

JUSTIN T. WEBSTER, PH.D.

Dept. of Mathematics and Statistics \diamond University of Maryland, Baltimore County
(410) \cdot 455 \cdot 2183 \diamond websterj@umbc.edu \diamond <http://webster.math.umbc.edu/> \diamond ORCID: 0000-0002-2443-3789

EMPLOYMENT

University of Maryland, Baltimore County (UMBC), Dept. Math. and Stat.	
Associate Professor with Tenure	2022–present
Assistant Professor	2017–2022
College of Charleston (CofC), Department of Mathematics	2014–2017
Assistant Professor	

EDUCATION AND TRAINING

North Carolina State University (NCSU), Department of Mathematics	2014–2015
Postdoctoral Research Scholar, Mentor: Lorena Bociu	
Oregon State University (OSU), Department of Mathematics	2012–2014
Postdoctoral Scholar, Mentors: Ralph Showalter and Malgorzata Peszynska	
University of Virginia (UVA), Ph.D., Mathematics	2008–2012
Dissertation: <i>Analysis of Flow-Plate Interactions: Semigroup Well-Posedness and Long-Time Behavior</i>	
Advisor: Irena Lasiecka, Now: University of Memphis, Dept. of Mathematical Science	
University of San Diego (USD), B.A., Mathematics, Minor in Physics	2004–2008
Valedictorian, GPA: 4.0, Summa Cum Laude, Phi Beta Kappa (Phi of California), Inducted 2008	

AWARDS, FUNDED PROPOSALS, AND FELLOWSHIPS

UMBC BreakingGround Award	2025–2026
Grant from UMBC Center for Democracy and Civic Life	
Amount: \$2,500 to be used in funding Mathematics and Statistics Ingenuity Outreach	
UMBC Career Connector Recognition (UMBC Career Center)	2024–2025
UMBC College of Natural and Mathematical Sciences Mid-Career Faculty Excellence Award	2025
Selected as the College of Natural and Mathematical Sciences 2025 Science Discovery Series Speaker	April 2024
https://cnms.umbc.edu/discovery-series/	
NIST – <i>UMBC Quantum Science Institute</i>	2024–2026
Senior Personnel (Math&Stat Lead); PI: T. Pittman (Physics)	
Total Amount: \$1,500,000	
NSF DMS–2307538 (University Maryland, Baltimore County)	2023–2026
<i>Self-excitation, Limit Cycle Oscillations, and Control of Large Deflection Plate Models in Engineering Applications</i>	
Amount: \$290,000. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2307538&HistoricalAwards=false	
Nominated: UMBC Presidential Research Professor	2023–2024
Mathematics and Statistics (CNMS) Nominee	
Nominated: Blavatnik National Award for Young Scientists	2019–2020, 2023–2024
UMBC Nominee for <i>Physical Sciences and Engineering</i>	
Selected as GRIT-X 2023 Speaker (Office of Vice President of Research)	October 2023
https://www.youtube.com/watch?v=VR2ywToLVzI	
UMBC Strategic Awards for Research Transitions (START)	2023–2024
<i>Periodic Solutions in Fluid-Structure Interaction Problems</i> , Amount: \$20,000	
UMBC College of Natural and Mathematical Sciences Early Career Faculty Excellence Award	2022

NSF DMS–1907620 (University Maryland, Baltimore County) <i>Collaborative Research: Aeroelastic Limit Cycle Oscillations for Energy Harvesting Applications</i> UMBC Amount: \$233,000, Total Amount: \$738,000 DMS–1907620 (UMBC), DMS–1907500 (Duke), DMS–1908033 (Carnegie Mellon) https://www.nsf.gov/awardsearch/showAward?AWD_ID=1907620&HistoricalAwards=false	2019–2023
UMBC Hrabowski Innovation Grant Proposal (with Kathleen Hoffman and Kal Nanes) Amount: \$10,000; piloting “Introduction to Mathematical Reasoning” to reduce MATH 301 DFW rates	2019–2020
NSF DMS–1412238, 1504697, Supplement 1635281 <i>Analysis and Control of Mathematical Models of Fluttering Plates</i> Amount: \$120,276 https://www.nsf.gov/awardsearch/showAward?AWD_ID=1504697	2014–2017
Virginia Space Grant Consortium (NASA) Graduate Research Fellowship Amount: \$12,000 (total); Title: <i>Flow-Plate Interactions</i>	2011–2012, 2012–2013
Barry M. Goldwater Scholarship, Mathematics	2006–2008

PROPOSALS UNDER CONSIDERATION (UMBC)

NSF DMS—2606567 Applied Mathematics with: G. Avalos, University of Nebraska, Lincoln <i>Collaborative Research: Regularity, Stability, and Control of Poroelastic Filtrations</i> UMBC Amount: \$296,147	2026–2029
---	-----------

PROPOSALS NOT AWARDED (SINCE 2020)

American Association of University Women Community Action Grant In partnership with the Ingenuity Project of Baltimore Letter of Intent: <i>UMBC-Ingenuity Partnership for Women in STEM</i> Amount: \$75,000	2026–2029
NSF DMS–2150790 with: G. Avalos, University of Nebraska, Lincoln; S. Čanić, University of California, Berkeley <i>Collaborative Research: Mathematical Foundations of Fluid-Poroelastic-Structure Interactions</i> UMBC Amount: \$245,599; Total Amount: \$757,215	2025–2028
DoD MURI, AFOSR Topic 25: White Paper Lead PI: Webster, with: L. Bridgeman (Duke), S. Deffner (UMBC), E. Dowell (Duke), F. Udvardi (Univ. South. CA), W. Zhu (UMBC), M. Zavalatos (Duke) Total Amount: \$7,500,000	2023–2027
NSF ExpandQISE: Track 2 Senior Personnel/Faculty Associate with: M. Pelton (UMBC); T. Mohsenin (UMBC); S. Deffner (UMBC); T. Pittman (UMBC); E. Waks (UMCP) <i>Quantum at UMBC (QUMBC) Architectures and Devices for Resource-Efficient Quantum Networks</i> Total Amount: \$5,000,000	2023–2027
NSF-NIGMS Track 2: White paper Collaborative research: Advancing the design of a bioartificial pancreas using mathematical approaches with: S. Čanić, University of California, Berkeley; L. Bociu, North Carolina State University; and M. Bukać, Notre Dame University	2023–2025
NSF Focused Research Group, DMS–2150790 with: S. Čanić, University of California, Berkeley; L. Bociu, North Carolina State University; and M. Bukać, Notre Dame University <i>Moving boundary problems in flow-poroelasticity interactions</i> UMBC Amount: \$381,884	2022–2025
NSF DMS–1812094 (University Maryland, Baltimore County) <i>Flow-induced Instability of Nonlinear Plates: Transitional Regimes</i> Amount: \$204,695	2018–2021

with: E. Dowell, Duke University and J. Howell, Carnegie Mellon University

The Nonlinear Dynamics of a Fluttering Cantilever with Application to Energy Harvesting

