintained by BTF and Jisu Kim <http://cran.r-project.org/web/packages/TDA/>.
- CONFERENCE PRESENTATIONS
- Stochastic Convergence of Persistence Landscapes and Silhouettes*. Annu. Symp. Comp. Geo. Kyoto University, Japan. June 2014.
- Statistical Inference for Persistent Homology*. International Conf. Geometry, Topology, and Applications, Yaroslavl', Russia. Sept. 2013.
- Statistical Inference for Persistent Homology*. Fifth Discrete Geometry and Algebraic Combinatorics Conf., Brownsville, TX, April 2013.
- Geometry of Gaussian Mixtures*. Yaroslavl' International Conf. Discrete Geometry. Yaroslavl', Russia. August 2012.
- Add Isotropic Gaussian Kernels at Own Risk*. Annu. Symp. Comp. Geo. University of North Carolina, Chapel Hill, NC, June 2012. Runner up for best student presentation award.

*Exploring Computational Mathematics: Unfolding Polyhedra.* Joint presentation with D. L. Millman. Contributed Paper Session, MathFest. Madison, WI, August 2008.

## WORKSHOP TALKS

*Topological Descriptors: Statistics and Applications.* Applied Algebraic Topology. Sapporo, Japan. August 2017.

*Understanding and Comparing Data Sets Using Topological Descriptors.* Hausdorff Institute for Mathematics, Bonn, Germany. May 2017.

*Storytelling to Improve the Pipeline to CS.* Big Ideas in Big Sky; Big Sky, MT. May 2017.

*Topological Descriptors.* Joint Mathematics Meeting. Atlanta, GA. January 2017.

*Using Topological Data Analysis to Study Glandular Architecture.* 1<sup>st</sup> International Workshop on Topological Data Analysis in Biomedicine (TDA-Bio), ACM BCB, Seattle, WA. October 2016.

*Using Statistics in Topological Data Analysis.* AWM Research Symposium. College Park, MD. April 2015.

*Road Network Comparison: an Application of Topological Data Analysis.* XXI<sup>st</sup> Oporto meeting on Geometry, Topology, and Physics; session on Applications of Topology. Lisbon, Portugal. February 2015.

*Map Construction and Comparison Using Local Structure.* Workshop on Topological Data Analysis. SAMSI, Research Triangle Park, NC. February 2014.

*The Intersection of Statistics and Topology.* AWM Workshop for Women Graduate Students and Recent PhDs, Joint Mathematics Meetings, January 2014.

*Modes of Gaussian Mixtures.* Workshop on Topological Data Analysis and Machine Learning Theory, Banff International Research Station, October 2012.

*Persistence of Extra Modes in Gaussian Mixtures.* Workshop on Computational Topology at CG Week 2012, University of North Carolina, Chapel Hill, NC. June 2012.

*A Geometric View of Gaussian Mixtures.* Young Researcher's Forum at CG Week 2012, University of North Carolina, Chapel Hill, NC. June 2012.

*Understanding Isotropic Gaussian Mixture Models.* Discrete and Computational Geometry and Topology Workshop. IST Austria, Klosterneuburg, Austria. March 2012.

*Finding Ghost Features in Gaussian Mixture Models.* Workshop on Sphere Arrangements. Field's Institute, Toronto, Canada, Nov. 2011.

*Computing with Alice.* SIGCSE Kid's Camp, Milwaukee, WI, March 2010.

*Realizability Problems in Group Theory.* Spring Meeting of the EPADEL Section of the Mathematics Association of America. Shippensburg State University, April 2006.

## COLLOQUIA AND LECTURES

*Applied Algebraic Topology: Integrating Math, Statistics, Computer Science, and Applications.* University of Puget Sound, Tacoma, WA. Oct. 2016.

*Using TDA in Prostate Cancer Diagnosis and Prognosis.* Applied Math Seminar, Colorado State University. Fort Collins, CO. Oct. 2016.

*Persistent Local Homology in Road Network Analysis.* Topology Seminar, Pomona College. Claremont, CA. Oct. 2016.

*Finding Shape in Data.* Claremont Colleges Mathematics Colloquia (CCMC). Claremont, CA. Oct. 2016.

*The Intersection of Statistics and Topology.* Institute of Statistical Mathematics. Tachikawa, Japan. June 2014.

*Local Homology Based Distance Between Embedded Graphs.* Active Robotic Sensing Lab. North Carolina State University, Raleigh, NC. March 2014.

*Local Homology Based Distance Between Embedded Graphs.* Data Seminar. Duke University, Durham, NC. March 2014.

*From Point Clouds to Computations: How to Understand Data from the Perspective of a Topologist.* Rhodes University, Memphis, TN. October 2013.

*Gaussian Mixtures: A Common Model with Unexpected Features.* Department of Mathematics, Bremen University, Bremen, Germany. May 2013.

