

# CURRICULUM VITA

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## EDUCATION

- **Ph.D.** Mechanical Engineering, University of Pittsburgh April 2004
- **M.S.** Mathematics, University of Pittsburgh August 1999
- **M.S.** Physics, University of Pittsburgh April 1998
- **B.Phil.** Physics & Astronomy, Mathematics April 1995  
University Honors College,  
University of Pittsburgh

## PROFESSIONAL EXPERIENCE

### FACULTY APPOINTMENT

- 09/2021 – present Professor, Department of Mathematics, Montclair State University
- 07/2019 – 06/2025 Chairperson, Department of Mathematics (changed from Mathematical Sciences in January 2020), Montclair State University.
- 07/2018 – present Associate Professor (Joint Appointment), Department of Physics and Astronomy, Montclair State University.
- 07/2016 – 06/2017 Auxiliary Chair, Department of Mathematical Sciences, Montclair State University.
- 09/2014 – present Associate Professor, Department of Mathematical Sciences, Montclair State University.
- 09/2014 – 06/2018 Director, Science Honors Innovation Program(SHIP)  
College of Mathematics and Science, Montclair State University
- 08/2009 – 08/2014 Assistant Professor, Department of Mathematical Sciences, Montclair State University.

### POSTDOCTORAL APPOINTMENTS

- 08/2006 – 07/2009 RTG Postdoctoral Research Associate/Lecturer, Department of Mathematics, University of North Carolina, Chapel Hill.
- 08/2005 – 05/2006 Postdoctoral Scholar/Instructor, Department of Mathematics, Florida State University.
- 09/2005 – 05/2006 Research Associate, Geophysical Fluid Dynamics Institute, Florida State University.

- 08/2004 – 05/2005 Postdoctoral Associate, Department of Mathematical Sciences, Carnegie Mellon University.

#### ADJUNCT AND OTHER TEACHING APPOINTMENTS

- 08/1999 – 12/2003 Adjunct Faculty, Department of Mathematics and Science Robert-Morris University.
- 08/1998 – 05/1999 Adjunct Faculty, Department of Physical Sciences, Community College of Allegheny County.
- 08/1999 – 04/2004 Graduate Student Researcher / Teaching Fellow, Department of Mechanical Engineering, University of Pittsburgh.
- 08/1995 – 08/1999 Teaching Assistant, Department of Mathematics, University of Pittsburgh.
- 08/1992 – 08/1995 Undergraduate Researcher, Department of Physics and Astronomy, University of Pittsburgh.

#### VISITING APPOINTMENTS

- 06/2001 – 07/2001 Visiting Scholar, Department of Mathematics, Institute Superior Technico, Lisbon, Portugal.
- 06/ 2006 – 07/2006 Visiting Scientist, Division of Engineering Mechanics, Jawaharlal Nehru Center for Advanced Scientific Research Bangalore, India.
- 05/12 – 05/20, 2007 Visiting Professor, Department of Mathematics, Institute Superior Technico, Lisbon, Portugal.
- 06/01- 08/31, 2008, 2009 Visiting Research Consultant, Prithvi Information Solutions, Analytics Division, Hyderabad, India.
- 05/12 - 05/17, 2025 Visiting Professor, CIMA – Center for Investigations in Mathematics and its Applications, Department of Mathematics, University of Evora, Evora, Portugal.

#### OTHER APPOINTMENTS

##### *Journal Editorship*

- Editor-in-Chief, **LASER Journal** (Montclair State University), September 2023-present.
- Associate Editor, **Inquiry: Critical Thinking Across Curriculum**, September 2023-present.
- Editorial Board Member, **Fluids** (MDPI), December 2018 – present.
- Topics Editorial Board, **Entropy** (MDPI), April 2020 – present
- Associate Editor for **Applied Mathematics and Computation** (Elsevier), 2011 –2024.

#### Guest Editorship

- Guest Editor, Special Issue titled *Mechanics of Fluid-Particles Systems and Fluid-Solid Interactions*, **Fluids** (MDPI), 2017.
- Guest Editor, Special Issue: *AI and Education: Dispatches from the Classroom*, Inquiry: Critical Thinking Across Disciplines, 2025.

#### Research Appointments

- Fellow, Center for Ecological Study of Perception and Action, University of Connecticut, Storrs, CT, 2021 – present.
- Research Member, Center for Investigations in Mathematics and its Applications (CIMA), University of Evora, Evora, Portugal, 2025-present.

#### Program Appointments

- Advisory Board Member, Interdisciplinary School for Social Transformation, Montclair State University, Fall 2025-present.
- Director, Science Honors Innovation Program (SHIP) College of Mathematics and Science, Montclair State University, 2014-2018.
- Advisory Board, PSEG Institute for Sustainability Science, College of Science and Mathematics, Montclair State University, 2015-2018.
- Faculty Fellow, Center for Community Engagement, Montclair State University, 2018-2020.

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## RESEARCH INTERESTS

Fluid mechanics, Complex systems, Pattern formation, Partial differential equations, Non-Newtonian fluids, Fluid-Structure interaction, Hydrodynamic stability, Non-equilibrium Thermodynamics, Vortex Induced oscillations, Rheology, Pathological flows, Network Analysis, Philosophy of Science, Sustainability & Science and Creativity in Mathematics and Science.

## PUBLICATIONS

### REFEREED JOURNAL PUBLICATIONS (*Student names are underlined>*)

1. G.P.Galdi and A. Vaidya, Translational fall of symmetric bodies in a Navier-Stokes liquid with applications to particle sedimentation, ***Journal of Mathematical Fluid Mechanics***, 3, 183-211, 2001.
2. G.P.Galdi, A.Vaidya, M. Pokorný, D.D.Joseph and J.Feng, Orientation of symmetric bodies falling in a second-order fluid at low Reynolds numbers, ***Mathematical models and methods in applied sciences***, 12, 1653-1690, 2002.
3. A.Vaidya and G.A.J.Sparling, Classical solutions of the perturbed wave equation with singular kernel, ***Acta Math Univ. Comenianae***, Vol. 72, 2, 65-75, 2003.

4. A.Vaidya, Steady fall of bodies of arbitrary shape in a second-order fluid at zero Reynolds numbers, *Japan Journal of Industrial and Applied Math.*, 21, 3, 299-321, 2004.
5. A. Vaidya, A note on the orientation of symmetric rigid bodies sedimenting in a power-law fluid, *Applied Math. Letters*, 18, 1332-1338, 2005.
6. A. Vaidya, Existence of freefall of rigid bodies in a second-order fluid model with applications to particle sedimentation, *Nonlinear Analysis: Real World Applications*, 7, 4, 748-768, 2006.
7. A. Vaidya, On the transient nature of shape-tilting bodies sedimenting in polymeric liquids, *Journal of Fluids and Structures*, 22, 253-259, 2006.
8. A.Vaidya and R.Wulandana, Nonlinear stability for convection with temperature dependent viscosity, *Mathematical Methods in the Applied Sciences*, 29, 13, 1555-1561, 2006.
9. B.J. Chung, A.Vaidya and R. Wulandana, Stability of channel-flow with linear temperature dependent viscosity, *International Journal of Applied Mathematics and Mechanics*, 2, 1, 24-33, 2006.
10. M. Massoudi, A. Vaidya and R. Wulandana, Natural convection flow of a generalized second grade fluid in a vertical channel, *Nonlinear Analysis: Real World Applications*, 9(1), 80-93, 2008.
11. M. Massoudi and A. Vaidya, On some generalizations of the second grade fluid, *Nonlinear Analysis: Real World Applications*, 9(3), 1169-1183, 2008.
12. B.J.Chung and A. Vaidya, An optimal principle in fluid-structure interaction, *Physica D*, 237(22), 2945-2951, 2008.
13. R. Camassa, R.M. McLaughlin, N.M. Moore and A.Vaidya, Brachistochrones in potential flow and connection to Darwin's theorem, *Physics Letters A*, 372(45), 6742-6749, 2008.
14. B.J. Chung and A.Vaidya, An Axiomatization of Realities, *Mathematical Connections, Series II*, Number 4, pages 1-21, 2008.
15. B.J. Chung and A. Vaidya, On the slow motion of a sphere in fluids with non-constant viscosities, *International Journal of Engineering Science*, Volume 48, 1, 78-100, 2010.
16. B.J.Chung, G. Gipson, A. Shenoy and A. Vaidya, Image analysis of wake structure past cylinders of finite lengths, *International Journal of Imaging*, Volume 4, A10, 18-32, 2010.
17. M. Massoudi and A. Vaidya, A note on unsteady, unidirectional flow of an incompressible, inhomogeneous Navier-Stokes fluid, *International Journal of Nonlinear Mechanics*, Vol. 46,(5), 738-741, 2011.
18. S. Chatla, S. Kadam, D. Kolluru, S. Sinha and A. Vaidya, Complex networks and SOA: A mathematical study of granularity based service selection algorithms, *Sadhana - Academy Proceedings in Engineering Science (Indian Academy of Science)*, Vol. 36, No. 4, 441-462, 2011.