Amount: \$580,403

BOOKS AND BOOK CHAPTERS

(with I. Lasiecka) *Flutter Stabilization For An Unstable, Hyperbolic Flow-Plate Interaction*, in **Fluids under Control**, Advances in Mathematical Fluid Dynamics. Birkhäuser. March, 2024. <https://link.springer.com/book/10.1007/978-3-031-47355-5>

(with B. Kaltenbacher, I. Kukavica, I. Lasiecka, R. Triggiani, and A. Tuffaha)

Mathematical Theory of Flow/Fluid-Structure Interactions. Oberwolfach Seminars, Volume 48, 2018.

<https://link.springer.com/book/10.1007/978-3-319-92783-1>

PEER-REVIEWED PUBLICATIONS

(with B. Muha, Š. Nečasová, M. Pokorný, Srdjan Trifunović) Steady Weak Solutions for A Plate Coupled to Compressible Viscous Flow with Inflow-Outflow Boundary Conditions, *to be submitted* spring 2026.

(with G. Avalos and G. Richard) Semigroup Generation for Multilayered Filtrations, *submitted* Jan. 2026.

(with G. Avalos and P. Lavagnino) Weak Solutions and Inertial Limits for Quasi-static Filtrations, *submitted* Oct. 2025.

(with M. Deliyianni and I. Lasiecka) Large Deflections of A Flow-Driven Cantilever with Kutta-Joukowski Flow Conditions, *submitted* Sep. 2025. <https://arxiv.org/abs/2509.23306>.

(with S. Mosný, B. Muha, and S. Schwarzacher) Time-Periodic Solutions for Hyperbolic-Parabolic Systems, *in revision* Sep. 2025. <https://arxiv.org/abs/2412.18801>

(with I. Benson) Resonance and Periodic Solutions for Harmonic Oscillators with General Forcing, *SIAM Review* (Education Section), *accepted* Dec. 2025. <https://arxiv.org/abs/2407.17144>.

(with G. Avalos) Uniqueness of Weak Solutions for Biot-Stokes Interactions, *Pure and Applied Analysis*, Vol. 7 (4), 2025, pp. 1111–1139. <https://msp.org/paa/2025/7-4/p05.xhtml>

(K. Hoffman, T. Williams, J.T. Webster, J. Harrison, K. Nanes) Assessing the Impact of A Interventional Proof-Writing Course, *International Journal of Mathematical Education in Science and Technology*, published online 2/2025. <https://www.tandfonline.com/doi/full/10.1080/0020739X.2025.2454604>

(with A. Falocchi) Analysis of a nonlinear fish-bone model for suspension bridges with rigid hangers in the presence of flow effects, *Discrete and Continuous Dynamical Systems*, Vol. 45 (7), 2025, pp. 2241–2280. <https://www.aims sciences.org/article/doi/10.3934/dcds.2024164>

(with V. Pata) An Observation About Weak Solutions of Linear Differential Equations in Hilbert Spaces, *Applied Mathematics and Optimization*, Vol. 90, 2024. <https://doi.org/10.1007/s00245-024-10180-z>

(with G. Avalos and E. Gurvich) Weak and Strong Solutions for a Fluid-Poroelastic-Structure Interaction via a Semigroup Approach, *Mathematical Methods in the Applied Sciences*, Vol. 48 (4), 2024, pp.4057–4089. <https://onlinelibrary.wiley.com/doi/10.1002/mma.10533>

(with L. Bociu and B. Muha) Mathematical Effects of Linear Visco-elasticity in Quasi-static Biot Models, *J. Mathematical Analysis and Application*, Vol. 527 (2), 2023. [https://authors.elsevier.com/sd/article/S0022-247X\(23\)00465-1](https://authors.elsevier.com/sd/article/S0022-247X(23)00465-1)

(with A. Balakrishna and I. Lasiecka) Strong Stabilization of a 3D Potential Flow via a Weakly Damped von Karman Plate, *Mathematical Models and Methods in Applied Sciences*, Vol. 33 (3), 2023, pp. 505–545. <https://www.worldscientific.com/doi/10.1142/S0218202523500124>

(with L. Bociu and B. Muha) Weak Solutions in Nonlinear Poroelasticity with Incompressible Constituents, *Nonlinear Analysis Real World Applications*, Vol. 67, 2022. <https://www.sciencedirect.com/science/article/pii/S1468121822000323>

(with M. Deliyianni, K. McHugh, and E. Dowell) Dynamic Equations of Motion for Inextensible Beams and Plates, *Archives of Applied Mechanics*, 92(6), 2022, pp. 1929–1952. <https://link.springer.com/article/10.1007/s00419-022-02157-7>

(with E. Gurvich) Weak Solutions for a Poro-elastic Plate System, *Applicable Analysis*, Vol. 101 (5), 2022, pp. 1617–1636. <https://www.tandfonline.com/doi/full/10.1080/00036811.2021.1953483>

(with L. Bociu, S. Čanić, and B. Muha) Multilayered Poroelasticity Interacting with Stokes Flow, *SIAM J. Mathematical Analysis*, Vol. 53 (6), 2021, pp.6243–6279. <https://epubs.siam.org/doi/abs/10.1137/20M1382520>

