Curriculum Vitae

King-Yeung Lam (Adrian)

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Year of Birth: 1985 (Hong Kong)
Date of CV: March 21, 2025

Apppointment

2020 – Associate Professor of Mathematics, Ohio State University
2014 – 2020 Assistant Professor of Mathematics, Ohio State University
2012 – 2014 Croucher Foundation Postdoc Fellow, Mathematical Biosciences Institute
2011 – 2012 Zassenhaus Assistant Professor, Ohio State University

Education

2011 Ph.D. University of Minnesota, Mathematics (advisor: Wei-Ming Ni)
2006 B.Sc. The Chinese University of Hong Kong, Mathematics (with Honors)

Editorial Activities

2024 – Associate Editor, SIAM Journal on Applied Mathematics (SIAP)
2025 – Associate Editor, SIAM Journal on the Life Sciences (SIALS)
2022 – Associate Editor, Journal of Mathematical Biology (JOMB)
2020 – Associate Editor, Discrete and Continuous Dynamical Systems Series B (DCDS-B)
2019 – Associate Editor, Mathematics in Applied Sciences and Engineering (MASE)

Scientific/Academic honors, grants

2025 Jun Invited lecturer at CIMPA School, "Mathematical Models in Biology and Related Applications of PDEs"
2023, 2024 Stanford/Elsevier List of Top 2% Scientists.
2024 - 2027 HK-RGC Grant 15305824 "Analysis of the Cross-diffusion Systems: New Results and Applications" (co-PI) (3 years)
2023 - 2026 NSF Collaborative Grant DMS-2325195 "Mechanistic models for seasonal avian migration" (lead-PI) (3 years)
2022 Apr-Jun Visiting professor, Institut Henri Poincaré and Lab. J.-L. Lions, Sorbonné Université
2022 Jan-Mar Invited lecturer at Institut Henri Poincaré
2019 – 2023 NSF Grant DMS-1853561 "Dynamics of Phytoplankton in Water Columns: Persistence, Competition and Evolution" (lead-PI) (3 years)
2014 – 2017 NSF Grant DMS-1411476 "Evolutionarily Stable Dispersal Strategies in Spatial Models" (as co-PI) (3 years), PI: Yuan Lou (OSU Math)
2012 Croucher Overseas Postdoctoral Fellowship, Croucher Foundation. (2 years)
2002 1st runner-up, Hong Kong Physics Olympiad.

Academic Visits

2025 May Paris Dauphine Université
2023 Nov National Center for Theoretical Sciences, National Taiwan University
2022 Summer Laboratoire Jacques-Louis Lions, Sorbonne Université, Paris.
2022 Spring Lecturer, Trimester on "Mathematical Modeling of Organization in Living Matters", Institut Henri Poincarè, Paris.
2018 Jul. Laboratoire Jacques-Louis Lions, Paris-VI, Paris, France
2015/17/18 Institute for Mathematical Sciences, Renmin University, Beijing, China
2015 May. National Center for Theoretical Sciences, National Tsing-Hua University
2014 Dec. University of Ottawa
2013 Jun. Center for Partial Differential Equations, East China Normal University
2014 Nov. University of Minnesota
2012 Aug. Centre for Mathematical Biology, University of Oxford

Research interests

Partial differential equations, free-boundary problems, evolutionary game theory, biology

Research

Publications

Books, expository articles, and edited volumes

2024 5. MiKenna Dew, Amanda Langosch and Theadora Baker-Wallerstein, Modeling an infection outbreak with quarantine: The SIBKR Model, Rose-Hulman Undergraduate Mathematics Journal, 2024, accepted. (Supervisor on the project.)

2024 4. (Article on teaching) K.-Y. Lam, Getting Your Hands Dirty: Teaching Math Biology with Active Learning Strategies. Early Career Section, Bull. Amer. Math. Soc., Vol. 41, No. 4, April 2024, pp. 10-12.

2022 3. (**Monograph**) K.-Y. Lam and Y. Lou, Introduction to Reaction-Diffusion Equations: Theory and Applications to Spatial Ecology and Evolutionary Biology. Lecture Notes on Mathematical Modelling in the Life Sciences, Springer Cham, **312pp.**

2020 2. K.-Y. Lam, S. Liu, and Y. Lou, Selected topics on reaction-diffusion-advection models from spatial ecology. Math. Appl. Sci. Eng., available online (open access), 31pp. (DOI 10.5206/mase/10644).

2019 1. K.-Y. Lam and Y. Lou, Persistence, Competition and Evolution, The Dynamics of Biological Systems, A. Bianchi, T. Hillen, M. Lewis, Y. Yi eds., Springer Verlag. (Part of the Mathematics of Planet Earth book series (MPE, volume 4)) DOI: 10.1007/978-3-030-22583-4_8.

