KATHARINE F. GURSKI

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Annex III

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RESEARCH INTERESTS

Modeling physical and biological problems using analytical and computational techniques. Concentration in fluid dynamics using tools from differential equations and numerical analysis.

EDUCATION

Ph.D. in Applied Mathematics, University of Maryland, College Park, August 1999
Thesis Title: Decay Rates of Internal Waves in Viscous Near-Critical Fluids
Advisor: Professor Robert Pego
M.S. in Applied Mathematics, University of Illinois at Urbana-Champaign, 1991
M.S. in Physics, University of Illinois at Urbana-Champaign, 1989
B.S. in Physics, Emory University, Atlanta, Georgia 1987, Summa Cum Laude

EXPERIENCE

Professor — Howard University, D.C.
August 2020 – present — Graduate School Faculty
Associate Professor
August 2013 – August 2020
Assistant Professor
August 2008 – August 2013
Co-Director of Graduate Studies
October 2012 - July 2015, August 2018 - September 2019

Assistant Professor (Contract) — George Washington University, D.C.
June 2003 – August 2008

Guest Researcher — National Institute for Standards and
January 2003 – 2010 — Technology, Gaithersburg, MD
National Research Council Research Associate
January 2001 - January 2003

Adjunct Faculty, Instructor of Mathematics — Marymount University, Arlington, VA
January 2003 - May 2003

Postdoctoral Fellow — NASA Goddard Space Flight Center
August 1999-December 2000 — Greenbelt, MD
Fellowship funding contracted through:
Universities Space Research Association, Caelum Research Corporation, University of Maryland, Baltimore County

PUBLICATIONS

Articles in Refereed Journals

1. K.F. Gurski, Y. Kang, Y. And Ma, *A Darwinian model for the evolution of drug resistance to long-acting PrEP during an early HIV infection*, PLOS One, PLOS ONE 21(8): e0355833 (2026). https://doi.org/10.1371/journal.pone.0355833
2. S.J. Gutowska, K.A. Hoffman, and K.F. Gurski, *Improving Adherence to a Daily PrEP Regimen Is Key When Considering Long-Time Partnerships*, Journal of Biological Dynamics, 18(1), Article: 2390843, August 2024, https://doi.org/10.1080/17513758.2024.2390843
3. A. Fernando, K. Gurski, T. Ma, *A Research Introduction for Early College Students: Based on the OSU-HBCU Pilot Program*, 2024, 1–19.PRIMUS, https://doi.org/10.1080/10511970.2024.2396497.
4. K.F. Gurski and K.A. Hoffman, *Staged HIV Transmission and Treatment in a Dynamic Model with Long-term Partnerships*, Journal of Mathematical Biology, 86(5):74 (2023). https://doi.org/10.1007/s00285-023-01885-w
5. O. Prosper, K. Gurski, M.I. Teboh-Ewungkem, A, Peace, C. Manore, M. Grogan, and Z. Feng, *Modeling seasonal malaria transmission: A methodology connecting regional temperatures to mosquito and parasite developmental traits*, 2023, *Letters in Biomathematics* 10 (1), 3–27. DOI:10.30707/LiB10.1.1682014077.793816
6. Naomi Rankin (Advisor: Katharine Gurski), *An Agent-Based Model of COVID-19 on the Diamond Princess Cruise Ship,* SIAM Undergraduate Research Online, Published electronically September 29, 2022, DOI: 10.1137/21S1462520
7. S. Gutowska, K. Hoffman, K.F. Gurski, *The effect of PrEP uptake and adherence on the spread of HIV in the presence of casual and long-term partnerships*, Mathematical Biosciences and Engineering, 2022, Volume 19, Issue 12: 11903-11934. doi: 10.3934/mbe.2022555
8. B. Batista, D. Dickenson, K. Gurski, M. Kebe, N. Rankin, *Minimizing Disease Spread on a Quarantined Cruise Ship: A Model of COVID-19 with Asymptomatic Infections,* Mathematical Biosciences, Volume 329, November 2020, 108442, doi 10.1016/j.mbs.2020.108442
9. Z. Feng, K. Gurski, O. Prosper, M. Teboh-Ewungkem, M. Grogan, *A mosquito-borne disease model with non-exponentially distributed infection and treatment stages*, Journal of Dynamics and Differential Equations, (2020). 10.1007/s10884-020-09863-2
10. V. Florinski, D.S. Balsara, S. Garain, K.F. Gurski, *Technologies for supporting high-order geodesic mesh frameworks for computational astrophysics and space sciences*, Computational Astrophysics and Cosmology, 7, 1 (2020). https://doi.org/10.1186/s40668-020-00033-7.
11. K.F. Gurski*, A Sexually Transmitted Infection Model with Long-term Partnerships in Homogeneous and Heterogenous Populations,* Infectious Disease Modelling, Volume 4, 2019, Pages 142-160. https://doi.org/10.1016/j.idm.2019.05.002
12. D.S. Balsara, V. Florinski, S. Garain, S. Subramanian, K.F. Gurski, *Efficient, Divergence-Free, High Order MHD on 3D Spherical Meshes with Optimal Geodesic Meshing,* Monthly Notices of the Royal Astronomical Society, Volume 487, Issue 1, July 2019, Pages 1283–1314, https://doi.org/10.1093/mnras/stz1263
13. C.A. Manore, M.I. Teboh-Ewungkem, O. Prosper, A.L. Peace, K. Gurski, Z. Feng, *Intermittent Preventive Treatment (IPT): Its role in averting disease-induced mortalities in children and in promoting the spread of antimalarial drug resistance,* Bulletin of Mathematical Biology, 2019 Jan;81(1):193-234. doi: 10.1007/s11538-018-0524-1. Epub 2018 Oct 31.