(with L. Bociu) Nonlinear Quasi-static Poroelasticity, *J. Differential Equations*, Volume 296 (25), 2021, pp. 242–278. <https://www.sciencedirect.com/science/article/abs/pii/S0022039621003703>

(with D. Bonheure, F. Gazzola, and I. Lasiecka) Long-time dynamics of a hinged-free plate driven by a non-conservative force, *Annales de l'Institut Henri Poincaré, Analyse Non Linéaire*, Vol. 39 (2), 2022, pp. 457–500. <https://ems.press/journals/aihpc/articles/4758345>

(with M. Deliyianni) Theory of solutions for an inextensible cantilever, *Applied Mathematics and Optimization*, Volume 84, 2021, pp. 1345–1399. <https://link.springer.com/article/10.1007/s00245-021-09798-0>

(with A. Balakrishna) Large Deflections of A Structurally Damped Panel in A Subsonic Flow, *Nonlinear Dynamics*, Volume 103, 2021, pp. 3165–3186. <https://link.springer.com/article/10.1007/s11071-020-05805-1>

(with M. Deliyianni, V. Gudibanda, and J. Howell) Large Deflections of Inextensible Cantilevers: Modeling, Theory, and Simulation, *Mathematical Modelling of Natural Phenomena*, 15 (44), 2020. <https://www.mnnp-journal.org/articles/mnnp/abs/2020/01/mnnp190148/mnnp190148.html>

Attractors and Determining Modes for a Panel Flutter Model: Finite Dimensionality Out of Thin Air, *Pure and Applied Functional Analysis*, Volume 5, 1, 2020, pp. 85–119. <http://www.ybook.co.jp/online2/oppafa/vol5/p85.html>

(with K. Huneycutt, J. Howell, and S. Wilder) A Thorough Look at the (In)stability of Piston-Theoretic Beams, *Mathematics in Engineering*, Volume 1, 3, 2019, pp. 614–647. <https://www.aimspress.com/article/10.3934/mine.2019.3.614>

(with G. Avalos and P.G. Geredeli) A Linearized Viscous, Compressible Flow-Plate Interaction with Non-dissipative Coupling, *J. Mathem. Anal. Appl.*, Volume 477, 1, 2019, pp. 334–356. <https://www.sciencedirect.com/science/article/pii/S0022247X19303476?via%3Dihub>

(with J. Howell and D. Toundykov) A Cantilevered Extensible Beam in Axial Flow: Semigroup Solutions and Post-flutter Regimes, *SIAM J. Math. Anal.*, Volume 50, 2, 2018, pp. 2048–2085. <https://epubs.siam.org/doi/abs/10.1137/17M1140261>

(with G. Avalos and P.G. Geredeli) Semigroup Well-posedness of A Linearized, Compressible Fluid with An Elastic Boundary, *Discrete Contin. Dyn. Syst. Ser. B*, Volume 23, 3, 2018, pp. 1267–1295. <http://aims sciences.org/article/doi/10.3934/dcdsb.2018151>

(with J. Howell and I. Lasiecka) Quasi-stability and Exponential Attractors for A Non-Gradient System—Applications to Piston-Theoretic Plates with Internal Damping, *Evol. Equs. Control Theory*, Volume 5, 4, 2016, pp. 567–603. <https://aims sciences.org/journals/displayArticlesnew.jsp?paperID=13192>

(with G. Avalos and P.G. Geredeli) Finite Dimensional, Smooth Attractors for A Non-rotational Berger Plate with Dissipation Acting on...the Boundary, *Comm. Pure Appl. Anal.*, Volume 15, 6, 2016, pp. 2301–2328. <http://aims sciences.org/journals/displayArticlesnew.jsp?paperID=13047>

(with E. Dowell, I. Chueshov, and I. Lasiecka) Mathematical Aeroelasticity: A Survey, *Mathem. Engin. Sci. Aerosp.*, Volume 7, 2016, pp. 1–26. <http://nonlinearstudies.com/index.php/mesa/article/view/1283>

(with E. Dowell, I. Chueshov, and I. Lasiecka) Nonlinear elastic plate in a flow of gas: Recent results and conjectures, *Appl. Math. Optim.*, Volume 73, 2016, pp. 475–500. <http://link.springer.com/article/10.1007/s00245-016-9349-1>

(with L. Bociu, G. Guidoboni, R. Sacco) Analysis of nonlinear poro-elastic and poro-visco-elastic models, *Arch. Rational Mech. Anal.*, Volume 222, 3, 2016 pp. 1445–1519. http://link.springer.com/article/10.1007/s00205-016-1024-9?wt_mc=Internal.Event.1.SEM.ArticleAuthorOnlineFirst

(with P.G. Geredeli) Qualitative Results on the Dynamics of A Berger Plate with Nonlinear Boundary Damping, *Nonlin. Anal. B*, 31, 2016, pp. 227–256; published online, February 2016: DOI:10.1016/j.nonrwa.2016.02.002. <http://www.sciencedirect.com/science/article/pii/S1468121816000195>

(with I. Lasiecka) Feedback stabilization of a fluttering panel in an inviscid subsonic potential flow, *SIAM J. Math. Anal.*, 48, 3, 2016, pp. 1848–1891. <http://epubs.siam.org/doi/abs/10.1137/15M1040529>

(with M. Peszynska and R.E. Showalter) Advection of methane in the hydrate zone: Model, analysis, and examples, *Math. Meth. Appl. Sci.*, Volume 38, 18, 2015, pp. 4613–4629. <http://onlinelibrary.wiley.com/doi/10.1002/mma.3401>

(with I. Lasiecka) Eliminating flutter in clamped von Karman plates immersed in subsonic flows, *Comm. Pure Appl. Anal.*, Volume 13, 5, 2014, pp. 1935–1969. <https://www.aims sciences.org/journals/displayArticlesnew.jsp?paperID=9987>

(with I. Lasiecka) Kutta-Joukowski flow conditions in flow-plate interactions: subsonic case, *Nonlinear Anal. B*, Volume 7, 2014, pp. 171–191. <http://www.sciencedirect.com/science/article/pii/S1468121813001235>