19. Achuthan, S., Chung, B.J., Ghosh, P., Rangachari, V. and Vaidya, A., A Modified Stokes-Einstein's Equation for A-beta Aggregation, **BMC Bioinformatics**, 12 (Suppl 10):S13, 1-13, 2011.
20. B.J. Chung and A. Vaidya, Non-equilibrium pattern selection in particle sedimentation, **Applied Mathematics and Computation**, Vol. 218 (7), 3451-3465, 2011.
21. M. Munakata and A. Vaidya, Encouraging creativity in mathematics and science through photography, **Teaching Mathematics with Applications**, 31(3): 121-13, 2012. (rated top 5 most downloaded article as of 04/2016). Editors choice article since 2012.
22. M. Massoudi and A. Vaidya, Analytical solutions to Stokes-type flows of inhomogeneous fluids, **Applied Mathematics and Computation**, 218, 6314–6329, 2012.
23. M. Cohrs, W. Ernst and A. Vaidya, Potential for energy harvesting from vortex induced oscillations, **International Journal of Ecology and Development**, 26(3), 1-9, 2013.
24. Ghag, G., Ghosh, P., Mauro, A., Rangachari, V. and Vaidya, A., Stability Analysis of four species A-beta Aggregation Model: A Novel Approach to Obtaining Physically Meaningful Rate Constants, **Applied Mathematics and Computation**, 224(1), 205-215, 2013.
25. M. Munakata and A. Vaidya, Undergraduate Research: Fostering creativity through personalized education, **PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies**, 23(9), 64-75, 2013.
26. Mukherjee, A., Vaidya, A. and Yecko, P., Stability of shear flow of ferrofluids, **Magnetohydrodynamics**, Vol. 49, No. 3/4, 505-511, 2013.
27. B.J. Chung, McDermid, K. and A. Vaidya, On the affordances of the MaxEP principle, **European Physical Journal B: Condensed Matter and Complex Systems**, 87 1 (2014) 20.
28. Fiordilino, J., Massoudi, M. and Vaidya, A., Pressure driven flow and heat transfer in inhomogeneous fluids, **Applied Mathematics and Computation**, 243, 184-196, 2014.
29. Massoudi, M., G. Sanchez, Soltau, S., Vaidya, A. and Varner, J., Some Experimental Observations on the Pressure Driven Flow of Biomass Suspensions, **International Journal of Engineering Science**, 85, 58-65, 2014.
30. M. Munakata and A. Vaidya, Experiments in Project- and Theme-based Learning to Encourage Creativity in Science, **Journal of College Science Teaching** (National Science Teacher's Association), 45 (2), 48, 2015.
31. R. Allaire, Guerron, P., Nita, B., Nolan, P., and Vaidya, On the Equilibrium Configurations of Flexible Fibers in a Flow, **International Journal of Nonlinear Mechanics**, 69, 157-165, 2015.
32. E. Forgoston, L. Hentschker, S. Soltau, P. Truitt and A. Vaidya, Thermally induced particle aggregation on a liquid surface, **Physics Letters A**, Volume 380, Issues 1–2, 8, Pages 227–231, 2016.
33. Ghosh, P., Kumar, A., Rangachari, V. and Vaidya, A., Determination of Nucleation Mass for Amyloid- $\beta$ , **Mathematical Biosciences**, 273, 70–79, 2016.

34. B.J.Chung, M. Cohrs, W. Ernst, G.P. Galdi and A. Vaidya, Wake-cylinder interaction at low and intermediate Reynolds numbers, **Archive of Applied Mechanics**, 86(4), 627-641, 2016.
35. D. Baron, H. Su and A. Vaidya, Splash dynamics of paint on dry, wet and cooled surfaces, **Fluids (Special Issue: Rheology and Thermo-mechanics of non-Newtonian Fluids)**, 1(2), 12, 2016.
36. B.J. Chung, D. Platt and A. Vaidya, The Mechanics of Clearance in a non-Newtonian Lubrication Layer, **International Journal of Nonlinear Mechanics**, Volume 86, November 2016, Pages 133–145.
37. Nita, B., Nolan, P., and Vaidya, Numerical Study of Body Shape and Wing Flexibility in Fluid-Structure Interaction, **Computational and Applied Mathematics**, 36(4), 1733-1746, 2017.
38. D. Castillo, B. Chung, K. Schnitzer, K. Soriano and A. Vaidya, Metastable states in orientation of hinged symmetric bodies in a flow, **International Journal of Engineering Science**, Volume 111, 19-27, 2017.
39. E. Leszczynski, Monahan, C., M. Munakata and A. Vaidya, The Windwalker Project: An Open-Ended Approach to Physics Instruction, **Journal of College Science Teaching** (National Science Teacher's Association), Vol. 46, No. 6, 27-33, 2017.
40. Pratip Rana, Dexter N. Dean, E. Steen, Ashwin Vaidya, Vijayaraghavan Rangachari and Preetam Ghosh, Fatty Acid Concentration and Phase Transitions Modulate A $\beta$  Aggregation Pathways, **Scientific Reports (Nature publications)**, 7: 10370 | DOI:10.1038/s41598-017-09794-x, 1-16, 2017.
41. B. Chung, B. Ortega, A. Vaidya, Entropy Production in a Fluid-Solid System Far From Thermodynamic Equilibrium, **European Physical Journal E: Soft Matter and Biological Physics**, 40: 105, 2017. DOI: 10.1140/epje/i2017-11595-32017.
42. Pratip Rana, Dexter N. Dean, Ashwin Vaidya, Vijayaraghavan Rangachari and Preetam Ghosh, A review of experiments and modeling of A $\beta$ -lipid/Surfactant interactions, **Biophysica Bichimica Acta-Biomembranes**, 1860, 1652-1662, 2018.
43. M. Massoudi and A. Vaidya, Simplicity and Sustainability: Pointers from Ethics and Science, **Sustainability** (special issue on *Sustainability and Ethics: Reflections on the UN Sustainable Development Goals*), 10(4), 1303, 2018.
44. C. Monahan, M. Munakata and A. Vaidya, Creativity as an Emergent Property of a Complex Educational System, **Northeast Journal of Complex Systems (NEJCS)**, Vol. 1, No. 1, 2019.
45. Araneo, J., Chung, B. J., Cristaldi, M., Pateras, J., Vaidya, A., & Wulandana, R. (2019). Experimental control from wake induced autorotation with applications to energy harvesting. **International Journal of Green Energy**, 16(15), 1400-1413.
46. Monahan C, Munakata M, Vaidya A. Engaging in probabilistic thinking through play. **Mathematics Teacher: Learning and Teaching PK-12**. 2020 Sep 1;113(9):e18-23.

47. Ghosh, P., Rana P., Rangachari V., Saha J., Steen E., and Vaidya A. (2020)., A game theoretic approach to deciphering the dynamics of amyloid- $\beta$  aggregation along competing pathways, *Journal of the Royal Society Open Science*, 7: 191814. ( <http://dx.doi.org/10.1098/rsos.191814>)
48. Chung BJ, Vaidya A. Self-organization in physical and biological systems: Comment on" Morphogenesis as Bayesian inference: A variational approach to pattern formation and control in complex biological systems" by Franz Kuchling et al. *Physics of life reviews*. 2020 Jul;33:115-8.
49. Monahan, C., Munakata, M., Vaidya, A., & Gandini, S. Inspiring Mathematical Creativity through Juggling. *Journal of Humanistic Mathematics*, 10(2), 291-314, 2020.
50. Karlson, Matthew, Bogdan G. Nita, and Ashwin Vaidya. "Numerical Computations of Vortex Formation Length in Flow Past an Elliptical Cylinder." *Fluids* 5.3 (2020): 157.
51. Ghosh, P., Pateras, J., Rangachari V. and Vaidya A , A Network Thermodynamic Analysis of Amyloid Aggregation along Competing Pathways, *Applied Mathematics and Computation*, 393 (15), 125778, March 2021.
52. Munakata, M., Vaidya, A., Monahan, C., & Krupa, E. (2021). Promoting Creativity in General Education Mathematics Courses. *PRIMUS*, 31 (1), 1-22. (Selected 2021 Editor's Pick: <https://primusmath.com/2022/01/03/editors-picks-2021/>)
53. David Foote, B. Chung, A. Vaidya and R. Wulandana, Vortex-Induced Auto-Rotation of Bladeless Turbine Models, accepted for publication in *International Journal of Green Energy*, April 2021 (<https://doi.org/10.1080/15435075.2021.1941044> ).
54. A. Vaidya, Entropy Binding: A General Semantics of Environmentalism, *ETC: A Review of General Semantics*, Volume 77 (Issues 3-4), 2021.
55. Katherine Fitzgerald M. Massoudi and A. Vaidya, A Modified Least Action Principle with Dissipation, *European Journal of Mechanics B (Fluids)*, Volume 89, September–October 2021, Pages 301-311.
56. John O'Meara and A. Vaidya, A Network Approach to Curriculum Design, *Entropy (Complexity Section)*, 23(10), 1346, 2021.
57. De Bari, B., Dixon, J., Pateras, J., Rusling, J., Satterwhite-Warden, J., & Vaidya, A. (2022). A thermodynamic analysis of end-directed particle flocking in chemical systems. *Communications in Nonlinear Science and Numerical Simulation*, 106, 106107.
58. Jack Conley, Estefania Parra and A. Vaidya, A Sematic Guide for the Climate Perplexed, accepted in *ETC: A review of general semantics (Institute of General Semantics)*. 2022.
59. Munakata, M., Vaidya, A., & Vanderklein, D. (2022). Interdisciplinary Lessons on Energy and Entropy. *Journal of College Science Teaching*, 51(5).

60. Chung, Bong J., Benjamin De Bari, James Dixon, Dilip Kondepudi, Joseph Pateras, and Ashwin Vaidya. (2022). "On the Thermodynamics of Self-Organization in Dissipative Systems: Reflections on the Unification of Physics and Biology" *Fluids* 7, no. 4: 141. <https://doi.org/10.3390/fluids7040141>
61. P. Ghosh, J. Pateras and A. Vaidya, Network thermodynamics-based scalable compartmental model for multi-strain epidemics, *Mathematics* (MDPI), Special Issue "Mathematical Methods and Models in Epidemiology", 2022, 10(19). <https://www.mdpi.com/2227-7390/10/19/3513>
62. J. Keenan, M. Munakata, J. O'Meara, A. Vaidya and I. Wambacq (2022), On the Impact of the Self in a Complex Knowledge Network, *International Journal of Complexity in Education*, 3(2), 53-78.
63. De Bari, B., Dixon, J., Kondepudi, D., & Vaidya, A. (2023). Thermodynamics, organisms and behavior. *Philosophical Transactions of the Royal Society A*, 381(2252), 20220278.
64. Munakata, M., Monahan, C., Krupa, E., & Vaidya, A. (2023). Non-traditional assessments to match creative instruction in undergraduate mathematics courses. *International Journal of Mathematical Education in Science and Technology*, 54(7), 1272-1287.
65. De Bari, B., Kondepudi, D. K., Vaidya, A., & Dixon, J. A. (2024). Bio-analog dissipative structures and principles of biological behavior. *BioSystems*, 105214.
66. O'Meara, J., Carlson, M. P., O'Bryan, A. E., & Vaidya, A. (2025). Network-Based Trajectory Analysis of a Precalculus Course. *PRIMUS*, 35(2), 188-213.