14. Beckman, N. G., C. E. Aslan, H. R. Rogers, O. Kogan, J. L. Bronstein, J. M. Bullock, F. Hartig, J. HilleRisLambers, Y. Zhou, D. Zurell, J. F. Brodie, E. M. Bruna, R. S. Cantrell, R. Decker, E. O. Effiom, E. C. Fricke, K. Gurski, A. Hastings, J. Johnson, B. A. Loiselle, M. N. Miriti, M. G. Neubert, L. Pejchar, J. R. Poulsen, G. Pufal, O. H. Razafindratsima, M. Sandor, K. Shea, S. J. Schreiber, E. W. Schupp, R. S. Snell, C. Strickland, and J. Zambrano, A*dvancing an interdisciplinary framework to study seed dispersal ecology*, AoB PLANTS, Volume 12, Issue 2, April 2020, plz048, https://doi.org/10.1093/aobpla/plz048
15. Clare Aslan, Noelle G Beckman, Haldre S Rogers, Judie Bronstein, Damaris Zurell, Florian Hartig, Katriona Shea, Liba Pejchar, Mike Neubert, John Poulsen, Janneke HilleRisLambers, Maria Miriti, Bette Loiselle, Edu Effiom, Jenny Zambrano, Geno Schupp, Gesine Pufal, Jeremy Johnson, James M Bullock, Jedediah Brodie, Emilio Bruna, Robert Stephen Cantrell, Robin Decker, Evan Fricke, Katie Gurski, Alan Hastings, Oleg Kogan, Onja Razafindratsima, Manette Sandor, Sebastian Schreiber, Rebecca Snell, Christopher Strickland, Ying Zhou, *Employing plant functional groups to advance seed dispersal ecology and conservation*, AoB PLANTS, Volume 11, Issue 2, April 2019, plz006, https://doi.org/10.1093/aobpla/plz006
16. K.F. Gurski and K.A. Hoffman, *Influence of Concurrency, Partner Choice, and Viral Suppression on Racial Disparity in the Prevalence of HIV Infected Women*, Mathematical Biosciences, 282 (2016) 91–108. doi: 10.1016/j.mbs.2016.09.009
17. E.K. Thomas, K.F. Gurski, and K.A. Hoffman, *Analysis of SI Models with Multiple Interacting Populations using Subpopulations*, Mathematical Biosciences and Engineering, Mathematical Biosciences and Engineering, 2015 Feb; 12(1):135-61. doi:10.3934/mbe.2015.12.135.
18. K.F. Gurski, *A Stability and Cost Study of Explicit Super and Dyadic Time Stepping for Stiff Nonsymmetric Problems*, AIP Conference Proceedings 1368 (2011) pp. 239-242. DOI: 10.1063/1.3663503
19. K.F. Gurski, *A Stability and Cost Study of Explicit Super and Dyadic Time Stepping for Stiff Nonsymmetric Problems*, AIP Conference Proceedings 1368 (2011) pp. 239-242. DOI: 10.1063/1.3663503
20. K.F. Gurski and S. O'Sullivan, *A Stability Study of a New Explicit Numerical Scheme for a System of Differential Equations with a Large Skew-Symmetric Component*, SIAM J. Numerical Analysis, 49 (2011), No.1, pp. 368-386. DOI: 10.1137/090775804
21. K.F. Gurski and S. O'Sullivan, *An explicit super-time-stepping scheme for non-symmetric parabolic problems*, AIP Conference Proceedings, 1281 (2010), issue 1, pp. 761-764.
22. K.F. Gurski, Secret Message Decryption: *Group Consulting Projects Using Matrices and Linear Programming*, PRiMUS – Problems, Resources and issues in Mathematical Undergraduate Studies, Volume 19, Issue 2, March-April, pp. 194-204, 2009.
23. K.F. Gurski, *A Comparison of Two Intermediate State HLLC Solvers for Ideal Magnetohydrodynamics*, Numerical Modeling of Space Plasma Flows: Astronum 2007, ASP Conference Series vol. 385, eds N.V. Porelov, E. Audit, and G.P. Zank, San Francisco: Astronomical Society of the Pacific, pp. 253-258, 2008.
24. G.B. McFadden, S.R. Corriel, K.F. Gurski and D.L. Cottrell, *Convective Instabilities in Two Liquid Layers*, Journal of Research of the National Institute of Standards and Technology, vol. 112, pp. 271-281, 2007.
25. G.B. McFadden, S. Corriel, K.F. Gurski, and D.L. Cottrell*, Onset of Convection in Two Liquid Layers with Phase Change,* Physics of Fluids, vol. 19, 104109, 2007.