(with I. Chueshov and I. Lasiecka) Flow-plate interactions: Well-posedness and long-time behavior, *Discrete Contin. Dyn. Syst. Ser. S, Special Volume: New Developments in Mathematical Theory of Fluid Mechanics*, Volume 7, 5, 2014, pp. 925–965. <http://aims sciences.org/journals/displayArticlesnew.jsp?paperID=9873>

(with P.G. Geredeli) Decay rates to equilibrium for nonlinear plate equations with geometrically constrained, degenerate dissipation, *Appl. Math. Optim.*, Volume 68, 2013, pp. 361–390. <http://link.springer.com/article/10.1007/s00245-013-9210-8>

(with I. Chueshov and I. Lasiecka) Attractors for delayed, non-rotational von Karman plates with applications to flow-structure interactions without any damping, *Comm. PDE*, Volume 39, 11, 2014.
http://www.tandfonline.com/eprint/ARUs3wgC9ih2hzZBGjs3/full#.U_5H3rywLV5

(with I. Chueshov and I. Lasiecka) Evolution semigroups in supersonic flow-plate interactions, *J. Diff. Eqns.*, Volume 254, Issue 4, 2013, pp. 1741–1773, ISSN 0022-0396, 10.1016/j.jde.2012.11.009.
<http://www.sciencedirect.com/science/article/pii/S0022039612004342>

(with P.G. Geredeli and I. Lasiecka) Smooth attractors of finite dimension for von Karman evolutions with nonlinear frictional damping localized in a boundary layer, *J. Diff. Eqns.*, Volume 254, Issue 3, 2013, pp. 1193–1229, ISSN 0022-0396, 10.1016/j.jde.2012.10.016.
<http://www.sciencedirect.com/science/article/pii/S0022039612004093>

(with I. Lasiecka) Generation of bounded semigroups in nonlinear subsonic flow-structure interactions with boundary dissipation, *Math. Meth. Appl. Sci.*, Volume 36, 2013, pp. 1995–2010.
<http://onlinelibrary.wiley.com/doi/10.1002/mma.1518/full>

Weak and strong solutions of a nonlinear subsonic flow-structure interaction: Semigroup approach, *Nonlinear Anal. A*, Volume 74, Issue 10, July 2011, pp. 3123–3136, ISSN 0362-546X, 10.1016/j.na.2011.01.028.
<http://www.sciencedirect.com/science/article/pii/S0362546X11000459>

(with D. P. Sheehan and L.M. Baird) Orthogonally-oriented nanotube arrays: Experiment I, *J. Nanosci. Nanotech.*, Volume 7, Issue 10, 2007, pp. 3653–3661. <http://www.ingentaconnect.com/content/asp/jnn/2007/00000007/00000010/art00048>

PROCEEDINGS, GENERAL AUDIENCE PIECES, POSTERS

(with G. Richard) Fluid and Multilayer Poroelastic Structure Interaction Well-Posedness, Poster, Workshop for Research and Workforce Development in Fluid Mechanics, University of Nebraska-Lincoln, May 2025. (Presenter: G. Richard)

(with E. Sheldon) Periodic Solutions and Resonance in Wave-Heat Systems, Poster, URCAD, UMBC, April 2025. (Presenter: E. Sheldon)

(with Kathleen Hoffman, Kal Nanes, Justin Webster, Jennifer Harrison, Kerrie Kephart, Tory Williams) Assessing the Impacts of An Interventional Proof-Writing Course, Poster for UMBC Provost’s Teaching and Learning Symposium, October 2024

(with Kathleen Hoffman, Kal Nanes, Justin Webster, Jennifer Harrison, Kerrie Kephart, Tory Williams) Impact of an Interventional Proof-writing Course, Poster for UMBC Provost’s Teaching and Learning Symposium, April 2023

Virtual Poster (Student Presenter: K. Lilly), JMM, January 2021 and February 2021 (won best poster)

(with J. Howell and V. Gudibanda) Dynamics of the Inextensible Inverted Flag with Piston-Theoretic Forcing Term, Poster, JMM, Baltimore, MD, January 2019. (Presenter: V. Gudibanda; won best poster)

The invisible power of ‘flutter’ — from plane crashes to snoring to free energy, *The Conversation*, March 2018.
<https://theconversation.com/the-invisible-power-of-flutter-from-plane-crashes-to-snoring-to-free-energy-91796>
Featured in: *Scientific American*, *Los Angeles Times*, *Chicago Tribune*, *San Francisco Chronicle*, 7500 reads

(with I. Lasiecka and I. Chueshov) Nonlinear Flow-Structure Interactions, *Nonlinear World—Journal of Interdisciplinary Nature*, 1(1), December 2017, pp. 31–50.

(with D. Prada, R. Sacco, B. Cockburn, L. Bociu, B. Siesky, A. Harris, and G. Guidoboni) Influence of tissue viscoelasticity on the optic nerve head perfusion: a mathematical model, Poster #3558, Annual Meeting of the Association for Research in Vision and Ophthalmology, May 2016. (Presenter: D. Prada)

(with I. Lasiecka) Stabilization of a nonlinear flow-plate interaction via component-wise decomposition, XV International Conference on Hyperbolic Problems: Theory, Numerics, Applications, July 2014, IMPA, Rio de Janeiro, Brazil, *Bull. Braz. Math. Soc.*, New Series 47(2), 2016, pp. 489–506. (*peer-reviewed*)

(with I. Lasiecka) Controlling Flutter for Nonlinear Panels in Subsonic Flows via Nonlinear Mechanical Feedback, IEEE 53rd Conference on Decision and Control, Session on Control of First and Second Order PDEs, 2014,
DOI: 10.1109/CDC.2014.7039443, pp. 577–582. (*peer-reviewed*)

(with I. Lasiecka) Long-time dynamics and control of subsonic flow-structure interactions, American Control Conference (ACC), 2012, pp. 658–663, 27–29 June 2012. (*peer-reviewed*) <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6315219>

POST-DOCTORAL RESEARCHERS

Arum Lee
Professional Development and Teaching Mentor

2025–present

Rasika Mahawategge
Professional Development and Teaching Mentor

2022–2025

STUDENTS

Ph.D. (UMBC)