#### REFEREED BOOK CHAPTERS

67. A.Vaidya and G.A.J. Sparling, The perturbed massless, wave equation with singular external potential, *Trends in Mathematical Physics Series*, Ed. Charles Benton, Nova Science Publishers, 209-236, 2004.
68. R.Camassa, B.J.Chung, P. Howard, R.M. McLaughlin and A.Vaidya, Vortex induced oscillations of cylinders at low and intermediate Reynolds numbers, *Advances in Mathematical Fluid Mechanics (Book Series)*, Ed. Sequeira, A. and Rannacher, R., Springer Verlag, 135-145, 2010.
69. Vaidya, A., MEP and stable configurations in fluid solid interactions, *Understanding Complex Systems (Book Series): Beyond the Second Law: Entropy Production and Non-Equilibrium Systems*, Eds. Dewar R.C., Lineweaver C., Niven R. & Regenauer-Lieb K., Springer Verlag, Chapter 13, pages 257-276, 2014.
70. B. Chung, B. Martinez and A. Vaidya, A two-phase model for mucosal aggregation and clearance in the human tear film, accepted in (Springer *Book Series: Advances in Mathematical Fluid Mechanics*),. Book title: *Recent Advances in Mechanics and Fluid Structure Interaction with Applications*. 2022.
71. P. Ghosh, J. Pateras and A. Vaidya, Physics-informed Bias Method for Multiphysics Machine Learning: Reduced Order Amyloid- $\beta$  Fibril Aggregation, submitted to (Springer *Book Series: Advances in Mathematical Fluid Mechanics*),. Book title: *Recent Advances in Mechanics and Fluid Structure Interaction with Applications*. 2022.



72. Critical density triplets for the arrestment of a sphere falling in a sharply stratified fluid, Roberto Camassa, Lingyun Dinga, Richard M. McLaughlin, Robert Overman, Richard Parker, and Ashwin Vaidya, in (Springer Book Series: **Advances in Mathematical Fluid Mechanics**,). Book title: **Recent Advances in Mechanics and Fluid Structure Interaction with Applications**. 2022.
73. J. Dixon, M. Petersen and A. Vaidya. Ecological Foundations to the Creation of New Meaning, Response to the article *Intercorporeal dynamic functional system* by Anna Shvarts and Dor Abrahamson. Chapter for consideration in C. M. Krause, L. D. Edwards (Eds.) **The body in mathematics: Theoretical and methodological lenses**, Leiden, The Netherlands: Brill.7, 174, 2024.
74. K. Cohan, J. Dixon, A. Vaidya, Mathematical Model of Collective Behavior in Physical and Social Systems. [Accepted. To appear in Springer-Birkhauser series **Trends in Mathematics**], 2025.

#### REFEREED PROCEEDING PAPERS

75. D. Platt and A. Vaidya, Fluid Mechanics of the eye and role of the mucus layer, *Proceedings of ASME 2010 3rd Joint US-European Fluids Engineering Summer Meeting*, Paper no. FEDSM-ICNMM2010-30995 pp. 2205-2212 (doi:10.1115/FEDSM-ICNMM2010-30995), 2010.
76. S. Kadam, D. Kolluru, A. Vaidya and A. Viswanadhuni, Optimal clusters and architectures in complex networks, *Proceedings of the International Conference on Advances in Recent Technologies in Communication & Computing*, 2010, No. 51, pages 1-4.
77. M. Massoudi, G. Sanchez and A. Vaidya, An engineering approach to the pipeline transport of biomass, *Bulletin of the New Jersey Academy of Science*, 57(1), 9-11, 2013.
78. Kadam, S., Kolluru, D., Vaidya, A. and Viswandhuni, A., Service Worthy Clusters in an Evolving Network, proceedings of *Workshop at the 14th International Conference on Distributed Computing and Networking (ICDCN)*, Mumbai, India, January 3-6, 2013.
79. Chung, B.; Ortega, B.; Vaidya, A. Entropy production for the terminal orientation of a half cylinder in a flow. *Entropy, Proceedings of the 2nd Int. Electron. Conf. Entropy Appl.*, 15–30 November 2015; Sciforum Electronic Conference Series, Vol. 2, 2015, 8 pages, A013; doi:10.3390/ence-2-A013
80. Diana Thomas, John Starner, Ashwin Vaidya, Analiza Silva, S B Heymsfield and David B Allison, "New insights into the Mayer Hypothesis derived from a dynamic energy balance model." *The FASEB Journal* 31.1 Supplement (2017): 796-16.
81. P. Rana, P. Bose, A. Vaidya, V. Rangachari and P. Ghosh, Global fitting and parameter identifiability for Amyloid-beta aggregation models with competing pathways, accepted for publication in the Proceedings of 20<sup>th</sup> IEEE Conference on Bioinformatics and Bioengineering, July 2020 (**IEEE Xplore**), 6 pages, November 2020.

#### BOOKS

#### EDITED COLLECTIONS

82. A. Vaidya (Editor), *Teaching and Learning of Fluid Mechanics* (2020), MDPI.  
<https://www.mdpi.com/books/pdfview/book/2536>

83. A. Vaidya (Editor), *Teaching and Learning of Fluid Mechanics-Volume II* (2021), MDPI.  
<https://www.mdpi.com/books/pdfview/book/4335>



84. F. Carapau and A. Vaidya, *Recent Advances in Mechanics and FSI and its Applications (The Bong Jae Chung Memorial Volume)*, edited volume, published by Springer-Birkhauser, Book Series: *Advances in Mathematical Fluid Mechanics*, November 2022. <https://link.springer.com/book/9783031143267>
85. F. Carapau, F. Minhoz, Mourad Bezzeghoud and A. Vaidya, *Advances in Mathematical Modeling in Science, Engineering, and Social Sciences*, Edited volume, published by Springer-Birkhauser, Book Series: *Trends in Mathematics*, to appear in 2025. <https://link.springer.com/book/9783032102805#overview>

#### OTHER (ESSAYS/POPULAR ARTICLES/EDITORIALS)

86. A. Vaidya, Editorial article: "Teaching and Learning of Fluid Mechanics – Volume 2", *Fluids*, MDPI, 2021, in press.
87. A. Vaidya, Editorial article: "Teaching and Learning of Fluid Mechanics", *Fluids*, MDPI, 2020, 4 pages.
88. A. Vaidya, Entropy: A Story of Science as Art, Invited Essay, *Creative Research Center Website*, Montclair State University, January 2011. Also featured in the *EBulletin* of Art & Science Collaborations Inc. <http://www.asci.org/artikel1146.html>
89. Munakata, M. and Vaidya, A., Experiments in Creative Science Education, *The Teaching Times – Research Academy for University Learning*, Spring Newsletter, May 2013.
90. *The Art of Science*, Magazine edited by M. Munakata and A. Vaidya, Summer 2014. <http://www.montclair.edu/csam/news/article.php?ChannelID=54&ArticleID=13311>
91. A. Vaidya, Preparing STEM Students for Post-Graduate Success, *Tech News: the New Jersey Technology Council Magazine*, 2015.
92. Vaidya, A. *Creative resonance: Fostering 'Aha!' moments through interdisciplinary connections*, invited guest essay for *Creative Research Center*, Montclair State University, for January 2019 issue. <https://www.montclair.edu/creative-research-center/this-month-at-the-crc/>

#### SUBMITTED

1. John O'Meara, Vlad Nita and A. Vaidya, Mathematical Affect and Meaning-Making: Exploring the Diversity of Students' Learning in College Mathematics. [Submitted, 2025]
2. John O'Meara and A. Vaidya, A Complex Systems Approach to Modeling the Learning Curve. [Submitted, 2025]
3. Da Silva, A., J. Dixon, J. O'Meara, A. Vaidya, and N. Vedwan. A Complexity Based Analysis of the Science-Humanities Divide. [Submitted, 2025]

#### THESES

1. A.Vaidya, Investigations into the circumstellar environment of Herbig Ae/Be stars, Dept. of Physics & Astronomy, **B.Phil. Thesis**, University of Pittsburgh, 1995.
2. A.Vaidya, On the classical and quantized solutions of the perturbed wave equation with external potential, **M.S. Thesis**, Dept. of Mathematics, University of Pittsburgh, 1999.
3. A. Vaidya, Orientation of Rigid Bodies Sedimenting in Newtonian and Non-Newtonian Fluids, **Ph.D. Thesis**, Dept. of Mechanical Engineering, University of Pittsburgh, 2004.

#### IN PREPARATION

##### Articles

1. A. Vaidya, and N. Vedwan. Two Cultures Revisited: A Network Based Analysis of the Man-Nature Divide and its Implications for Climate Change.
2. J. Dixon, A. J. O'Meara, J. and Vaidya, A. A Complex Systems Approach to Meaning-Making Across Disciplines.
3. Stephen Conte, Arup Mukherjee, Sevdalin Semov, Ashwin Vaidya and Kevin Vargas, Optimal Conditions for Energy Extraction from the Small-Scale VAWT.
4. Megan Akdemir, John O'Meara, Vlad Nita, Stephanie Smith and Ashwin Vaidya, Teaching Styles and Its Impact on Mathematical Meaning Making.
5. N. Vedwan and A. Vaidya, Climate Change Education – A Living Lab Experiment on College Campus.
6. John O'Meara and A. Vaidya, A critique of the notion of 'objectivity' in math and science. [for submission to **ETC**]
7. A. Vaidya, A General Semantics of Creativity Through the Metaphor of Play. [for submission to **ETC**]

##### Books

1. F. Carapau, F. Minhos and A. Vaidya, **Advances in Mathematical Modeling in Science, Engineering and Social Science**, Trends in Mathematics Series, under contract with Springer-Birkhauser, 2024.
2. A. Vaidya and N. Vedwan, **Systems Theory of Climate Change: Mathematical and Sociological Models Applied to a Complex System**, De Gruyter Series in Mathematics and Life Sciences (978-3-11-137898-5) – under contract with DeGruyter Press, 2024.