26. K.F. Gurski, G.B. McFadden, and M.J. Miksis, *The Effect of Contact Lines on the Rayleigh Instability with Anisotropic Surface Energy*, SIAM Journal of Applied Mathematics, Vol. 66, Num. 4, pp. 1163-1187, 2006.
27. K.F. Gurski, *An HLLC-type Approximate Riemann Solver for Ideal Magnetohydrodynamics*, SIAM Journal of Scientific Computing, Vol. 25, Num. 6, pp. 2165-2187, 2004.
28. K.F. Gurski, R. Kollar, and R.L. Pego, *Slow Damping of Internal Waves in Stably Stratified Fluid*, Proceedings of the Royal Society of London, Apr. 8, 2004, 460, (2044), pp. 977-994.
29. K.F. Gurski and G.B. McFadden, *The Effect of Anisotropic Surface Energy on the Rayleigh Instability*, Proceedings of the Royal Society of London, Series A, Oct. 8, 2003, 459 (2038) pp. 2575-2598.
30. K.F. Gurski and R.L. Pego, *Normal Modes for a Stratified Viscous Fluid Layer*, Royal Society of Edinburgh, 132A, pp. 1-15, 2002.
31. K.F. Gurski and R.L. Pego, *Decay Rates of Internal Waves in a Fluid Near the Liquid-Vapor Critical Point*, Physical Review E, July 1, 2000, Volume 62, Number 1, pp. 517-524.

Book Chapters

32. K.F. Gurski, K. Hoffman, S. Gutowska, B. Berlinda, *Modeling HIV and HSV-2 using partnership models*, in Contemporary Research in Mathematical Biology (eds. S. Cantrell, M. Martcheva, A. Neval, S. Ruan and Z. Shuai), World Scientific, January 2027, https://doi.org/10.1142/12639
33. Y. Ma, Y. Kang, A. Davenport, K. Link, J. Aduamah, K. Gurski (2024), *Extended-release Pre-Exposure Prophylaxis and Drug Resistant HIV.* In: Ford Versypt, A.N., Segal, R.A., Sindi, S.S. (eds) Mathematical Modeling for Women's Health. The IMA Volumes in Mathematics and its Applications, vol 166. Springer, Cham. https://doi.org/10.1007/978-3-031-58516-6_2
34. M. Teboh-Ewungkem, O. Prosper, K. Gurski, C. Manore, A. Peace, and Z. Feng, *The Role of Intermittent Preventive Treatment (IPT) and the Spread of Drug Resistant Malaria*, T. Jackson, A. Radunskaya (eds.), Applications of Dynamical Systems in Biology and Medicine, The IMA Volumes in Mathematics and its Applications 158, DOI 10.1007/978-1-4939-2782-1 (Refereed)
35. H. Zullo, K. Cline, M. Parker, R. Buckmire, J. George, K. Gurski, J. Larsen, B. Mellor, J. Oberweiser, D. Peterson, J. Scharf, R. Spindler, A. Stewart, and C. Storm, *Student Surveys: What Do They Think?,* in Teaching Mathematics with Classroom Voting: With and Without Clickers, eds. H. Zullo and K. Cline, MAA Notes Series, 2012.

Other Technical Papers

36. K.F. Gurski and G.B. McFadden, *The Effect of Anisotropic Surface Energy on the Rayleigh Instability*, National Institute of Standards and Technology, Internal Report #6892 (2002).
37. *Decay Rates of Internal Waves in Viscous Near-Critical Fluids*, Ph.D. thesis, June 1999.
38. *Percolation in Correlated Growth Clusters*, undergraduate honors thesis, May 1987.