Madison Christ, Ph.D., Applied Mathematics 2024–Present
Reading

Galen Richard, Ph.D., Applied Mathematics 2022–Present
ABD

Ellie Gurvich, Ph.D., Applied Mathematics 2019–2024
Dissertation: “Semigroup Methods for Poroelastic Multi-physics Systems Describing Biological Tissues”

Abhishek Balakrishna, Ph.D., Applied Mathematics (joint with A. Biswas) 2018–2023
Dissertation: “Infinite Dimensional Dynamical Systems In Fluid Dynamics And Fluid-Structure Interaction”
UMBC Mathematics Graduate: Research Award (2022,2023); Teaching Award (2022)
Now: Postdoctoral Researcher at the University of Southern California

Maria Deliyianni, Ph.D., Applied Mathematics 2017–2022
Dissertation: “Modeling and PDE Theory for The Large Deflections of Elastic Cantilevers”
UMBC Mathematics Graduate: Research Award (2021); Teaching Award (2021)
Now: Postdoctoral Researcher at the University of Arizona Partially supported by NSF DMS–1907620

M.S.

Peter Lavagnino, Applied Mathematics 2021–2023
M.S. in Spring 2023 (project option)
Project: “Semigroup Weak Solutions for Mildly Degenerate Linear Poro-elasticity”

Katelynn Huneycutt, Ph.D., Applied Mathematics 2019–2020
Qualified for Ph.D., M.S. in Spring 2020 (transferred)

Austin Mishoe, M.S. (CofC) 2016–2017
Co-advised with J. Howell, Project: Beam flutter in axial flows
Partially supported by NSF DMS–1635281

Undergraduate Research Advisor (Since 2020)

Katherine Carver (UMBC) 2025–present
Supported by: Meyerhoff Scholars

Evan Sheldon (UMBC) 2023–2025
Undergraduate Thesis: *Periodic Solutions and Resonance in Wave-Heat Systems*
Supported by: Vivian Thomas Scholars Initiative Sustained Research Stipend, UMBC URA
Now: Ph.D. program in Physics at the University of Wisconsin-Madison

Isaac Benson (UMBC) 2023–2024

Rachel Dolle (Carnegie Mellon University) Summer 2021, 2022
Co-advised with J. Howell, Project: Modal analysis of bridge flutter
Supported by: NSF DMS—1907620 (UMBC), DMS–1908033 (CMU)
Now: Research scientist at Edwards Air Force Base

Kaitlynn Lilly (UMBC) 2018–2022
Co-advised with J. Howell, Project: Spectral properties of non-self adjoint beam models
Supported by: Meyerhoff Scholars, NSF DMS—1907620 (UMBC), DMS—1908033 (CMU)
NSF GRFP, DOD SMART, DOE, Ford Fellowships Winner, 2022
Goldwater Scholar, 2021
Now: Ph.D. program in Applied Mathematics at the University of Washington

Benjamin Brown (UMBC) 2021–2022
Co-advised with J. Howell, Project: Simulating piezoelectric cantilevers
Supported by: NSF DMS—1907620 (UMBC), DMS–1908033 (CMU)
Now: Ph.D. program in Physics at Brown University

Anna Moskaleva (Carnegie Mellon University) Summer 2021
Co-advised with J. Howell, Project: Finite Difference models for elastic plates
Supported by: NSF DMS—1907620 (UMBC), DMS–1908033 (CMU)

Anrey Peng (Carnegie Mellon University)
 Co-advised with J. Howell, Project: Cantilever limit cycles
 Supported by: NSF DMS—1907620 (UMBC), DMS—1908033 (CMU)

Summer 2020

Undergraduate Mentor, UMBC Students

Ephraim Ruttenberg
 Post-graduation Applications; Teaching
 Now: Ph.D. program in Mathematics at the University of Pittsburgh

2023–2024

Meghan Kwon
 GRFP and Graduate Applications

2022–2024

Kristen Galuska
 Post-graduation Applications; Teaching

2022

Applied Math Bootcamp Students (UMBC)
 Isaac Benson, Evan Sheldon, Ben Kirn

Summer 2023

Zinedine Partipilo Cornielles (2022 CAHSS Valedictorian)
 Graduate Applications
 Now: Pre-doctoral Program at Harvard Univ.

2021–2022

Ph.D. Committee Member (non-advisor)

Naghmeh Akhavan
 Carlos Barajas
 Guy Djokam

4/22/2025

4/1/2022

11/5/2021

SELECTED INVITED/SUPPORTED RESEARCH VISITS (SINCE 2020)

University of Pittsburgh (three days)
 Paolo Galdi

April 2025

Politecnico di Milano, Italy (sabbatical visit)
 Vittorino Pata, Filippo Gazzola, Alessio Falocchi, Riccardo Sacco, Paolo Zunino

March–April 2024

Politecnico di Milano, Italy (one week)
 Vittorino Pata and Filippo Gazzola

March 2023

University of Bergen, Norway (two days)
 Research Group of Jakub Both

July 2022

University of Zagreb, Croatia (one week)
 Department of Mathematical Sciences, Boris Muha

July 2018, 2019, March 2022

Czech Academy of Sciences (one week)
 Institute of Mathematics, Sarka Necasova (Eminent Scholar Mentor)

July 2019, March 2022

Iowa State University (one week)
 Scott Hansen and Pelin Geredeli (and G. Avalos, University of Nebraska-Lincoln)

September 2021

Penn State University (one week, with student M. Deliyianni)
 Anna Mazzucato

September 2021

NYU Abu Dhabi, UAE (one week)
 Anna Mazzucato (on leave from Penn State University)

February 2020

PRESENTATIONS (SINCE 2020)

Invited Talk, AMS SE Sectional, Savannah, 2026
 In-session Talk, AMS SE Sectional, Savannah, 2026
 Invited Talk, Joint Mathematics Meeting, Washington DC, 2026
 Invited Talk, SIAM Analysis of PDEs, Pittsburgh, 2025
 In-session Talk, SIAM Analysis of PDEs, Pittsburgh, 2025
 In-session Talk, SIAM Central Sectional, Fayetteville, Arkansas, 2025