3. M. Massoudi and A. Vaidya, *Introduction to the Mathematical Theory of Complex Fluids*.
  4. M. Munakata and A. Vaidya, *Reggie and the Math Jeans*.
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## GRANTS AWARDED

### EXTERNAL GRANTS

1. *Experimental and Numerical Study of Energy Generation using Vertical Axis Wind Turbine*, **Clean Tech Research and Development (R&D) Voucher, CSIT, State of NJ**, MSU-SWIND Collaboration, Co-Investigators at MSU: Ashwin Vaidya and Arup Mukherjee, 2022-2023, \$15,000.
2. *Cultivating Research, Innovation and Talent*, **Opportunity Meets Innovation Challenge (OMIC) Grant, funded by the State of NJ**, 2021-2023, Participant/Senior Personnel responsible for \$236,000 of the total \$510,000.
3. *The Civic Learning Demonstration Project: Pursuing Frameworks for Engaged Departments*, **Corella & Bertram F. Bonner Foundation**, (PI: Community Engaged Teaching and Learning Initiative, Vaidya-Senior Personnel representing and leading the Department of Mathematics), 2021-2022, \$26,000.
4. *Collaborative Research: Dynamics of surfactant-amyloid beta protein interactions during self-assembly* – Supplemental Grant, **NSF Particulate and Multiphase Processes** 1933096, \$6000, 2019-2020.
5. *Collaborative Research: Dynamics of surfactant-amyloid beta protein interactions during self-assembly*, **NSF Particulate and Multiphase Processes** 1802641 (ENG/CBET/PMP), (PI-Vaidya, collaborators Dr. Vijay Rangachari, U. Southern Mississippi and Dr. Preetam Ghosh, Virginia Commonwealth U.), Total - \$495,000, MSU amount-\$111,000, 2018-2021.
6. *Engaged Learning through Creativity in Mathematics and Science*, **NSF IUSE** Grant #1611876 (Co-PI: Vaidya, PI-Mika Munakata), \$300,000, 2016-2019.
7. *The Art of Making Sustainable Science* (PI-Vaidya, Co-PI-Mika Munakata), **American Physical Society grant**, \$10,000, 2012-2013.
8. *Acquisition of an Imaging System for the Study of Complex Fluids*, **NSF MRI grant** 1229113 (PI-Vaidya, Co-PIs Arup Mukherjee, David Trubatch and Philip Yecko), \$170,000, 2012-2015.

### INTERNAL GRANTS

9. *Networks and Curricular Design*. CSAM Faculty Student Summer Research Award, \$5000, 2022.
10. *Experiential Learning and Skill Development through Ethics in STEM* (Co-PI with Jessica Miller, Maisa Taha, Sangeeta Parashar, Bryan Murdock and Meiyin Wu), CSAM SELF-Seed Grant, Montclair State University, \$3500, 2019.

11. *Non-equilibrium thermodynamics and pattern formation* (PI), Separately Budgeted Research award, Montclair State University, \$4000, 2014.
  12. *Creativity in Mathematics and Sciences* (as Co-PI with Mika Munakata), Summer Grant-Proposal Development grant, Montclair State University, \$5500, 2011.
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## PRESS COVERAGE

- *Featured in the **The Talking Cure Podcast: Mathematics and Juggling***, Hosted by Jed Wheeler with Mika Munakata, Arts and Cultural Programming, Montclair State University, November 2020, <https://www.peakperfs.org/podcasts/>
  - **Montclair Local** (Newspaper) published an article about the collaboration between the Arts and Cultural Programming show called 'Smashed' and our project titled "Engaged Learning Through Creativity in Mathematics and Science. December 15, 2018. <https://www.montclairlocal.news/wp/2018/12/13/smashed-gandini-juggling-montclair/>
  - **Wall Street Journal** interview about development and teaching of the University wide Creative Thinking (CRTH 151) course at Montclair State University, March 2014 (with Provost Willard Gingerich).
  - The Second Annual Creative Research Center Symposium: *The Scientific Imagination: Where Do Ideas Come From?* Interviewer, Dr. Neil Baldwin. **Interview broadcasted on NJTV.** <http://www.njvid.net/show.php?pid=njcore:26250>
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## TALKS/PRESENTATIONS

### INVITED TALKS

(All talks delivered by A. Vaidya)

1. Invited Speaker, Department of Mathematics, Center for Investigations in Mathematics and its Applications, University of Evora, Evora, Portugal. May 16<sup>th</sup>, 2025.
2. Invited Speaker, Department of Mathematics, Instituto Superior Technico (IST), Lisbon, Portugal. May 15<sup>th</sup>, 2025.
3. Invited Speaker, Department of Applied Sciences, Symbiosis Institute of Technology, Pune, India. January 10<sup>th</sup>, 2025.
4. Invited Speaker, *2nd International Conference on Recent Advances in Fluid Mechanics and Nanoelectronics (ICRAFMN 2024)* organized by Department of Mathematics and Statistics, Manipal University Jaipur, India, July 10-12, 2024.

5. Invited Speaker (Online), The 2nd International Workshop on Mathematics and Physical Sciences (MatPhys), July 11-12, 2024, University of Évora, Portugal.
6. Keynote lecture, *International Conference on Computational Modeling in Science and Engineering (ICCMSE-2023)*, October 28-30, 2023.
7. Invited Keynote Speaker, Kinnelon High School Science Symposium, May 18<sup>th</sup>, 2023.
8. Invited speaker, *College Civic Learning Forum*, organized by the Civic Learning and Democracy Engagement Coalition, December 13-14, 2022.
9. Invited Speaker, *NetSciEd Satellite event, Network Science Conference*, July 11-24, 2022.  
<https://netsci2022.net/>
10. Invited Speaker, *Innovations in Teaching Math to Pandemic-Affected Students*, MSU Summer Institute for Teaching and Learning, Montclair, NJ, June 9th 2022.
11. Invited Speaker, *Conference on the Role of Science in Emerging Technologies*, RBSET 2022, GMRIIT and NIT Mizoram, India (Virtual), March 9-12, 2022.
12. Invited Keynote Speaker, *8th International Conference on Mathematics and Computing ICMC 2022*, ( An Online Conference), Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, Tamil Nadu, India, Jan 6-8, 2022.  
<https://vit.ac.in/icmc2022/>
13. Invited speaker, National Workshop on *Advances in Applied Mathematics and Computational Methods*. 07- Jan - 2022 to 09 - Jan – 2022, VIT-AP University, Amaravati, Andhra Pradesh, India.  
[https://vitap.ac.in/wp-content/uploads/2021/12/Brochuer\\_3-Days-Workshop-AAMCM.pdf](https://vitap.ac.in/wp-content/uploads/2021/12/Brochuer_3-Days-Workshop-AAMCM.pdf)
14. Invited speaker (Online), *Conference on Complex Systems 2021, Satellite on Complexity in Education*, October 28, 2021, Lyons, France.
15. Invited speaker, (presented by collaborator Rachmadian Wulandana) *Virtual Global Renewable Energy Researchers Meet*, May 2021, Australia.  
<https://www.woodmac.com/events/global-energy-summit2021/>
16. Invited speaker, “International Conference on the Advances in Mechanics”, 26<sup>th</sup> International Conference of the International Academy of Physical Sciences (CONIAPS XXVI) and Manipal University, India, December 18-20, 2020.
17. Invited speaker, “5<sup>th</sup> International Conference on the Applications of Fluid Dynamics”, ICAFD 2020, Vellore Institute of Technology, India, December 13-15, 2020  
(<https://www.vitap.icafd.co.in/#speakers> ).

18. Invited speaker, "Current trends in Mathematical and Statistics to Engineering Applications." Department of Basic Sciences and Humanities (Mathematics), GMR Institute of Technology, India, June 25-30, 2020.
19. Featured Speaker, "A Network Thermodynamic Analysis of A-beta Aggregation along Competing Pathways ", Thermodynamics 2.0, International Association of Integration of Science and Engineering (IAISAE), Boston, MA, June 22-24, 2020. Video link: <https://youtu.be/voPQurlmGd8>  
(<http://iaisae.org/index.php/speakers/>)
20. Invited Workshop on *Creativity and Mathematics* MAA-NJ Fall Conference, October 27, 2019 (with Ceire Monahan, Mika Munakata), Essex County College, Newark.
21. "*Creativity in Teaching & Learning*", STEM Bootcamp, Montclair State University, June 4<sup>th</sup> & 6<sup>th</sup>, 2019.
22. Symposium of the Creative Research Center, Montclair State University, April 3<sup>rd</sup>, 2019 (talk and panelist).
23. STEM Pioneers Workshop, Montclair State University, March 22<sup>nd</sup>, 2019.
24. "*Complex Dynamics of Protein Aggregation in Alzheimer's Disease*", Invited talk at the Center for Collective Dynamics of Complex Systems, SUNY-Binghamton, November 28<sup>th</sup>, 2018.
25. "*Creativity as an emergent property of a complex educational system*", Invited education talk at the Center for Collective Dynamics of Complex Systems, SUNY-Binghamton, November 27<sup>th</sup>, 2018.
26. Invited speaker, Symposium on 'Physics of Self-Organization in Complex Systems: The role of fundamental physics principles, information and entropy in the change of complexity', Conference on Complex Systems (CCS2018), Thessaloniki, Greece, September 23<sup>rd</sup>-28<sup>th</sup>, 2018.
27. Invited speaker, First Meeting of Complex Systems at Worcester Polytechnic Institute, Department of Physics, Worcester Polytechnic Institute, MA, June 29<sup>th</sup>, 2018.
28. Invited speaker, Creativity in Mathematics and Science, Bergen Community College (with Mika Munakata and Ceire Monahan), June 27<sup>th</sup>, 2018.
29. Invited seminar speaker at the Division of Engineering Programs, SUNY-New Paltz, April 26<sup>th</sup>, 2018.
30. Colloquium talk at Department of Mathematical Sciences, Montclair State University (with Mika Munakata), April 23<sup>rd</sup>, 2018.
31. Invited speaker at the Fluids and Waves Seminar, Department of Mathematics, New Jersey Institute of Technology, Newark, March 26<sup>th</sup>, 2018.