Submitted

5. (with Jiawei Chu, Boyu Wang and Tong Wang) An optimal switching approach for bird migration, 25pp.
4. (with H. Jin, Z.-A. Wang) Global dynamics of the toxicant-taxis model with Robin boundary conditions, 35pp.
3. (with G. Nadin and X. Yu) Asymptotic spreading in heterogeneous environment II: flux-limited junction conditions. 41pp. https://arxiv.org/pdf/2410.14007
2. (with D. Tang and Z.-A. Wang) Competition model with density-dependent diffusion. 29pp. (submitted)
1. (with R.S. Cantrell, C. Cosner and I. Mazari) Ideal free distribution via mean field games approach.

In preparation

2. (with I. Mazari) On mean field games of branching processes.
1. (with C.-H. Wu) On the fine propagation property in shifting environments.

Peer-reviewed research articles

2025 60. Baragary, Ashley; Wang, Lin; Lam, Adrian; Ali, Arwa; Belden, Jason; Collins, Kevin; Zhang, Bo, Determining the optimal movement strategies in environments with heterogeneously distributed resource and toxicant, OIKOS, accepted (2025).

59. C. Henderson and K.-Y. Lam, A Hamilton-Jacobi approach to road-field reaction-diffusion models, J. Math. Pures Appl., accepted (2025), 72pp.

2024 58. J. Jacobs, Y. Salmaniw, K.-Y. Lam, L. Zhai, H Wang and B. Zhang, Fundamental principles of the effect of habitat fragmentation on species with different movement rates, Conservation Biology, (2024), accepted. doi:10.1111/cobi.14424

57. L. Wang, K.-Y. Lam, B. Zhang, On the principal eigenvalue of cooperative elliptic systems with applications to a population model with two reversible states, Disc. Contin. Dyn. Syst. Ser. B, (2024), accepted. doi:10.3934/dcdsb.2024166

56. K.-Y. Lam, X.-Q. Zhao and M. Zhu, Global dynamics of reaction-diffusion systems with a time-varying domain, SIAM J. Appl. Math., 84 no. 4 (2024), pp. 1742-1765. doi:10.1137/23M1582990

55. Qing Li, Xinfu Chen, K.-Y. Lam and Yaping Wu, Propagation phenomena for a nonlocal reaction-diffusion model with bounded phenotypic traits, accepted, J. Differential Equations, 411 (2024) pp. 794-822. doi:10.1016/j.jde.2024.08.032
54. K.-Y. Lam and Ray Lee, The asymptotic spreading of a predator-prey model in a shifting habitat, Math. Appl. Sci. Eng. Vol. 5 No. 3 (2024), pp. 185-275. DOI:10.5206/mase/18029
53. K.-Y. Lam, R. Lee and Y. Lou, *Population Dynamics in an Advective Environments*, Commun. Appl. Math. Comput., 6, 399–430 (2024)
52. K.-Y. Lam and Y. Lou, *The principal Floquet bundle and the dynamics of fast diffusing communities*, Tran. Amer. Math. Soc., 377 (2024), 1-29.

2023 51. D. Gomez, K.-Y. Lam and Y. Mori, *Front Propagation in the Shadow Wave-Pinning Model*, J. Math. Biol., 86 (2023), 72.
50. K.-Y. Lam, Y. Lou and S. Ma, *Exploring the evolutionary dynamics of infectious diseases through SIS epidemic models*, Comm. Info. Syst., 23 (2023), 289–324.
49. C. Heggerud, K.-Y. Lam and H. Wang, *Niche differentiation in the light spectrum promotes coexistence of phytoplankton species: a spatial modelling approach*, J. Math. Biol. 86 (2023), 54.

2022 48. K.-Y. Lam, Y. Lou and B. Perthame, *A Hamilton-Jacobi Approach to Evolution of Dispersal*, Comm. Partial Diff. Eqn., 48 (1), 86–118.
47. K.-Y. Lam and X. Yu, *Asymptotic spreading of KPP reactive fronts in heterogeneous shifting environments*, J. Math. Pures Appl., 167 (2022) 1-47.
46. A. Friedman, W. Hao and K.-Y. Lam, *A cancer model with nonlocal free boundary dynamics*, J. Math. Biol. Vol. 85, Article number: 46 (2022), 28pp.
45. B. Zhang, K.-Y. Lam, W.-M. Ni, K. M. Collins, Z. Fu, L. Zhai, Y. Lou, D.L. DeAngelis and A. Hastings, *Directed Movement Promote Species Coexistence*, Ecol. Lett. 25 (2022) 366-377.