Invited Talk, Loyola University Chicago Mathematics Colloquium, September 2025

Invited Talk, Brijuni Applied Mathematics Workshop (Croatia), June 2025

Invited Talk Mathematics with Applications 2025 (Madeira, Portugal), June 2025

Invited Tutorial Lecture, Workshop for Research and Workforce Development in Fluid Mechanics, University of Nebraska-Lincoln, May 2025

Invited Talk, AMS Western Sectional Meeting, San Luis Obispo, CA, May 2025

Invited Talk, Special Seminar, University of San Diego, April 2025

CNMS Scientific Discovery Series Speaker, April 15, 2025

Invited Talk, Mathematics Seminar, Georgetown University, March 2025

Local Talk, UMBC Applied Differential Equations Seminar, March 2025

Invited Talk, Mathematics Colloquium, Morgan State University, September 2024

Local Talk, UMBC Applied Mathematics Colloquium, September 2024

Invited Talk, Carnegie Mellon University, Center for Nonlinear Analysis Seminar, September 2024

Invited Talk, Notre Dame University, Applied Mathematics Seminar, September 2024

Invited Talk, Equadiff 2024, Karlstadt, Sweden, June 2024

Invited Talk, First Year Graduate Seminar, Oregon State University, May 2024

Contributed Talks, Ingenuity STEM Leadership Conference, Morgan State University, May 2024

Invited Talk, Seminar Bogoljub Stanković, Novisad University, Serbia, April 2024

Invited Talk, Baylor University, Applied Mathematics Colloquium, February 2024

Invited Talk, University of Maryland, College Park, PDE Seminar, November 2023

Grit-X 2023 Invited Speaker, UMBC Homecoming Weekend, October 14, 2023

Invited Talk, Panelist (virtual), University of Arizona Graduate Student Seminar, September 26, 2023

Invited Talk, 10th International Congress on Industrial and Applied Mathematics, Tokyo, Japan, August 2023
Special Session: Numerical methods for fluid-structure interaction and poroelasticity

Invited Talk, Drexel University PDE/Applied Mathematics Seminar, April 2023

Invited Talk, Reflections on Mathematical Fluid Dynamics, University of Virginia, March 2023

Invited Talk, ApplMath22, Briun, Croatia, September 2022

Invited Talk, EQUADIFF 15, Brno, Czech Republic, July 2022

Invited Talk, University of Bergen, Special Seminar, July 2022

Invited Talk, First Year Graduate Seminar, Oregon State University, May 2022

Invited Presentation, UMBC President's Research Council (invitation: VPR Karl Steiner), March 2022

Invited Talk, Georgetown University Mathematics and Statistics Colloquium, March 2022

Invited Talk, Faculty of Mathematics, University of Zagreb, Croatia, March 2022

Invited Talk (virtual), University of Nebraska-Lincoln PDE Seminar, March 2022

Invited Talk (virtual), State University of Londrina (Brazil) Summer Lecture Series, March 2022

Local Talk, UMBC Differential Equations Seminar, November 2021

Local Talk (virtual), UMBC Applied Mathematics Colloquium, October 2021

Invited Talk (virtual), IFIP TC 7 Conference on System Modelling and Optimization, August 2021
Special Session: Qualitative and quantitative analysis of nonlinear evolutionary partial differential equation

Invited Talk (virtual), 8th European Conference of Mathematics, Special Session on Analysis, Control and Inverse problems for Partial Differential Equations, June 2021, Portoroz, Slovenia

Invited Talk (virtual), Western Kentucky University, SIAM Undergraduate Student Chapter, April, 2021

Invited Talk (virtual), University of California, Riverside PDE and Applied Mathematics Seminar, January 2021

Invited Talk (virtual), Baylor University, Mathematics Colloquium, October 2020

Invited Talk (virtual), Universitat Würzburg, Institut für Mathematik,
Oberseminar Mathematik in den Naturwissenschaften, July 2020

Invited Talk, Duke University Mechanical Engineering, Aeroelasticity Group, March 2020

Invited Talk, The Third International MathStat Conference, American University of Sharjah, UAE, February 2020

Invited Talk, NYU (Abu Dhabi) Mathematics Seminar, February 2020

STUDENT PRESENTATIONS (SINCE 2020)

Local Talk (Students: E. Sheldon), UMBC Differential Equations Seminar, May 2025

Local Talk (Student: G. Richard), UMBC Differential Equations Seminar, March 2025

Contributed Talk (Student: E. Gurvich), GeMTRAK, UPenn, April 2024

Local Talk (Students: E. Sheldon and I. Benson), UMBC Differential Equations Seminar, May 2024

Local Talk (Student: E. Gurvich), UMBC Differential Equations Seminar, March 2024

Local Talk (Student: E. Gurvich), UMBC Differential Equations Seminar, December 2023

Local Talk (Student: A. Balakrishna), UMBC Differential Equations Seminar, May 2023

Local Talk (Student: P. Lavagnino), UMBC Differential Equations Seminar, May 2023

Invited Talk (Student: A. Balakrishna), University of Virginia PDE Seminar, November 2022

Invited Talk (virtual) (Student: A. Balakrishna), University of California-Berkeley, Applied PDE Seminar, November 2022

Invited Talk (Student: E. Gurvich), AMS Sectional Meeting, Chattanooga, TN, October 2022

Invited Talk (Student: A. Balakrishna), AMS Sectional Meeting, Salt Lake City, UT, October 2022

Invited Talk (Student: A. Balakrishna), SAYAS Conference, UMBC, Baltimore, September 2022

Invited Talk (virtual) (Student: E. Gurvich), University of Nebraska-Lincoln PDE Seminar, May 2022

Invited Talk (Student: A. Balakrishna), U.S. Naval Academy Applied Mathematics Seminar, April 2022

Contributed Talk, (Student: E. Gurvich), Shanks PDE, Vanderbilt University, February 2022

Invited Talk (Student: M. Deliyianni), Northwestern University Applied Mathematics Seminar, February 2022

Local Talk (Student: E. Gurvich), UMBC Differential Equations Seminar, November 2021

Invited Talk (Student: A. Balakrishna), University of Memphis, PDE Seminar, July, 2021