32. Invited seminar speaker at the Division of Engineering Programs, SUNY-New Paltz, March 29<sup>th</sup>, 2017.
33. Invited seminar speaker at the Center for Ecological Study of Perception and Action, University of Connecticut - Storrs, March 10<sup>th</sup> 2017.
34. Invited speaker at "The Mathematical Sciences in Obesity" workshop, University of Alabama, Birmingham, Alabama, June 2016.
35. Invited talk at symposium on *Multiscale Modeling of Macromolecular Systems* at the 2015 Combined Southwest Region Meeting and the Southeastern Regional Meeting of the American Chemical Society, November 4-7, 2015.
36. Invited Talk at the Workshop on Maximum Entropy Production (MEP) 2011, Australian National University, Canberra, September 12-15, 2011.
37. Invited Talk at the 'Fluids and Waves Seminar', Department of Mathematics, NJIT, February 28, 2011.
38. Invited talk at the Department of Mathematics, Indian Institute of Science Education and Research (IISER), Pune, India, November 24, 2010 .
39. Invited talk at the Department of Mechanical and Industrial Engineering, NJIT, October 20, 2010.
40. Invited speaker, C.R.E.A.T.E., Analytics Division, Prithvi Information Solutions, Hyderabad, India, January 7, 2010 .
41. Invited talk at the Department of Mathematics, George Mason University, Fairfax, VA, April 2009.
42. Invited talk at the Department of Mathematics, University of Evora, Evora, Portugal, May 16, 2007.
43. Invited talk at the Tata Institute of Fundamental Research (TIFR), Department of Applied Mathematics, Bangalore, India, July 27, 2006.
44. Fluid Dynamics Colloquium talk at the Department of Engineering Mechanics, Jawaharlal Nehru Center for Advanced Scientific Research (JNCASR), Bangalore, India, July 25, 2006.
45. Invited talk at the International Conference in Mathematical Fluid Mechanics, Estoril, Portugal, May 21-25, 2007.
46. Colloquium talk at the Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee, September 12, 2005.



47. Complex Fluids Seminar, Department of Mathematics, Florida State University, Tallahassee, September 8, 2005.
48. Colloquium talk at the Science Division, Chatham College, Pittsburgh, May 8, 2005.
49. Invited talk at the Center for Nonlinear Analysis - Seminar Series, Department of Mathematics. Carnegie Mellon University, January 25, 2005.
50. Invited talk at the Department of Mathematical Sciences, Montclair State University, Montclair, NJ, March 2009.
51. Invited talk at the Department of Mathematics, NCA&T University, Greensboro, NC, February, 2009.
52. Invited talk at the Analytics Division, Prithvi Information Solutions, Hyderabad, India, January, 2009.
53. Invited talk at the Science Division, Chatham College, Pittsburgh, October 28, 2004.
54. Invited talk at the W.G. Pritchard Fluids Lab, Department of Mathematics, Penn State University, May 27, 2004.
55. Invited talk at the Applied Mathematics Lab, Courant Institute of Mathematical Sciences, New York University, May 6, 2004.
56. Invited talk at the Department of Mathematics, University of Houston, April 6, 2004.
57. Invited talk at the Department of Mathematics, Indian Institute of Technology, Bombay, India, Dec. 3, 2003.
58. Fluid Dynamics Colloquium talk at the Department of Engineering Mechanics, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, Dec. 17, 2003.
59. Invited talk at the First Meeting on Numerical Analysis for Applied Flow Problems, Evora, Portugal, June 20-21, 2001.
60. Invited talk at the Department of Mathematics, IST, Lisbon, Portugal, June 2001.
61. Invited talk at the Conference on Contemporary Challenges in Applied Fluid Dynamics, Capo Miseno, Italy, May 31-June 5, 2001.

#### **CONTRIBUTED PRESENTATIONS**

1. Complexity and Curriculum, *EPISTEME-10 Conference*, HBCSE, Tata Institute of Fundamental Research, Mumbai, India, January 3-6, 2025.
2. *The Semantics of Scientific Objectivity*, Symposium of the Institute of General Semantics and Alfred Korzybski Memorial Lecture, October 7-9, 2022 (A. Vaidya).
3. *Complexity and Curriculum: Examining the Role of Connectivity in a Precalculus Course*, NERCCS 2021, April, 2021 (John O'Meara\*, Stephen Eissen and A. Vaidya)
4. *An Axiomatization of Realities*, Symposium of the Institute of General Semantics and Alfred Korzybski Memorial Lecture, October 9-11, 2020 (A. Vaidya\*).
5. A Network Thermodynamic Analysis of A-beta Aggregation along Competing Pathways, NERCCS 2020, April 2-4, 2020 (Joseph Pateras\* and A. Vaidya)
6. *Least Action Principle Applied to a Non-Linear Damped Pendulum*, NERCCS 2019, April 3-5, 2019 (Katherine Rhodes\* and A. Vaidya)
7. *Entropy production and Segre-Silberberg effect*, NERCCS 2019, April 3-5, 2019 (Joseph Pateras\* and A. Vaidya)
8. *Juggling: Mathematical exploration through play*. MAA Session on Fostering Creativity in Undergraduate Mathematics, American Mathematical Society Annual Conference, January 16-19, 2019 (Ceire Monahan\*, Mika Munakata and A. Vaidya).
9. *Experiments in Problem Based Learning in Classical Mechanics*, NJAAPT Conference on Physics Education, Bergen Community College, NJ, November 16<sup>th</sup> -17<sup>th</sup>, 2018 (A. Vaidya\*).
10. *Creativity as an Emergent Property of Complex Educational System*, Symposium on Complex Systems in Education, Conference on Complex Systems (CCS2018), Thessaloniki, Greece, September 23<sup>rd</sup>-28<sup>th</sup>, 2018 (A. Vaidya).
11. American Society of Engineering Education, University of Hartford Connecticut, April 27-28, 2018 (Doni Wulandana\* – SUNY New Paltz and A. Vaidya).
12. *Self-organization and pattern formation in fluid-solid interactions*, First Northeastern Regional Conference on Complex Systems (NERCCS 2018), Binghamton, NY, April 11-13, 2018 (A. Vaidya\*).
13. Annual Conference on Research on Undergraduate Mathematics Education (RUME) in San Diego, CA, February 22<sup>nd</sup>-24<sup>th</sup> 2018 (with Mika Munakata, Erin Krupa).
14. Fluid Dynamics of Painting, MAA – NJ Section Meeting, Georgian Court University, November 4<sup>th</sup>, 2017 (A. Vaidya\*).
15. Transforming STEM Higher Education Conference, San Francisco, CA, November 2-4, 2017 (poster presentation with Mika Munakata).

16. Presentation on *Creativity in Math and Science*, Showcase on University Learning, Montclair State University, May 10, 2017 (with Mika Munakata).
17. 2<sup>nd</sup> International Online Conference on Entropy and Its Applications, November 15-30, 2015 (A. Vaidya\*).
18. 68<sup>th</sup> Annual Division of Fluid Dynamics Meeting, American Physical Society, Pittsburgh, November 22-25, 2015 (A. Vaidya\*).
19. Annual meeting of the American Physics Society, March 4th 2014, Denver, Colorado(lecture at the Physics education session with M. Munakata).
20. 66<sup>th</sup> Annual Division of Fluid Dynamics Meeting, American Physical Society, Pittsburgh, November 23-26, 2013 (A. Vaidya\*).
21. 57<sup>th</sup> Annual Meeting of the Biophysical Society (with Andrew Mauro), Philadelphia, February 2013 (A. Mauro\* and A. Vaidya\*).
22. Laminar flows of ferrofluids-Stability Studies, with Arup Mukherjee and Phil Yecko, presented at the International meeting of magnetic materials, New Delhi, India, January 2013 (talk by A. Mukherjee).
23. Division of Fluid Dynamics, American Physical Society, Baltimore, November 20-22, 2011 (A. Vaidya\*).
24. 48<sup>th</sup> Annual meeting of the Society of Engineering Science, Chicago, IL, October 12-14, 2011 (A. Vaidya\*).
25. Workshop on Creativity in Math and Science, Showcase on University Learning, Montclair State University, May 4, 2011 (with Dr. Mika Munakata).
26. 56<sup>th</sup> annual meeting of the New Jersey Academy of Sciences, April 9, 2011.
27. Society of Engineering Science Conference, Ames, Iowa, October 4-6, 2010 (A. Vaidya\*).
28. ASME 2010 Joint US-European Fluids Engineering Meeting, Montreal, Canada, August 2-5, 2010.
29. SIAM Student Chapter, Montclair State University, Montclair, NJ, November 2009.
30. American Physical Society, Division of fluid mechanics, San Antonio, TX, November, 2008.
31. American Physical Society, Division of fluid mechanics, Salt Lake City, Utah, November, 2007.
32. Southeastern Atlantic Mathematics Conference in Hampton, Virginia, October 2007.

33. American Physics Society, March 2006 Meeting, Baltimore, MD.
34. American Mathematical Society Sectional Conference, Pittsburgh, November 3, 2004.
35. American Mathematical Society International Conference, Bangalore, India, December 2003.
36. Society of Rheology Conference, South Carolina, Feb. 2001.
37. National Meeting of the American Astronomical Society, Pittsburgh, PA, 1995.
38. National Meeting of the American Astronomical Society, Minneapolis, MN, 1994.