*Counting and Locating Ghost Modes in a Gaussian Mixture.* Department of Mathematics, University of Pennsylvania, Philadelphia, PA. January 2013.

*Metrics on Persistence Diagrams.* Discrete and Computational Geometry Summer School. Yaroslavl', Russia. July 2012.

*Ghosts in Gaussian Mixture Models.* Data Seminar. Duke University, Durham, NC. January 2012.

*Finding Ghost Features in Gaussian Mixture Models.* CMU Theory Lunch. Carnegie Mellon University, Pittsburgh, PA. Nov. 2011.

*Finding Ghost Features in Gaussian Mixture Models.* Mathematics and Computer Science Colloquium. Saint Joseph's University, Philadelphia, PA. Nov. 2011.

*What is Computational Topology?* Mathematics and Computer Science Colloquium. Saint Joseph's University, Philadelphia, PA. December, 2008.

*Realizability Problems in Group Theory.* Joint presentation with Julia Fox. Research Seminar, Program for Women in Mathematics. Institute for Advanced Study, Princeton, NJ, May 2006.

## CAMPUS TALKS

*Studying Data Through the Lens of (Persistent) Homology.* Applied Math Seminar, MSU, Bozeman, MT. Nov. 2016.

*A Biased Introduction to Computational Topology.* Graduate Student Colloquium. Mathematics Department, Tulane University, New Orleans, LA. March 2014.

*Persistent Homology.* Topology Seminar. Mathematics Department, Tulane University, New Orleans, LA. Sept. 2013.



*Modes of Gaussian Mixtures.* CMU Statistical Machine Learning Reading Group, Carnegie Mellon University, Pittsburgh, PA. October 2012.

*Realizability Problems in Group Theory.* Mathematics Awareness Day. Saint Joseph's University, Philadelphia, PA. March 2006.

*Teaching with Alice.* Joint presentation with John Paul Craig. Summer Research Seminar. Saint Joseph's University, Philadelphia, PA. August 2004 and 2005.

*Alice.* Joint presentation with John Paul Craig. Mathematics Awareness Day, Saint Joseph's University. March 2005.

POSTER  
PRESENTATIONS

*American Indian Storytelling with Alice.* Co-authored poster with Jachi Madubuko\*, Sam Micka, Allison Theobald (Presented by Sam Micka). SIGCSE, Feb. 2018.

*Topological Descriptors for Quantitative Prostate Cancer Morphology Analysis.* Co-authored poster with Pete Lawson, Eric Berry, J. Quincy Brown, BTF, and Carola Wenk. (Presented by Pete Lawson). Conference on Digital Pathology, SPIE Medical Imaging. Feb. 2017. **Honorable Mention, Digital Pathology Poster Award**

*Persistent Homology for Pan-Genome Analysis.* Co-authored poster with Alan Cleary, BTF, Thiruvarangan Ramaraj, Joann Mudge, and Brendan Mumey. (Presented by BTF). WinCompTop, Institute for Mathematics and its Applications, Minneapolis, MN. August 2016.

*Persistent Homology for Pan-Genome Analysis.* Co-authored poster with Alan Cleary, BTF, Thiruvarangan Ramaraj, Joann Mudge, and Brendan Mumey. (Presented by Alan Cleary). Sequencing, Finishing, and Analysis in the Future (SFAF), Santa Fe, NM. June 2016.

*On Minimum Area Homotopies.* BTF, S. Karakoç, C. Wenk, Topology, Geometry, and Data Analysis Conference (TGDA), Ohio State University, May 2016.

*Towards an Automated Quantitative Diagnosis of Prostate Cancer.* BTF, Q. Brown, P. Lawson, C. Miller, and C. Wenk. (Presented by BTF). BD2K All-Hands Grantee Meeting, NIH, November 2015.

*Statistical Inference for Persistent Homology.* SSE Research Day, School of Science and Engineering, Tulane University, New Orleans, LA. April 2014.

*Statistical Inference For Persistent Homology.* Joint presentation with F. Lecci. Workshop on Topological Data Analysis, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. October 2013.

*Homotopy Classification.* MathFest, Madison, WI, August 2008.

*QShuffler.* Joint presentation with Herodotos Herodotou. Graduate Student Research Day Presentation, Duke University, Durham, NC, April 2008.

*Two Classification Problems in Group Theory and Homotopy Theory.* BTF and S. Smith. (Presented by BTF). 18th Annual Student Research Symposium. Saint Joseph's U, Philadelphia, PA, April 2007.

*Visualizing Lists and Arrays.* Consortium for Computing Sciences in Colleges Southeastern Region, Lenoir Rhyne College, Hickory, NC, Nov. 2005.

*Expanding Alice.* Regional Sigma Xi Symposium, Saint Joseph's University, Philadelphia, PA, April 2005.

*Expanding Alice.* Celebration of Student Scholar Activities, Saint Joseph's University, Philadelphia, PA, Sept. 2005.