Non Technical Articles

39. K Gurski, A. Peace, O. Prosper, T. Stepien, M.I. Teboh-Ewungkem, *Mathematicians Navigating Parenthood: Lessons Learned, Methodologies, and Useful Solutions that were Beneficial During the COVID-19 Pandemic*. *Notices of the American Mathematical Society* 69 (11), January 2023 .https://par.nsf.gov/biblio/10391139.

40. K.F. Gurski, *Hints for Finding Non-Academic Research Positions (Postdoctoral and Permanent)*, Association for Women in Mathematics Newsletter, Vol. 31, No. 5, September-October 2001, pp.17-19.
41. K.F. Gurski, *WIM Talk Series*, Association for Women in Mathematics Newsletter, Vol. 27, No. 3, May-June 1997, p. 9.

Proceedings Papers (Non refereed)

42. K. Whittaker and K. Gurski, *Moment-generating functions for tenable two-label polya urns,* ASA Proceedings of the Joint Statistical Meetings 2009, pp.3436-3444.
43. K.F. Gurski, R. Kollar, and R.L. Pego, *Damping of Internal Waves in a Stably Stratified Flow of Two- and Three-Dimensions*, extended abstract, Proceedings of the Women in Mathematics: The Legacy of Ladzhenskaya and Oleinik Workshop at the Mathematical Sciences Research Institute, May 18-20, 2006.
44. D. Ambrose, C.G. Fournelle, K.F. Gurski, D. Peng, V. Shekar, and V. Varghese, *Determining Addition Rates for the Growth of Uniform Silver Halide Crystals*, Proceedings for the Mathematical Modeling in Industry Workshop for Graduate Students, Institute for Mathematics and Its Applications, July 22-31, 1998.
45. K.F. Gurski, P. Hagerty, M. Hasson, M. Moisan, C. Perez, *Extracting Meteorological Data from a Projectile Trajectory*, Proceedings for the Industrial Mathematics Modeling Workshop for Graduate Students, Editor J. Scroggs, Center for Research in Scientific Computation, August 3-13, 1997.
46. A. Crowe, K.F. Gurski, J. Pelesko, and J. Spencer, *Improved Estimation of Heat Transfer Characteristics of a Power Condenser*, Proceedings for the Claremont Colleges Mathematics Modeling Workshop for Graduate Students, June 5-15, 1994.

HONORS AND AWARDS

Association for Women in Mathematics, 2026 Class of AWM Fellows
April 2021 COAS Distinguished Faculty Award, category: Outstanding Scholarship, Full Professor
National Science Foundation Research Grant, September 2020- August 2024
Center for Undergraduate Research Grant, May 2020 - May 2021.
National Science Foundation Research Grant, September 2018- August 2022
National Science Foundation Research Grant, July 2014- June 2018
Collaboration Grant for Mathematics, Simons Foundation, September 2012-August 2018
Summer Faculty Research Fellowship, Office of the Provost, Howard University, 2012
New Faculty Startup Fellowship, Office of the Provost, Howard University, 2009-2011
Academic Excellence grant, Office of the Provost, Howard University, 2009-2010
Project NExT Fellow sponsored by the American Mathematical Society for 2004-2005
Junior Scholar Incentive Award from Columbian College of Arts & Sciences at George Washington University, Summer 2004
National Research Council Research Associate Fellowship, January 2001 – January 2003

INVITED WORKSHOPS

- AIM SQuaRES leader, American Institute for Mathematics, Malaria in Children: Seasonal Prevention, Acquired Immunity and Drug Resistance, 2025-2027

- Workshop: Research In Biomathematics: A Guide To Funding From The U.S. Army Research Office, Portland, Oregon, June 11, 2024.
- Symposium on BEER, Biomathematics and Ecology Education and Research, VCU, October 2023
- OSU-HBCU Mathematical Biology Workshop, Ohio State University,May 29 - June 2, 2023
- Mid-Atlantic Math Biology (MAMBio) Day, Brin Mathematics Research Center, University of Maryland College Park, April 2024..
- Mathematics of Malaria Transmission Dynamics, Brin Mathematics Research Center, University of Maryland College Park, November 2024.
- WIMB Group Leader: Women in Mathematical Biology at the Institute of Mathematics and Its Applications, June 2022.
- Center for Undergraduate Research Faculty Training Meeting, May 20-21, 2020.
- AIM SQuaRES leader, American Institute for Mathematics, Linking Pharmacokinetics to Epidemiological Models of Vector-Borne Diseases and Drug Resistance Prevention, 2019-2024.
- Identifiability Problems in Systems Biology Workshop at American Institute of Mathematics, August, 2019.
- AIM SQuaRES leader, American Institute for Mathematics, 2015-2017, Intermittent preventive treatment and the spread of drug resistant malaria.
- Neglected Infectious Diseases Workshop at American Institute of Mathematics, August 2014.
- WhAM: Women in Applied Mathematics Workshop at the Institute of Mathematics and Its Applications, September 2013.