#### WORKSHOPS/PANELS

1. Conducted workshop for students in Department of Mathematical Sciences on “*Math Jobs in Industry*”, June 10<sup>th</sup>, 2019, October 24, 2019.
2. Panelist on *Bridging the gap between theory and experiments in Nanomedicine* at the 2015 Combined Southwest Region Meeting and the Southeastern Regional Meeting of the American Chemical Society, November 4-7, 2015.
3. Panelist in the *The First Annual Symposium of the Creative Research Center: The Scientific Imagination*, Spring 2012.
4. Participant and Teaching Assistant at the International School on Biomathematics, Bioengineering and Clinical Aspects of Blood Flow, MSRI (Berkeley, CA), July 22-August 09, 2002.
5. Participant at the IMA Workshop on Finite Dimensional Topology, University of Iowa, June 1998.

#### OUTREACH TALKS

1. *The Talking Cure Podcast: Mathematics and Juggling*, Conversation between Jed Wheeler, Mika Munakata and Ashwin Vaidya, Arts and Cultural Programming, Montclair State University, November 2020, <https://www.peakperfs.org/podcasts/>
2. Public lecture titled “Mathematics in Unexpected Places” at the Kasser Auditorium (with Mika Munakata), Montclair State University, December 14<sup>th</sup>, 2018. This was a sneak-peek show for the Sean Gandini show titled “Smashed”.

3. Visiting Scientists lecture at East Brook Middle School, Paramus, NJ, December 6th, 2017.
4. Guest lecturer on Creativity in Math and Science, STEM Pioneers Course, Montclair State University, September, 2017.
5. Guest lecturer in Freshman Seminar (Math 102) for incoming majors in Mathematical Sciences, Fall 2017.
6. Visiting scientist lecture at St. Francis School, April 21, 2016.
7. Visiting scientist lecture at Middlesex Middle School, January 28, 2016.
8. Public lecture on Art and Science at the Kasser Auditorium (with Mika Munakata), Montclair State University, March 20<sup>th</sup>, 2014. This was a sneak-peek show for Liz Lerman's show titled "A Matter of Origins".

#### EVENTS ORGANIZED

1. Program Organizing Committee, Physics of Self Organization in Complex Systems, Conference on Complex Systems (CCS) 2025, Siena, Italy | September 1–5, 2025
2. Program Committee of International Conference on Complex Systems Modeling, Analysis and Applications (<https://ic2sma2-2025.christuniversity.in/>). February, 2025.
3. International Advisory Board Member, International Conference on Recent Advances in Mechanical Engineering & Material Science (ICAMEMS-22), Vellore Institute Of Technology, Amravati, India, January 2022.
4. International Advisory Board Member, 66<sup>th</sup> Meeting of the Indian Society of Theoretical and Applied Mechanics, Vellore Institute of Technology, Amaravati, India, December 2021.
5. International Advisory Board Member, International conference on Applications of Fluid Dynamics, Vellore Institute of Technology, Amaravati, India, December 2020.
6. Scientific Committee, VII Workshop on Computational Data Analysis and Numerical Methods (VII WCDANM), ONLINE, Portugal, September 10-12, 2020
7. Organizing Committee Member, 2019 Northeast Conference for Complex Systems. State University of New York, Binghamton, April 3-5, 2019.
8. Workshop on *Creativity in Math and Science*, Montclair State University, June 2017, April 2018.

9. SHIP day, Graduation event for Science Honors Innovation Program, Montclair State University, April 2015, 2016, 2017 and 2018.
  10. Physics & Art Exhibition, April 24, 2010; March 23, 2011; May 2, 2012; May 5<sup>th</sup> 2013 and May 2<sup>nd</sup> 2014, Montclair State University, NJ.
  11. Organizing committee, Montclair State University Research Symposium, April 22, 2012; April 22, 2013 and April 2014.
  12. Symposium on Fluid-Solid Interaction, 48<sup>th</sup> Annual Meeting of the Society of Engineering Science, Chicago, October 12-14, 2011 (with Dr. Mehrdad Massoudi).
  13. Member of the Technical Program Committee of CoNeD 2013, Workshop at the 14th International Conference on Distributed Computing and Networking (ICDCN), Mumbai, India, January 3-6, 2013.
  14. Workshop on *Creativity in Math and Science* (with Mika Munakata), Montclair State University, June 2017.
  15. Scientific Committee Member for the 4<sup>th</sup> International Conference on Computational Data Analysis and Numerical Methods, October 2017, Beja Polytechnical Institute, Portugal.
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## TEACHING EXPERIENCE

### COURSES TAUGHT

Department of Mathematical Sciences, Montclair State University (2009-current). Dates indicated since 2013.

- PHYSICS COURSES
  - *PHYS 193 - College Physics I* (F2013, F2014, SU2013, SU2014, SU2015, SU2016)
  - *PHYS 194 - College Physics II* (SP2014, SU2013, SU2014, SU2015, SU2016)
  - *PHYS 320 - Thermodynamics*
  - *PHYS 210 - Classical Mechanics* (F2013, F2014, F2015, F2016, F2018)
  - *PHYS 377 - Mathematical Physics* (F2017, S2012)
  - *PHYS 191 - University Physics I* (F2018, F2015)
  - *PHYS 192 - University Physics II* (S2013, S2014, S2015, S2016, S2019)
  - *PHYS 109 - Energy and Climate Change* (Online course, W2018)
  - *PHYS 495 - Lab Research in Physics* (SU2013, F2014, S2014, SU2015, F2015, S2015, F2016, S2016, F2017, S2017)

- MATHEMATICS COURSES
  - *MATH 122 - Calculus I (F2019, S2020)*
  - *MATH 368 - Fluid Mechanics (S2019, S2015, S2013, S2011)*
  - *MATH 106 - Contemporary mathematics for everyone (F2016)*
  - *MATH 468 - Mathematical Modeling (F2018)*
  - *MATH 698 – Master’s Thesis (multiple semesters)*
  - *MATH 690 – Graduate Independent Study (multiple semesters)*
  - *MATH 420 – Differential Equations (F2020)*
  - *MATH 497/498 (F2015, S2015, S2016)*
  - *MATH 495 - Independent Study in Mathematics*
    - *Biofluid dynamics*
    - *Mathematical Biophysics*
    - *Complexity Theory and its Applications*
    - *Fluid Structure Interaction*
    - *Nonequilibrium Thermodynamics*
- HONORS COURSES
  - *HONP210 – Honors Seminar in Science (3 semesters)*
  - *HONP 211 Honors Seminar in Contemporary Issues in Science (scheduled for Spring 2021)*
- CREATIVE THINKING
  - *CRTN 151 - Creative Thinking*

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Department of Mathematics, University of North Carolina, Chapel Hill, 2006-2009:

- *Differential Equations 1*
- *Advanced Differential Equations*
- *Calculus in three dimensions*
- *Linear Algebra*
- *Mathematical Methods in the Physical Sciences*

Department of Mathematics, Florida State University, 2005-2006:

- *Calculus 1*
- *Calculus 2.*

Department of Mathematical Science, Carnegie Mellon University, 2004-2005:

- *Calculus 1*
- *Linear Programming*

- *Introduction to Mathematical Software.*

Department of Science, Chatham College, Fall 2004:

- *Math Literacy for non-science majors.*

Department of Mathematics, Robert-Morris University, 1999-2004:

- *Pre-College Algebra*
- *College Algebra*
- *Applied Calculus 1*
- *Applied Statistics 1*
- *Applied Statistics 2*
- *Operations Management.*

Department of Science, Robert-Morris University, 1999-2004:

- *Astronomy 101.*

Department of Physics, Community College of Allegheny County, 1998-1999:

- *Physics for non-science majors (with lab)*
- *Physics 1 (with lab).*

Department of Mathematics, University of Pittsburgh, Fall 1998:

- *Calculus 2 (with Mathematica Software).*

#### AS TEACHING ASSISTANT

- Department of Mathematics, University of Pittsburgh, 1995-1999. Conducted recitation sections, graded and gave occasional lectures for *Calculus 1*, *Calculus 2*, *Calculus 3*, *Online Calculus 1*, *Business Calculus*, *College Algebra*.
- Department of Mechanical Engineering, 1999-2003. Graded and gave occasional lectures for *Freshman Engineering*, *Fluid Dynamics*, *Vibrations*, *Continuum Mechanics* and *Differential Eqns.*

#### OTHER

1. Served as Teaching Assistant for course in Continuum Mechanics at Workshop on Biomathematics, MSRI (Berkeley), June 2002.
2. Supervised Student for Independent Study in Physics I at Department of Science, Robert Morris University.
3. Gave guest-lectures in graduate Continuum Mechanics, Mathematical Methods for Engineers and Advanced Fluid Dynamics courses at the University of Pittsburgh.

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#### MENTORING EXPERIENCE



**RESEARCH ASSISTANTS**

1. David Baron, Research Scholar, Complex Fluids Laboratory, August 2019-2020.

**DOCTORAL STUDENTS**

1. Secondary Thesis Advisor/ External Committee Member, Joseph Pateras, Ph.D. student at the Department of Computer Science, Virginia Commonwealth University, Richmond, VA, September 2020 - continuing,
2. Secondary advisor for John O'Meara, Ph.D. candidate in Mathematics education at Montclair State University. Thesis topic: A quantitative constructivist approach to teaching and learning through dynamic network modeling. Fall 2022 – continuing.