Local Talk (virtual) (Student: K. Lilly), UMBC Differential Equations Seminar, October 2020

WORKSHOPS PARTICIPANT (SINCE 2020)

Simons Laufer Mathematical Sciences Institute (MSRI) Workshop

December 4–8th, 2023

Hot Topics: Recent Progress in Deterministic and Stochastic Fluid-Structure Interaction

PROFESSIONAL ACTIVITIES

Editor:

Evolution Equations and Control Theory

June 2022–Present

Associate Editor

Nonlinear Dynamics

2019–2024

Subject Editor: Nonlinear PDE

(Guest) *Research in the Mathematical Sciences*, 2024

Special volume on PDE-control, From Classical to Emerging Themes and Methods

<https://link.springer.com/collections/ichhffhgfe>

(Guest) *Evolution Equations and Control Theory*, Volume 5, 4, 2016

Special volume on fluid-structure interactions, SIAM Conference on Analysis of PDEs 2015

<http://www.aims sciences.org/journal/A0000-0000/2016/5/4>

Trainings and Certificates:

Active Learning, Inquiry Teaching (ALIT) Certificate Program (completed: May 2020) *2018–2020*
 UMBC Faculty Development Center

Green Zone Training (Supporting UMBC's Military Students) *October 9, 2018*
 Contact: Dr. Rick Forno, UMBC

Entrepreneurial Skillset Training Program (one week) *January 2018*
 Center for Leadership and Innovation, UMBC Training Centers

Professional Societies:

IFIP TC7, Working Group 7.2 *2021–present*

European Mathematical Society *2020–present*

Society for Industrial and Applied Mathematics (SIAM) *2013–present*

American Mathematical Society (AMS) *2013–present*

General Professional Development (Since 2020):

Teaching STEM, UMBC Faculty Development Center Workshop *January 24, 2020*

Committee:

Brijuni Applied Mathematics Workshop (Croatia)

Summer 2025, International Scientific Committee

Mathematics with Applications 2025 (Madeira, Portugal)

Summer 2025, Organizing Committee

Brijuni Applied Mathematics Workshop (Croatia)

Summer 2021, International Scientific Committee

AMS Southeast Sectional Meeting Local Organizing Committee

Spring 2017, College of Charleston, Charleston, SC.

Organizer (Since 2020):

Special Session: Applicable Analysis of Multi-physics Partial Differential Equations Systems
 with G. Avalos (University of Nebraska-Lincoln), AMS 2026 SE Sectional Meeting, Savannah, Georgia, March, 2026

Minisymposium: Stability and Periodicity in PDE Systems
 with D. Ambrose, SIAM PDE, Pittsburgh, November 2025

Minisymposium: Control and Stability of Fluids and Structures
 with I. Kukavica, SIAM Central States Sectional, University of Arkansas, October 2025

Minisymposium on Fluids and Structures in Application at UMBC, April 2025
 Supported by: NSF Grant, Department of Mathematics of Statistics, ORCA, CNMS

Special Session: Applicable Analysis of Multi-physics Partial Differential Equations Systems
 with G. Avalos (University of Nebraska-Lincoln), AMS 2024 SE Sectional Meeting, Savannah, Georgia, October 5–6, 2024

Special Session: PDE Theory for Fluid-Structure Interactions
 with A. Falocchi (Politecnico di Milano, Italy), AMS-UMI 2nd Joint Meeting, Palermo, Italy, July 23–26, 2024

Special Session: Analysis of PDE in Inverse Problems and Control Theory
 with M. Eller (Georgetown Univ.), AMS 2023 Eastern Sectional, Howard University, Washington DC, April 6–7, 2024

Simons Laufer Mathematical Sciences Institute (MSRI) Workshop: Hot Topics: Recent Progress in Deterministic and Stochastic Fluid-Structure Interaction
 with S. Canic, J. Kuan, and M. Bukac, December 4–8th, 2023

Applied Mathematics Bootcamp (at Carnegie Mellon University)
 with J. Howell (CMU); 6/12–17/2023
 NSF-supported intensive training for UMBC undergraduates: Isaac Benson, Evan Sheldon, Ben Kirn

Special Session: Bifurcations, periodicity and stability in fluid-structure interactions
 with B. Muha and S. Schwarzacher, ICIAM 2023, Tokyo (Japan), August 20–25, 2023

Special Session: Fluid-Structure Interactions in Application
 with B. Muha, S. Necasova, and A. Schlomerkemper, SIAM PDE, Berlin (Germany), March 22–29, 2022, Virtual

Special Session: Fluid-Poro-Elastic Structure Interactions

with L. Bociu, IFIP TC 7 Conference on System Modelling and Optimization, August 30–September 3, 2021, Virtual

Special Session: Mathematical Analysis: The interaction of Fluids/viscoelastic Materials and Solids

with B. Muha, 8th European Congress of Mathematics, 2021, Portoroz, Slovenia

Referee/Reviewer:

J. Functional Analysis, J. of Abstract Differential Equations and Applications, Applicable Analysis, Applied Mathematics and Computation, Applied Mathematical Modelling, Computational Optimization and Applications, Discrete and Continuous Dynamical Systems, J. Optimization Theory and Application, Mathematics in Engineering, Evolution Equations and Control Theory, Asymptotic Analysis, Indiana Univ. Mathematics J., J. of Mathematical Analysis and Applications, J. of Mathematical Physics, SIAM J. on Numerical Analysis, Mathematische Nachrichten, Nonlinear Analysis A: Theory, Method, and Application, Nonlinear Analysis B: Real World Applications, Zeitschrift für Angewandte Mathematik und Physik, Zeitschrift für Angewandte Mathematik und Mechanik, J. of Fluids and Structures, Automatica, J. of Aerospace Engineering, Applied Mathematics and Optimization, Nonlinear Dynamics, International J. of Dynamical Systems and Differential Equations, Mathematical Methods in the Applied Sciences, AMS Mathematical Reviews, SIAM J. of Mathematical Analysis, Nonlinearity, J. Optimization Theory, SIAM J. of Applied Mathematics, J. Mathematical Fluid Mechanics, J. of European Mathematics, Numerische Mathematik, Nonlinear Differential Equations and Applications, Mathematical Models and Methods in Applied Sciences, Advances in Mathematical Fluid Mechanics (series)