GRADUATE STUDENT RESEARCH

1. PhD Student, Gloria Ampiah Danso, Math Modeling: Disease Resistant Mutations, in progress.
2. PhD Student, Aaliyah Bratcher, Multi-strain and Age Structure Effects, Within Host HIV, in progress.
3. PhD Student, Maliha Noushin, UMBC, Co-Advising with Dr. Kathleen Hoffman, Multiscale Model of Within and Between Host HIV, in progress.
4. PhD Student, Sylvia Gutowska, UMBC, Co-Advised with Dr. Kathleen Hoffman, Mathematical Epidemiology: Modeling an HIV Prophylaxis Intervention. Graduated May 2023.
5. MS Student, Berlinda Batista, Thesis Title: A Study of Pair Formation Disease Models with a Two Phase Infection, graduation May 2019.
6. PhD Student, Martin Arienmughare, Thesis Title: Three, Four-Wave HLLC Riemann solver for single and multiphase flow, and the classical and semi-relativistic CGL-MHD, graduation May 2016.
7. PhD Student, Evelyn Thomas, Thesis advisor along with Dr. Kathleen Hoffman of University of Maryland Baltimore County, Thesis Title: The Effect of Male Bisexuality on Incurable Sexually Transmitted Diseases graduation May 2012
8. Master Students: Malick Kébé and Nyjah Grant, Research project: Numerical Quadrature with Retrievable Moments in Two Dimensions, Spring 2018.
9. Graduate: Drew Dickenson, Super-Time-Step Calculations for Non Symmetric and Skew-Symmetric Dominated Systems: STS-RKC, STS-RKL, August 2020- December 2021.

UNDERGRADUATE STUDENT RESEARCH

1. Undergraduates: Jordan Banks, Micah Watkins, and Madison Simmons, Simplifying Malaria Parasite and Immune System Models, Fall 2024-Spring 2025.
2. Undergraduates: Jordan Banks, Autumn Edwards, Sarai Sales, Modeling the Effects of Microgravity on the Heart, Fall 2023-Spring 2024.
3. Undergraduate: Araj Shah, Python Codes for Sobol Sampling and Parameter Estimation, Fall 2023.
4. Ohio State University - HBCU Pilot Research Program Fall 2022- Spring 2023 with 1 week REU in May 2023. Goal: to encourage undergraduate students at the HBCUs to pursue graduate school in the STEM disciplines; 2) to connect math faculty at the HBCUs to faculty and research programs at OSU and other large research institutions; 3) to experiment with virtual colloquia and virtual teaching techniques in mathematics. There were six HBCUs selected for this pilot program: Howard University, Xavier University of Louisiana, Clark Atlanta University, Norfolk State University, Texas Southern University, and Morgan State University.
5. Undergraduates: Rashyan DeFoe, Biraj Dahal, Julian Francis, Alana Lewis, Araj Shah, Within-Host HIV, Parameter Identifiability, RNA-DNA Mutations, Fall 2022- Spring 2023.
6. Undergraduates: Diego Martinez and Kenthia Roberts, Within-Host HIV, Parameter Identifiability, Fall 2022.
7. Undergraduates: Julian Francis, Diego Martinez, Naomi Rankin, and Malik Woullard, Comparison of Within-Host HIV Models, Fall 2021-Spring 2022.
8. Undergraduate: Naomi Rankin, An Agent Based Model of COVID-19 on the Diamond Princess Cruise Ship, Fall 2020 - Fall 2021, Senior Thesis 2022.
9. Undergraduates: Lauren Jackson and Ashley Oaks, Graphically Modelling HIV Infection, Fall 2020 - Spring 2021.
10. Undergraduates: Jayshawn Cooper, Tiana Lockhart, and Mateyo Waluye, Summer REU 2014, Modeling HIV/AIDS Transmission Through Heterosexual Sexual Contact Using Several HIV Stages.
11. Undergraduates: Lauren Prince and Lotanna Ikeotuonye, Classifying Placenta Shapes, Fall 2011- Fall 2012, Modeling the Flu and Vampire viruses, Spring 2013.
12. Undergraduate: Lauren Prince, Using an SIR Model to Understand the Conditions that Cause Staphylococcus Aureus to Develop Resistance to Certain Treatments, senior thesis, May 2014.
13. Undergraduate: Lotanna Ikeotuonye, Mathematical Analysis Modeling of Malaria Transmission in Nigeria, senior thesis, May 2014.
14. Undergraduate: Blanche Mahop, Sensitivity Analysis: Extended Fourier Amplitude Sensitivity Test, senior thesis, May 2014.
15. Undergraduate: Arayna Spratley, Predicting Patterns with *N* Frogs in a Leapfrog Game, Spring 2013.