**GRADUATE RESEARCH STUDENTS (MS)**

1. Kaitlyn Cohan, September 2024-continuing. MS (Mathematics). Topic: Self Organization in Physico-Chemical Systems.
2. Vlad Nita, January 2024 – continuing. BS/MS (Math). Mathematical Modeling of Autorotation.
3. Kevin Vargas, Department of Mathematics, MS (Math). Fall 2023-continuing. Topic: Computational and Experimental Study of Vertical Axis Wind Turbines.
4. Stephen Conte, Department of Mathematics, BS(Math)/MS (Math). Fall 2022-May 2024. Topic: Mathematical Modeling of Auto-rotating Bodies with Applications.
5. Ana Jesus Da Silva, Department of Mathematics, MS (Math with concentration in Mathematics education), Fall 2021 – May 2023. Topic: *Meaning making through connections: A network theory approach to students' view of their undergraduate learning experience.*
6. Katherine Yarusso, Department of Mathematics, BS(Math)/MA (Social Research Analysis), Fall 2021-May 2023. Topic: Mathematical Analysis of Social Conflict.
7. John O'Meara, M.S. Mathematics, Fall 2020 – May 2022. Thesis topic: *Complexity and Curriculum*. John is working towards his PhD in Math Education at MSU since the fall of 2022.
8. Brandon Martinez, M.S. Applied Mathematics, January 2021 – December 2021. Master's Capstone Project topic: *Ocular fluid dynamics.*
9. Stephen Essien, M.S. Pure and Applied Mathematics, January 2020 – present. Thesis topic: *Complexity theory and its applications to education.* (Incomplete)
10. Karima Bencharot, M.S. Applied Mathematics, 12/2019 – 05/2021. Master's Capstone Project Report topic: *Competing Pathways in Modeling Protein Aggregation.*

11. Joseph Pateras, 5 year B.S. Physics/M.S. Pure and Applied Mathematics, Spring 2018 – May 2021. Thesis topic: *Non-equilibrium thermodynamics of Physical and Chemical systems*. Joseph is pursuing his PhD in Computer Science and Bioinformatics at Virginia Commonwealth University.
12. Katherine Rhodes, M.S. Pure and Applied Mathematics, Spring 2017 – December 2018. Thesis topic: *Principle of Least Action applied to the Nonlinear Damped Pendulum*.
13. Edward Steen, M.S. Pure and Applied Mathematics, Spring 2016 – December 2017. Thesis topic: *Optimal pathway in Protein aggregation networks*
14. David Baron, M.S. Pure and Applied Mathematics, Fall, 2014-Summer 2017. Thesis topic: *The fluid dynamics of watercolor painting: experiments & modeling*.
15. Blas Ortega, M.S. in Pure and Applied Mathematics, 2014-2016, Thesis topic: *Application of nonequilibrium thermodynamics to pattern selection in fluid-solid interaction*, May 5<sup>th</sup>, 2016.
16. Peter Nolan, M.S. in Pure and Applied Mathematics, 2013-2015, Thesis topic: *Numerical study of flow-structure interaction and implications for biological design*, May 5<sup>th</sup>, 2015. Peter is completed his Ph.D. in Engineering Science and Mechanics at, Virginia Tech in fall 2019.
17. Ryan Allaire, M.S. Pure and Applied Mathematics, 2013-2015 (co-advising with Bogdan Nita) Thesis title: *Numerical study of 3d flow-structure interaction*, May 1, 2015. Ryan is working on his Ph.D. in Applied Mathematics at the New Jersey Institute of Technology since fall 2015.
18. Joseph Fiordilino, M.S. in Pure and Applied Mathematics, May 2014. Thesis title: *On the effects of temperature and pressure on the flow of non-homogeneous fluids*. Joseph completed his Ph.D. in Applied Mathematics from the University of Pittsburgh in Spring 2018 and is employed at the Army Research Lab in San Diego, CA.
19. Andrew Mauro, M.S. in Chemistry, Montclair State University, May 2013. Thesis title: *Modeling protein aggregation in Alzheimer's disease*. Andrew is currently a high school Chemistry teacher at Mount Saint Dominic Academy in Caldwell, NJ.
20. Douglas Platt, M.S. Pure and Applied Mathematics, Montclair State University, May 2010. Thesis title: *Mechanics of the tear film in the eye*. Doug earned his PhD in Mathematics Education at Montclair State University.

#### HONORS STUDENTS (SHIP)

1. Doralia Castillo, Physics (2013-2015). B.S. in Physics. Doralia is now pursuing her PhD in Mechanical Engineering at Cornell University.

2. Pamela Guerron, Honors student, B.S. Physics, (2011-Dec. 2013). Wrote her thesis on *Equilibrium configurations of flexible fibers in a flow*. Pam will begin her Ph.D. in Mathematics at the University of Pittsburgh starting the fall 2015.
3. Wayne Ernst (SHIP, 2010-2013), Honors student, B.S. Physics. Wrote his thesis on *Nonequilibrium pattern formation on discrete graphs*. Wayne works as a Physics teacher in the Clifton school district.
4. Michael Cohrs, Honors student, B.S. Physics, May 2012. Wrote his Honors thesis on *Potential for energy harvest from vortex induced oscillations*. Michael is currently employed at *Fluid Imaging Technologies*, NJ.

#### UNDERGRADUATE RESEARCH STUDENTS

1. Megan Akdemir, 2023-2024, BS Math Education. Topic: Mathematical Modeling in Education.
2. Stephanie Smith, 2023-2024, BS Math Education. Topic: Mathematical Modeling in Education.
3. Kaitlyn Cohan, September 2023-May 2024. BS-Math. Network Modeling of Soccer.
4. Cristina Flores, Spring 2022 . BS (Math). Network modeling of educational networks.
5. Erick Tapia, Spring 2023. BS(Math)&BS(Computer Science). Semantic networks in climate change education.

#### OTHER

*(Students at Montclair State University who spent between one semester to two years working with me)*

1. Danny Barry, Math, (Jan 2011- May 2012). Danny is currently employed as a manager at Unique Photo store in Fairfield, NJ.
2. Jillian Varner, Physics, (Sept. 2011- Dec.2013).Jill co-authored one paper with me. *Jillian completed her masters degree in physics education under the Woodrow Wilson fellowship*.
3. Paul McLaughlin (2009,2010), B.S. Physics, Montclair State University. Worked on experimental study to understand the transport phenomena induced by an oscillatory shear flow.
4. John Park, B.S. in Physics(Sept 2011-May 2012). Worked on experiments on fluid flow in the eye. John is working towards his doctorate in mathematics education at MSU.
5. Gin Sanchez, Ph.D. candidate in Department of Environmental Sciences (2009-2011)
6. Abelardo Romero, M.S. in Pure and Applied Mathematics (Jan 2011-May 2012).
7. Leo Hentscker, Montclair High School Student (Jan 2014-June 2014). *Leo is currently pursuing his undergraduate degree in Physics at Harvard University starting the fall of 2014*. Leo is a co-author on a paper with me (see publication list above).
8. Sue-Anne Alonso, Biology, (Sept. 2013- May 2014). *Sue-Anne is pursuing her masters in biology education under the Woodrow Wilson fellowship*.
9. Luis Quinones, Biology (Sept. 2013 – May 2014, co-advised with Professor Dirk Vanderklein)
10. William Hernandez, Physics, (2012-2014)
11. Raymond Burns, Physics (2012-2014)
12. Siobhan Soltau, Physics, (2012-2015). Siobhan co-authored two papers with me (see publication list above).
13. Karina Soriano, Physics, (2013-2015). Karina co-authored one paper with me (see publication list above).

14. Matt Cristaldi, Physics, (2014-2016). Matt is currently working on his Master's degree in sustainability science at Montclair State University. As of May 2016, Matt also works as a Demand Response Analyst for Direct Energy in Iselin, NJ.
15. Kevin Johansmeyer, Physics (2015-2016)
16. Albert Jarvis, Physics (2015-2016)
17. Matt Karlsson, Physics (2015-2016). Worked on *Development of primary vortex pattern in flow past a cylinder*.
18. John Starner, Physics (2016-2017).
19. Ciere Monahan, Ph.D. candidate in Mathematics Education (2016 – current).
20. Samuel Hall, Physics (2016-2017)
21. Christopher Dahdouh, Computer Science and Physics (2016 – 2017)
22. Michelle Castillo, Physics (2016-2017)
23. Thomson Kneeland, B.S. in Pure and Applied Mathematics, (2018 – 2019).
24. Elinor Behlman, Montclair High School, summer 2020, 2021.
25. Riya Jain, School of Science and Technology, Rockaway, Summer 2021.
26. Blake Kessler, Kinnelon High School Student, summer 2021.
27. Jim Stanton, BS (Mathematics Education), summer 2021.
28. Gabriella Vidal, Fall 2021, B.S. Math Education, Topic: Network analysis of education.
29. Kevin Vargas, Fall 2022-2023. B.S. Physics. Vortex induced vibrations of hinged cylinders.
30. Vlad Nita, January 2022 – continuing. BS (Math & Computer science). Modeling of educational networks.

## THESIS COMMITTEES

### MASTERS THESIS COMMITTEES – MSU

1. Holly Timme, M.S. in Pure and Applied Mathematics, graduated August 2012.
2. Alex Cali, M.S. in Pure and Applied Mathematics, graduated August 2014.
3. Kofi James, M.S. in Mathematics with concentration in education, graduated August 2014.
4. Jeff Schwarz, M.S. in Pure and Applied Mathematics, graduated April 2015.
5. Kyle Fitzsimmons, M.S. in Pure and Applied Mathematics, graduated August 2016.
6. Klodiana Shkembi, M.S. in Pure and Applied Mathematics graduated October 2016.
7. Tevin Rouse, M.S. in Pure and Applied Mathematics (May 2017)
8. Lucia Cataldo-Ottieri, M.S. in Pure and Applied Mathematics (May 2017)
9. Alexa Aucoin, M.S. in Pure and Applied Mathematics (April 2018)
10. Albert Jarvis, M.S. in Pure and Applied Mathematics (June 2018)
11. Reza Arjmandi Asl, M.S. Pure and Applied Mathematics, Montclair State University, May 2020.
12. Nicholas Jefopoulos, MS in Applied Mathematics, June 2021.
13. Sarah Acquitiva, MS. In Mathematics, May 2023.
14. Frankie Mennicucci, MS in Mathematics, May 2024.