2021 44. S. Liu, Q. Liu and K.-Y. Lam, *Asymptotic spreading of interacting species with multiple fronts II: Exponentially decaying initial data*, J. Differential Equations, 303 (2021) 407-455.
43. R.S. Cantrell and K.-Y. Lam, *On the evolution of slow dispersal in multi-species communities*, SIAM J. Math. Anal., 53 (2021) 4933–4964.
42. H. Jiang, K.-Y. Lam and Y. Lou, *Three-patch models for the evolution of dispersal in advective environments: varying drift and network topology*, Bull. Math. Biol. (2021) 83:109, 46pp.
41. A. Friedman and K.-Y. Lam, *Analysis of a mathematical model of innate immune response to fungal infection*, J. Math. Biol. 83, 8 (2021).
40. D. Jiang, Y. Lou and K.-Y. Lam, *Competitive exclusion in a nonlocal reaction-diffusion-advection model of phytoplankton populations*, Nonlinear Anal. Real World Appl., 61 (2021), 103350, 15pp.
39. R.S. Cantrell, C. Cosner and K.-Y. Lam, *Ideal Free Dispersal under General Spatial heterogeneity and Time Periodicity*, SIAM J. Appl. Math., 81 (2021) 789-813.
38. Q. Liu, S. Liu and K.-Y. Lam, *Stacked invasion waves in a competition-diffusion model with three species*, J. Differential Equations, 271 (2021) 665-718.
37. R.S. Cantrell and K.-Y. Lam, *Competitive exclusion in phytoplankton communities in a eutrophic water column*, Discrete Contin.Dyn. Syst. Ser. B, 61 (2021) 103350, 15pp.
36. W. Hao, K.-Y. Lam and Y. Lou,*Ecological and Evolutionary Dynamics in Advective Environments: Critical Domain Size and Boundary Conditions*, Discrete Contin. Dyn. Syst. Ser. B, 26 (2021), 367-400.

2020 35. H. Jiang, K.-Y. Lam and Y. Lou, *Are two-patch models sufficient? The evolution of dispersal and topology of river network modules*, Bull. Math. Biol., 82, Article number: 131 (2020) 34pp.

34. V. Calvez and K.-Y. Lam, *Uniqueness of the viscosity solution of a constrained Hamilton-Jacobi equation*, Cal. Var. PDE, 59, Article number: 163 (2020) 22pp.
33. K.-Y. Lam R. Salako, and Q. Wu, *Entire solutions of the diffusive Lotka-Volterra competition model.* J. Differential Equations, 269 (2020) 10758-10791. DOI: 10.1016/j.jde.2020.07.006.
32. A. Friedman and K.-Y. Lam, *Analysis of a mathematical model of rheumatoid arthritis*, J. Math. Biol., 80 (2020) 1857-1883. (DOI 10.1007/s00285-020-01482-1).
31. Q. Liu, S. Liu and K.-Y. Lam, *Asymptotic spreading of interacting species with multiple fronts I: A geometric optics approach*, Discrete Contin. Dyn. Syst. Ser. A, 40 (2020) 3683-3714. (DOI 10.3934/dcds.2020050).

2019 30. L. Girardin and K.-Y. Lam, *Invasion of open space by two competitors: spreading properties of monostable two-species competition-diffusion systems*, Proc. Lond. Math. Soc., 119 (2019), 1279-1335.

(**Top Downloaded Paper 2018-19 in the London Mathematical Society)**

29. D. Jiang, Y. Lou K.-Y. Lam and Z. Wang, *Monotonicity and global dynamics of a nonlocal two-species phytoplankton model*, SIAM J. Appl. Math., 79 (2019), 716-742.
28. W. Hao, K.-Y. Lam and Y. Lou, *Concentration phenomena in an integro-PDE model for evolution of conditional dispersal*, Indiana Univ. Math. J., 68 (2019), 881-923.
27. L. Su, K.-Y. Lam and R. Bürger, *Two-locus clines maintained by diffusion and recombination in a heterogeneous environment,* J. Differential Equations, 266 (2019), 7909-7947.
26. X. He, K.-Y. Lam, Y. Lou and W.-M. Ni, *Dynamics of a Consumer-Resource Reaction-Diffusion Model*, J. Math. Biol., 78 (2019), 1605-1636.
25. K.-Y. Lam, *Dirac-concentrations in an Integro-pde Model from Evolutionary Game Theory*, Discrete Cont. Dyn. Syst. Ser. B, 24 (2019), 737-754.