CONFERENCE AND CONFERENCE SESSIONS ORGANIZED

- A Showcase of Research Mathematicians who graduated from the Summer Program for Women in Mathematics: 1995-2013. In honor of Murli Gupta, JMM January 2026, Organizing with Dr. Rebecca RG

- Society of Mathematical Biology Annual Meeting, Seoul, South Korea, June 2024, Minisymposium (4 sessions), Organizer with Joon Ha, Yeona Kang, Miranda Teboh-Ewungkem
- AWM Research Symposium, Atlanta, September 2023, Minisymposium (2 sessions), Organizer with Yeona Kang
- Society of Industrial and Applied Mathematics Meeting, Dynamical Systems, Diverse Applications and Approaches in Biological Dynamics, Minisymposium (2 sessions), Organizer with Kathleen Hoffman, May 2023.
- Society of Industrial and Applied Mathematics Meeting, Life Sciences, Mathematical Models in Epidemiology and Medicine Minisymposium (2 sessions), Organizer with Kathleen Hoffman, July 14, 2022.
- Society of Industrial and Applied Mathematics Meeting, Mathematics of Planet Earth, Temperature and Climatic Impacts on Disease Dynamics, Transmission and Spread Minisymposium, Organizer with Miranda Teboh-Ewungkem, July 13, 2022.
- JMM Workshop Mathematicians Navigating Parenthood, Organizer with Olivia Prosper, Angela Peace, Tracy L Stepien, Miranda Ijang Teboh-Ewungkem, April 8, 2022
- Society of Mathematical Biology Annual Meeting, Women in Mathematical Epidemiology, Organizer with Kathleen Hoffman, June 17, 2021
- JMM, SIAM Minisymposium on Using Mathematical Models in Epidemiology and Medicine to Outwit Diseases Organizer with A. Yakubu, Jan. 2021.
- AMS Special Session on Women in Mathematical Biology, Minisymposium Organizer with Christina Edholm, Amanda Laubmeier, Heather Zinn Brooks, January 2020, Joint Mathematics Meetings
- NSF-CBMS Conference on Mathematical Biology: Modeling and Analysis at Howard University, Organizing committee. May 21-25, 2018
- Infinite Possibilities, Conference for Women of Color in Mathematics and Statistics, Local organizer. April 14-15, 2018, sponsored by MSRI.
- Howard University Math Modeling in Biology & Medicine Workshops , Organizing committee for the December 2015, April 2016, December 2016, April 2017, December 2021, April 2022
- CCICADA Annual Meeting , Organizing committee. May 18 and 19, 2017.
- AMS Sectional Meeting at University of Richmond, Minisymposium Organizer with Kathryn Trapp, November 2010.

INVITED PRESENTATIONS (Recent)

1. Forecasting Malaria using test positivity and reported case rates, Society of Mathematical Biology Annual Meeting, University of Graz, Austria, July 2026.
2. Parameter Sensitivity, Identifiability, and Estimation for a Data-Driven Model of Malaria, Biology and Medicine through Mathematics (BAMM!) Conference,VCU, May 2026.
3. Capturing Heterogeneity in Malaria: A PK-PD Immuno-Epidemiology malaria model with non-exponential waiting times, Joint Mathematics Meetings, January 2026.
4. A Darwinian model for the evolution of drug resistance to long-acting PrEP during an early HIV infection, Joint Mathematics Meetings, January 2026.
5. Biomathematics and Ecology Education & Research Symposium, George Mason University, November 2025.
6. Society of Mathematical Biology Annual Meeting, Edmonton, Canada, July 2025.
7. Society of Mathematical Biology Annual Meeting, Seoul, South Korea, July 2, 2024.