Institute of Physics (IOP), Awarded: *Distinguished Reviewer 2023, 2024; Trusted Reviewer Status May 2022*

External Examiner:

Ph.D. thesis committee in Mathematics for: Lorenzo Liverani *February 2023*

Politecnico di Milano, Italy

Ph.D. thesis committee in Mathematics for: Clara Patriarca *February 2023*

Politecnico di Milano, Italy

Ph.D. thesis committee in Mechanical Engineering for: Kevin McHugh *March 2020*

Duke University

MSc/MA thesis in Applied Mathematics for: Nicholas I-Hsien Kuo *May 2017*

University of Auckland, New Zealand

External Panelist/Ad Hoc Reviewer:

National Science Foundation DMS *2020, 2023*

TEACHING EXPERIENCE

University Maryland, Baltimore County

Semigroup Seminar (~6 students), 1 semester *2025*

Introduction to Linear Algebra (200 level), 1 semester *2024*

Partial Differential Equations (600 level), 6 semesters *2018–2024*

Introduction to Partial Differential Equations (400 level), 10 semesters *2017–2025*

Introduction to Proofs (300 level), 2 semesters *2022–2023*

Introduction to Complex Analysis (400 level), 1 semester *2021–2022*

Introduction to Analysis (300 level), 1 semester *2020–2021*

Introduction to Differential Equations (200 level), 3 semesters *2020–2024*

Special Topics in Applied Math: Semigroups and Unbounded Operators (700 level), 3 semesters *2019–2023*

Special Topics in Applied Math: Modern Methods in PDEs (700 level), 1 semester *2018–2019*

Ordinary Differential Equations (600 level), 1 semester *2017–2018*

Politecnico di Milano

Fluid and Flow Structure Interactions, 25 hours *March 2024*

SERVICE

Profession

Goldwater Scholars Community Mentorship Program (Undergraduate Mentor) *2022–present*

2025–2027 Lila Fowler, University of San Diego

2024–2026 Alexis Lopez, Rice University

2024–2025 Alina Chandra, University of Washington

2023–2024 Katie Traynelis, North Carolina State University
 NSF Graduate Fellowship recipient in 2024
 Now: Ph.D. program in Biological Engineering at Massachusetts Institute of Technology

2022–2023: Ethan Brady, Purdue University
 NSF Graduate Fellowship recipient in 2023
 Now: Ph.D. program in Applied Mathematics at Brown University

University of Maryland, Baltimore County

UMBC Course Outcomes Data Committee (CODC)	2026–2028
UMBC Strategic Planning Subgroup (Research and Creative Achievement)	2026
Academic Success Center Advisory Board	2025–present
Provost’s Committee on Graduate Enrollment Strategy	2024–2025
Faculty Participant for the 2024 Ingenuity Conference on STEM Leadership	May 24th, 2024
Faculty Volunteer for the Science Olympiad (for CNMS; Math & Stat)	January 13th, 2024
Faculty ADVANCEment Workshop Panelist (for CNMS)	May 8th, 2023
Council of University System Faculty (CUSF) Member (UMBC Representative)	2021–2024
ΦBK Board (Vice President 2020–2023, President 2023–present)	2018–present
Local representative and Board Member of the ΦBK Greater Baltimore Alumni Association	2017–present
Faculty ADVANCEment Workshop Panelist (for CNMS)	April 19th, 2022

Letters of Recommendation Composed
 For UMBC Students: Undergraduate: 66 Graduate/Postdoc: 25
 External: Students: 7 Faculty: 4

University of Maryland, Baltimore County Mathematics and Statistics Department

Undergraduate Program Director	Fall 2025–present
Committee on Enrollment Growth and Outreach	Fall 2023–present
Co-organizer of the Applied Mathematics Colloquium	2022–present
Faculty Mentor for Tongtong Li	2024–present
Faculty Mentor for Matthew Kvalheim	2023–present
IIME (Pi Mu Epsilon) Advisor/Committee Chair	2017–2024
Mathematics and Statistics Cyber Open Rank Hiring Committee; Chair	2024–2025
Mathematics and Statistics Postdoctoral Hiring Committee	2024–2025
Mathematics and Statistics Lecturer Hiring Committee	2023–2024
Committee on DEIA Departmental Documentation	Spring 2023
Applied Mathematics Tenure Track Hiring Committee; co-Chair	2022–2023
Postdoctoral Scholar in Applied Mathematics Hiring Committee	Spring 2022
Organizer of the Differential Equations Seminar	2018–2022
Undergraduate Program Committee	2020–present
IIME Faculty Research Panel	March 30, 2022
Mentor for NSF Graduate Proposal (K. Lilly)	Fall 2021
Departmental Recruitment Open House (COVID)	Spring 2020, 2021, 2022
SIAM Graduate Student Association Event Speaker (“How to Give A Talk”)	Spring 2020
Departmental Representative at Spring Scholar Luncheon	Spring 2020
Mentor for NSF Graduate Proposal (K. Huneycutt)	Fall 2019
Mentor for NSF Graduate Proposal (E. Gurvich)	Fall 2019
Host/planner Special Joint Seminar (with Mechanical Engineering) hosting Earl Dowell (Duke)	Fall 2019
Qualitative Measures in P&T Committee Member	Spring 2018
BOOST Post-Baccalaureate Program Committee; senior proposal personnel	2017–2018
Departmental CNMS Awards Committee	2018–2019

University of Maryland, Baltimore County Recruitment/Outreach Events

UMBC Meyerhoff Scholars Program: <i>Summer Bridge Program</i> ;	July, 2021–2025
UMBC Majors Fair	November 2023
UMBC Majors Fair	November 2022
UMBC: <i>Reception for Academically Talented Latinx Prospective Students</i>	April 25, 2019
UMBC: <i>Retriever Days, Mathematics and Statistics Representative</i>	November 5, 2018
UMBC: <i>Reception for Academically Talented African American Prospective Students</i>	April 30, 2018
Virginia State University Mathematics Seminar	March 2018