*Alice.* Celebration of Student Scholar Activities, Saint Joseph's University, Philadelphia, PA, Sept. 2004.

## BOOK REVIEWS

*The Structure and Stability of Persistence Modules* by F. Chazal, V. de Silva, M. Glisse, and S. Oudot. Review by R. Belton and BTF. ACM SIGACT News, June 2017.

*Polyhedral and Algebraic Methods in Computational Geometry* by M. Joswig and T. Theobald. Review by BTF and D. L. Millman. ACM SIGACT News, 2015.

*How to Fold It* by J. O'Rourke. Review by BTF and David L. Millman. ACM SIGACT News, Sept. 2013.

*Geometric Algebra: an Algebraic System for Computer Games and Animation* by J. Vince. Review by BTF and D. L. Millman, ACM SIGACT News, March 2011.

*Geometric Folding Algorithms: Linkages, Origami, Polyhedra* by E. D. Demaine and J. O'Rourke. Review by BTF and D. L. Millman. ACM SIGACT News, March 2011.

*Higher Arithmetic: An Algorithmic Introduction to Number Theory* by H. Edwards. Review by BTF and D. L. Millman. ACM SIGACT News, June 2009.

*Geometric Algebra for Computer Science* by L. Dorst, D. Fontijne, and S. Mann. Review by BTF and D. L. Millman. ACM SIGACT News, Dec. 2008.

## EVENT ORGANIZATION

HerbertFest, a celebration of Herbert Edelsbrunner's 60th Birthday. Co-organizers BTF, Dmitriy Morozov, Amit Patel, and Yusu Wang. Summer 2017. Details TBA.

Applications of Algebraic Topology, minisymposium at the SIAM Central States Meeting. Co-organizers BTF and Lori Ziegelmeier. Colorado State University, Oct. 2017.

Statistics and Applied Algebraic Topology, minisymposium at the SIAM Conference on Applied Algebraic Geometry. Co-organizers BTF and Sayan Mukherjee. Georgia Tech, Aug. 2017.

From Observations to Prediction of Movement. Dagstuhl seminar. Co-organizers Mark Birkin, Somayeh Dodge, BTF, Richard Mann. Germany, Jul. 2017.

Workshop for Women in Computational Topology (WinCompTop). Co-organizers Erin Chambers, BTF, Lori Ziegelmeier. IMA, Minneapolis, MN. Aug. 2016.

Mini-symposium on Computational Topology, workshop during CG Week. Co-organizers BTF, Elizabeth Munch, Don Sheehy. TU Eindhoven, Netherlands, Jun. 2015.

## COMMITTEES

Steering Committee, Women in Computational Topology, 2016–present.

Workshop Committee, CG Week (SoCG) 2018.

## OTHER PROFESSIONAL SERVICE

Referee, ACM Symposium on Theory of Computing (STOC); 2018.

- Referee, Discrete and Computational Geometry (DCG); 2011, 2015, 2018.
- Referee, ACM Symposium on Computational Geometry (SoCG); 2011–2013, 2015–2018.
- Referee, IEEE Transactions on Knowledge and Data Engineering; 2018.
- Referee, ALENEX; 2017.
- Poster Committee, Grace Hopper Conference; 2015–2018.
- Referee, ACM-SIAM Symposium on Discrete Algorithms (SODA); 2016.
- Referee, International Symposium on Algorithms and Data Structures (WADS); 2015.
- Referee, ACM SIGSPATIAL GIS; 2015.
- Referee, International Symposium on Spatial and Temporal Databases (SSTD); 2015.
- Referee, Journal of the ACM; 2013.
- Referee, Proceedings of the Japan Academy; 2011.
- Referee, Inverse Problems special issue on Topological Data Analysis; 2011.
- MAA American Mathematics Competition (AMC) Advisory Panel; 2010.
- Referee, ACM Special Interest Group on Graphics and Interactive Techniques (SIGGRAPH); 2010.
- UNIVERSITY SERVICE
- Organizer, Computer Science Seminar, AY 2017–2018.
- Adviser (and Founding Member), Upsilon Pi Epsilon (UPE) Honor Society, MSU, 2017–present.
- Committee Member, Undergraduate Curriculum, GSoC, 2015–present.
- Adviser, Association for Women in Computing (AWC), MSU, 2015–present.
- Adviser, TDA at MSU (research seminar and student club), MSU, 2015–present.
- Committee Member, Academic Integrity, COE, AY 2016–2017.
- Committee Member, Faculty Search (NTT and TT), GSoC, AY 2016–2017.
- Committee Member, Computer Science B.A., GSoC, AY 2016–2017.
- Re-founding Member, Upsilon Pi Epsilon (UPE), Tulane University, 2015.
- ART
- CAVE: An Artscience Installation.* The NeuroCave Collaborative. Holter Museum of Art, August 2017–December 2017.
- Art-Math Display.* The curious construction conclave, 2014. On display, Museum of Mathematics (MoMath), New York City.