8. Nonlinear Partial Differential Equations and Applications Conference, In honor of Bob Pego, May 2024
9. AMS Sectional Meeting, Mathematics of Infectious Diseases: A Session in Memory of Dr. Abdul-Aziz Yakubu, April 2024.
10. Joint Mathematics Meetings, Recent Advances in Mathematical Models of Diseases: Analysis and Computation, January 2024.
11. University of Maryland College Park, Mathematics of Malaria Transmission Dynamics, November 2023.
12. Long Acting Cabotegravir and the Emergence of Drug-Resistant HIV, Biomathematics and Ecology Education & Research Symposium, VCU, November 5, 2023.
13. Smith College, Physics Colloquium, April 21. 2023.
14. Joint Mathematics Meetings, AMS Special Session on Understanding COVID-19: Three Years of Mathematical Models to Address the Global Pandemic, Jan 2023.
15. Association for Women in Mathematics Colloquium at George Mason University, November 11, 2022.
16. University of Maryland College Park, Mathematical Biology Seminar, October 2022.
17. Mathematical Association of America Annual Meeting, Current Research in Mathematical Biology, August 5, 2022.
18. Howard University Math Modeling in Biology & Medicine Workshop on Mitigation of Future Pandemics, April 23, 2022 (virtual).
19. Joint Mathematics Meetings, AMS Special Session on Mathematical Models of Diseases: Analysis and Computation, April 8, 2022 (virtual).
10. Joint Mathematics Meetings, SIAM Minisymposium on Using Mathematical Models in Epidemiology and Medicine to Outwit Diseases, Jan 6, 2021 (virtual).
11. SIAM Life Sciences Conference, Minisymposium, June 8, 2020 (cancelled).
12. AMS Sectional Meeting, University of Charlottesville, VA March 13-15, 2020 (cancelled).
13. AWM Research Symposium, April 7, 2019, Rice University.
14. University of Maryland Baltimore County, Mathematical Biology Class/Applied Mathematics Seminar, February 11, 2019.
15. AMS Annual Meeting, January 17, 2019, Baltimore, Maryland.
16. Women's Intellectual Network Research Symposium, Department of Mathematics, University of Virginia, September 5, 2018.
17. Society of Mathematical Biology Annual Meeting, University of Sydney, Australia, July 9, 2018.
18. Biology and Medicine Through Mathematics Conference at Virginia Commonwealth University, May 30, 2018.
19. AMS Sectional Meeting at Ohio State University, March 17, 2018.
20. Howard University Math-Bio Workshop on Infectious Diseases, December 3, 2016.
21. Society of Industrial and Applied Mathematics Conference on Mathematics of Planet Earth, September 30, 2016.
22. Biology and Medicine Through Mathematics Conference at Virginia Commonwealth University, May 20, 2016.
23. University of Maryland Baltimore County Applied Mathematics and Statistics Department Colloquium, April 29, 2016.

GRANT SUPPORT

Current and Past Grants

- Modeling HIV Drug Resistance Through a Biochemical-Immunological Lens, (Co-PI),National Science Foundation, ($1,065,309) September 2026-August 2029.
- Malaria in Children: Seasonal Prevention, Acquired Immunity and Drug Resistance, AIM SQuaRES, American Institute for Mathematics, 2025-2028 (Travel support for group of 6 researchers for 1 week each year for 3 years)
- Travel Grant from U.S. Army Research Office to participate in the workshop: Research In Biomathematics: A Guide To Funding From The U.S. Army Research Office, Portland, Oregon, June 10-12, 2024.
- Supplement: Excellence in Research: Mathematical Analysis of the Prevention of HIV with PrEP and HAART Treatment, National Science Foundation ($34,119) June 2022.
- Excellence in Research: Mathematical Analysis of the Prevention of HIV with PrEP and HAART Treatment, National Science Foundation ($344,856) September 2020-August 2024.
- Exploring Mathematical Epidemiology with a Simple Within-Host HIV Model for Emerging Drug Resistance, Center for Undergraduate Research in Mathematics, May 2020- 05/2021, $5500.
- Collaborative Research: Linking Pharmacokinetics to Epidemiological Models of Vector-Borne Diseases and Drug Resistance Prevention, National Science Foundation ($199,999) September 2018-August 2022.
- Explicit Methods for Extended Time Stepping in Stiff Nonsymmetric Problems, Simons Foundation, Collaboration Grant for Mathematics, ($35,000), September 2012-August 2018.
- Focused Research Group: Collaborative Research: Developing Mathematical Algorithms for Adaptive, Geodesic Mesh MHD for use in Astrophysics and Space Physics, National Science Foundation July 2014-June 2018 ($273,146)
- Linking Pharmacokinetics to Epidemiological Models of Vector-Borne Diseases and Drug Resistance Prevention, AIM SQuaRES, American Institute for Mathematics, 2019-2021 (Travel support for group of 6 researchers for 1 week each year for 3 years)
- Intermittent Preventive Treatment and the Spread of Drug Resistant Malaria, AIM SQuaRES, American Institute for Mathematics, 2015-2018 (Travel support for group of 6 researchers for 1 week each year for 3 years)
- REU: The Summer Program in Research and Learning, Mathematical Association of America, April 2014-March 2015 ($27,500)
- REU: The Summer Program in Research and Learning, National Security Administration, April 2014-March 2015 ($120,000)
- HU-ADVANCE-IT writer's workshop participant, March 2017, November 2015, February 2014.
- Graduate Assistance in Areas of National Need (GAANN) Fellowship Program, US Department of Education, August 2012-August 2015 ($401,610)
- Summer Faculty Research Fellowship, Office of the Provost, Howard University, 2012 ($15,000)
- Subcontract awarded by George Washington University, for Assistant Director duties for Summer Program for Women in Mathematics, Grant from National Security Agency, July 2010 – June 2012 ($47,407)
- Fund for Academic Excellence, Office of the Provost, Howard University, July 2009- June 2010 ($5175).
- New Faculty Start-Up program, Office of the Provost, Howard University, July 1, 2009- June 30, 2011 ($50,000).