**PHD THESIS COMMITTEES – MSU and Other Institutions**

1. Ciere Monahan, Ph.D. candidate in Mathematics Education, Montclair State University (2016 – 2021).
2. External Committee Member/Secondary Thesis Advisor, Joseph Pateras, Ph.D. student at the Department of Computer Science, Virginia Commonwealth University, Richmond, VA, September 2020 - continuing,

**OTHER**

1. Americorps Fellowship Supervisor for Erick Tapia (Undergrad math major), February-June 2023.
2. Americorps Fellowship Supervisor for Ursula Darios (PhD student in math education), June-August 2023.
3. Mentored several undergraduate students in different experimental research projects at the Fluid Dynamics Laboratory, Department of Mathematics, University of North Carolina, Chapel Hill between 2006 and 2009:
  - Philip Howard (Mathematics)
  - Greg Gipson (Chemistry)
  - Dennis Spronk (Mathematics)
  - Angele Freeman (Mathematics)
  - Vivek Menon (Mathematics)
  - David Skewrer (Computer Science)
  - Sean Skewrer (Computer Science)
  - Monica Kim (Mathematics)
4. Supervised an independent study project course for two students titled 'Fluid- Structure Interaction' at the Department of Mathematics, Florida State University, Spring 2006:
  - Timothy Gould (Mechanical Engineering)
  - Kevin Meyers (Chemical Engineering)
5. Served as Co-Advisor for Mechanical Engineering final project course (ME1043) at University of Pittsburgh for spring 2002, summer 2002, fall 2002, spring 2003, summer 2003, fall 2003 and spring 2004 terms.

**AWARDS WON BY STUDENTS**

- Ryan Allaire:
  - Best outgoing Masters student award from the College of Math and Science, MSU, 2015.
- Karina Soriano and Doralia Castillo, poster award at the LSAMP Garden State Conference, fall 2014.
- Doralia Castillo
  - Ben Minor award for best upcoming Physics student at MSU in 2015.
- Pam Guerron:
  - K. Leroy Irviss Fellowship, University of Pittsburgh
  - Richard Hodson award for best graduating Physics student in 2014;
  - Best poster award at APS DFD 2013 meeting.
- Joseph Fiordilino:

- Best outgoing Masters student award from the College of Math and Science, MSU, 2014
    - Best Poster Award APS DFD 2013.
    - Department of Defense SMART scholarship award for 5 years, May 2014.
  - Jillian Varner:
    - Woodrow Wilson Fellowship for Masters degree in physics education 2014.
  - Sueanne Alonso:
    - Woodrow Wilson Fellowship for Masters degree in biology education 2014.
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## COMMUNITY OUTREACH ACTIVITIES

- Lake Greenwood Project. Conducted a collaborative project with colleagues and students in Math (Calculus I), Environmental Science, Biology and Anthropology with the Lake Green Community, NJ on the algae bloom issue in the lakes. Fall 2019.
  - Faculty Fellow, Center for Community Engagement, Montclair State University, 2018-2020.
  - Visiting scientist lecture at St. Francis School, April 21, 2016
  - Visiting scientist lecture at Middlesex Middle School, January 28, 2016.
  - Conducted science training workshops activities for two Clifton High Schools students, summer 2015.
  - Co-organizer of Physics and Art photo exhibition at Montclair, Clifton and Kearney public libraries.
  - Presented a lecture titled 'Art and Science' at the Sneak Peek pre-show for the dance performance 'Atomos' by the Random Dance Company, Kasser Auditorium, NJ, March 2014.
  - Presented a lecture-performance titled 'Creativity in Science' at the Showcase for Teaching and Learning, Montclair State University, May 2013.
  - Won the APS Mini Outreach grant in 2012.
  - Participated as a provocateur in 'A Matter of Origins' a dance performance by Liz Lerman, April 2011, Kasser Auditorium, NJ.
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## PROFESSIONAL MEMBERSHIPS / SERVICE

### *Significant Service to Montclair State University, College and Department*

- Advisory Board Member, Interdisciplinary School for Social Transformation, Montclair State University, Fall 2025-present.
- Auxiliary Chair, Department of Mathematical Sciences, 2016-2017.
- Chair of the Department Personnel Action Committee, 2018-2019, 2016-2017.

- Member of the Department Personnel Action Committee (DPAC), 2014-2016.
- Chair of Physics Group in the Department of Mathematical Sciences, MSU, 2014-2016.
- CSAM faculty representative for the MSU Student Research Symposium, April 2012-2014.
- Member of CASM Lab Safety Committee, 2009-2015.
- Organizing Committee for the campus wide “Creative Thinking” course, 2011-present.
- Member of Development Committee for the CSAM Science Honors Innovation Program, 2010.
- Member of CSAM Honors Program Committee, 2014-2017.
- Organizer of the department seminars at the Department of Mathematical Sciences, 2010-2014.
- Department of Mathematical Sciences, new course development committee 2013-2014.
- Helped put together the combined B.S./M.S. program in Physics and Applied Mathematics, 2012.
- Developed Combined B.S./M.S. 3+2 program between MSU and Steven Institute of Technology, 2015-2017. Now serving as the departmental coordinator the 3+2 joint program.
- Member of the Math Department Graduate Committee Spring 2017 - 2019.
- Member of six faculty search committees since 2010.
- Member of CSAM development officer search committee, 2015.
- Member of Departmental Adjunct Committee, Fall 2016 onwards.
- Member of Advisory Board, P.S.E.G. Institute for Sustainable Studies, CSAM, MSU 2015-continuing.
- Member of Department Budget Committee, 2015-2017.
- Department coordinator for CSAM/University based events such as CSAM Discovery Day, 2015-2017.
- Member of Department Steering Committee, 2015-2016.
- Member of Department By-Laws Committee, 2015-2016.
- Worked on developing new joint programs between Department of Mathematical Sciences and School of Business.

*Professional Society Memberships Past and Present*

- Complex Systems Society
- American Mathematical Society
- Society for Engineering Science
- American Physical Society
- Biophysical Society
- Union of Concerned Scientists
- Tear Film & Ocular Surface Society

- Institute for General Semantics

#### *Professional Service*

- External Reviewer, Department of Mathematics, Felician University, May 24<sup>th</sup>, 2022.
- Topics Editorial Board Member for Entropy (MDPI).
  - Edited special issue “Entropy and Organization in Natural and Social Systems”, August 2020.  
[https://www.mdpi.com/journal/entropy/special\\_issues/Natural\\_Social](https://www.mdpi.com/journal/entropy/special_issues/Natural_Social)
- Member of International Advisory Committee, International Conference on Recent Advances in Mechanical Engineering & Material Science (ICAMEMS-22), January 2022.
- Scientific Committee Member for the 7<sup>th</sup> International Conference on Computational Data Analysis and Numerical Methods, September 2020, Tomar, Portugal.
- Session Chair, Thermodynamics 2.0, International Association of Integration of Science and Engineering (IAISAE), Boston, MA, June 24-27, 2020.
- NSF Division of Physics, Reviewer, March 2021.
- NSF IUSE Program, Panelist/Reviewer, April 2020
- External reviewer for US Army grant proposal in Fluid Mechanics, January 2020.
- Editorial Board Member, *Fluids* (MDPI), December 2018 – present.
  - Co-editor of special issue (with Mehrdad Massoudi) titled “Mechanics of Fluid-Particles Systems and Fluid-Structure Interactions”, *Fluids*, 2016/2017.
  - Edited special issue titled “Teaching and Learning of Fluid Mechanics”, *Fluids*, 2019.
  - Edited special issue titled “Teaching and Learning of Fluid Mechanics-Volume II”, *Fluids*, 2020.
- Associate Editor for *Applied Mathematics and Computation* (Elsevier), September 2011 –present.  
 (http://www.journals.elsevier.com/applied-mathematics-and-computation/editorial-board)
- Associate editor for *International Journal of Applied Mathematics and Statistics* (CESER Publications), 2005-2010.
- Scientific Committee Member for the 4<sup>th</sup> International Conference on Computational Data Analysis and Numerical Methods, October 2017, Beja Polytechnical Institute, Portugal.
- Organizing Committee Member for NERCCS 2019: Second Northeast Regional Conference on Complex Systems.
- Served as reviewer for John Wiley and Sons, 07-2018.
- Reviewer for
  - *Acta Biotheoretica* (Springer)
  - *Advances in Mathematical Physics*(Hindawi)
  - *Applicable Analysis*(Taylor & Francis)
  - *Applied Mathematics and Computation*(Elsevier)
  - *BMC Pharmacology and Toxicology*(BioMed Central)



- *Boundary Value Problems (Springer)*
- *Bulletin of the NJ Academy of Science*
- *Computers and Mathematics with Applications(Elsevier)*
- *Energies (MDPI)*
- *European Journal of Mechanics B (Elsevier)*
- *Fluids (MDPI)*
- *Fractal-Fract(MDPI)*
- *International Journal of Applied Mathematics and Statistics(CESER)*
- *Journal of Applied Fluid Mechanics*
- *Journal of Computational Methods in Sciences and Engineering*
- *Journal of Engineering Mathematics(Springer)*
- *Journal of Industrial and Engineering Chemistry Research(ACS)*
- *Journal of Mathematical Analysis and Applications(Elsevier)*
- *Korea-Australia Rheology Journal (Springer)*
- *Mathematical Biosciences(Elsevier)*
- *Mathematical Methods in Applied Sciences (World Scientific)*
- *Mathematical Problems in Engineering(Hindawi)*
- *Mathematical Reviews,*
- *Powder Technology(Elsevier)*
- *PRIMUS(Taylor & Francis)*

#### Other

- Co-Editor of Buhl Planetarium (Pittsburgh, PA) Quarterly Newsletter (1995-1999).

#### AWARDS/FELLOWSHIP

- Sitaramayya Memorial Award in Physics, University of Madras, India, 1992.
- Chancellors Undergraduate Research Fellowship, University Honors College, University of Pittsburgh, 1994.
- Halliday-Resnick Award, Dept. of Physics & Astronomy, University of Pittsburgh, 1994.
- REU award, American Astronomical Society, 1994
- National Honor Physics Society, 1995
- Second Place at Engineering Graduate Student Poster Fair, University of Pittsburgh, 2001.