- Grant awarded by Columbian College of Arts and Sciences, George Washington University, with H. Mahmoud, July 2008 – June 2009 ($5,000).
- Guest Researcher, National Institute of Standards and Technology (NIST) Mathematical and Computational Sciences Group - includes office and computer support, and computer time for mathematical research, January 2003- January 2011.
- Travel Grant for Progress on Difference Equations, Virginia Commonwealth University, Richmond, VA, May 2012.
- Travel Grant from Association for Women in Mathematics for participation in AMMCS-2011 in Waterloo, Canada, July 27- 29, 2011 ($1,808).
- Travel Grant from Association for Women in Mathematics for participation in ASTRONUM-2007 in Paris, June 11- 15, 2007 ($1500).
- Travel Grant from Mathematical Sciences Research Institute for participation in workshop, May 2006.
- Travel Grant for Ninth International Conference on Dynamical Systems and Differential Equations, Orlando, Florida, American Institute of Mathematics, July 2012.

SERVICE ACTIVITIES (Last Ten Years):

Professional Service to Mathematics Community:

- National Science Foundation grant proposal review Fall 2018, Fall 2019, Fall 2021, Spring 2024, Summer 2024, Fall 2025, Spring 2026
- Reviewed Landahl Grant Applications, Society of Mathematical Biology, Spring 2024, 2026.
- Reviewed scholarship applications for 2015-2025 ACM Richard Tapia Celebration of Diversity in Computing Conferences.
- Association for Women in Mathematics, Nominating Committees, 2022-2023, 2024-2025.
- AMS-Simons Travel Grants Committee, February 2020 - 2023.
- External Reviewer for PhD theses: Arizona State University 2023, 2022; University of Buea, Cameroon, 2020.
- Summer Camp for Elementary and Middle School Students, Mathematics without Numbers Day, 2021.
- Panelist: Joint Mathematical Epidemiology and Math Education SMB Subgroup meeting, February 8, 2021 (virtual).
- Interview on CTV, Channel 42 by Khalil Shadeed on the program The Scholar's Chair. Program title: "Mathematics As the Language of the Universe" https://youtu.be/DMQYZxJCET4
- Editorial Board, *Heliyon*, Elsevier's new broad scope, open access journal, 2015-June 2020, primary editor for 65+ manuscripts.
- Reviewed papers for Computers and Mathematics with Applications, Linear Algebra and its Applications, Journal of Computational Physics, Mathematical Biosciences, Journal of Biological Dynamics, Mathematical Biosciences and Engineering, Journal of Theoretical Biology, and Springer Books
- Organized Mathematics Outreach Booth, STEM Night at Marshall Road Elementary, April 2015.
- Howard University Program: Summer Program in Research and Learning, Co-Director and led seven week REU research team, 2014.

Services to Howard University:

- 2025-2026. Strategic Planning Committee, College of Arts and Sciences.
- 2024-2025 Advisory Committee, Summer Institute with the Howard University - NHC Examinations, Humanities + STEM Faculty Institute
- 2022-2024 Just-Julian Fellowship Reviews
- 2021-2023 Hiring Committees (5), Department of Mathematics
- 2021-now Grants Advisor for the Department of Mathematics
- 2020-2023 Executive Committee, Department of Mathematics
- 2020- 2021 Hiring Committee for Atmospheric Sciences
- 2020 Organized Summer Reading Seminar: Mathematics of Pandemics
- 2018- 2019 Director of Graduate Studies
- 2019-2022 Graduate Student Selection Committee
- 2018-2019 Acting Chair of Curriculum Committee
- 2016-2018 Chair of Mathematics Department Hiring Committee
- 2017-2019 Mathematics Department Faculty Performance Committee
- 2016-2017 COAS Representative for Howard University – National Security Agency
- 2012-2015 Co-Director of Graduate Studies
- 2011-2012 Mathematics Department Curriculum Committee
- 2009-2015 Graduate Qualifying Committee for Partial Differential Equation Examinations, Real Analysis Examinations, and Ordinary Differential Equations Examinations
- 2011-2012 Blackwell Memorial Conference Committee
- 2011 Committee for Assessing Department Chair
- 2009-2012 Graduate Faculty Scheduling Committee