2018 24. K.-Y. Lam, X. Wang and T. Zhang, *Traveling waves for a class of diffusive disease-transmission models with network structures*, SIAM J. Math. Anal., 50 (2018), 5719-5748.

2017 23. R. S. Cantrell, C. Cosner and K.-Y. Lam, *On resident-invader dynamics in infinite dimensional dynamical systems,* J. Differential Equations, 263 (2017), 4565-4616.
22. H.-B. Hsu, K.-Y. Lam and F.-B. Wang, *Single species growth consuming inorganic carbon with internal storage in the unstirred chemostat.* J. Math. Biol., 75 (2017), 1775-1825.
21. K.-Y. Lam, *Stability of Dirac Concentrations in an Integro-PDE Model for Evolution of Dispersal*, Cal. Var. PDE, (2017) 56: 79.
20. R. Cui, K.-Y. Lam and Y. Lou, *Dynamics and Asymptotic Profiles of Steady States of an Epidemic Model in Advective Environments*, J. Differential Equations, 263 (2017), 2343-2373.
19. M. Golubitsky, W. Hao, K.-Y. Lam and Y. Lou, *Dimorphism by singularity theory in a model for river ecology*, Bull. Math. Biol., 79 (2017), 1051-1069.
18. R.S. Cantrell, X. Cao, K.-Y. Lam and T. Xiang, *A PDE model of intraguild predation with cross-diffusion*, Discrete Contin. Dyn. Syst. Ser. B, 22 (2017), 3653-3661. (DOI 10.3934/dcdsb.2017145)
17. K.-Y. Lam and Y. Lou, *An integro-PDE model for evolution of random dispersal*, J. Funct. Anal., 272 (2017), 1755-1790. [DOI 10.1016/j.jfa.2016.11.017]
16. Isabel Averill, and King-Yeung Lam and Yuan Lou, *The role of advection on two competing species: A bifurcation approach*, **Mem. Amer. Math. Soc.**, Vol. 245 (2017) Number 1161, **109p.** [DOI 10.1090/memo/1161]

2016 15. King-Yeung Lam, Yuan Lou and Frithjof Lutscher, *The emergence of range limits in advective environments*, SIAM J. Appl. Math., 76 (2016), 641-662.
14. K.-Y. Lam and Y. Lou, *Asymptotic behavior of the principal eigenvalue for cooperative elliptic systems and applications*, J. Dynam. Differential Equations, 28 (2016), 29-48.

13. Dan Munther and King-Yeung Lam, *A Remark on the Global Dynamics of Competitive Systems on Ordered Banach Spaces*, Proc. Amer. Math. Soc., 144 (2016), 1153-1159.

2015 12. Avner Friedman and King-Yeung Lam, *Analysis of a free-boundary tumor model with angiogenesis*, J. Differential Equations, 259 (2015), 7636-7661.

2014 11. King-Yeung Lam, Yuan Lou and Frithjof Lutscher, *Evolution of dispersal in closed advective environments*, J. Biol. Dyn., 9 Suppl. 1 (2014), 188-212.

10. Wei-Ming Ni and King-Yeung Lam, *Advection-mediated competition in general environments*, J. Differential Equations, 257 (2014), 3466-3500.

9. Avner Friedman and King-Yeung Lam, *On the stability of steady states in a model of granuloma*, J. Differential Equations 256 (2014), 3743-3769.

8. Dan Munther and King-Yeung Lam, *Invading the ideal free distribution*, Discrete Contin. Dyn. Syst. Ser. B 19 (2014), 3219-3244.

7. K.-Y. Lam and Y. Lou, *Evolutionarily stable and convergent stable strategies in reaction-diffusion models for conditional dispersal*, Bull. Math. Biol., 76 (2014), 261-291.

6. K.-Y. Lam and Y. Lou, *Evolution of conditional dispersal: Evolutionarily stable strategies in spatial models*, J. Math. Biol., 68 (2014), 851-877.

2012 5. King-Yeung Lam,*Limiting Profiles of semilinear elliptic equations with large advection in population dynamics II*, SIAM J. Math. Anal., 44 (2012), 1808-1830.

4. King-Yeung Lam and Wei-Ming Ni, *Uniqueness and complete dynamics of the Lotka-Volterra competition diffusion system*, SIAM J. Appl. Math., 72 (2012), no.6, 1695-1712.

3. (with Xinfu Chen and Yuan Lou) *Dynamics of a reaction-diffusion-advection model for two competing species*, Special Volume on Nonlinear Elliptic and Parabolic Problems, Discrete Contin. Dyn. Syst., 32 (2012).

2011 2. *Concentration phenomena of a semilinear elliptic equation with large advection in an ecological model*, J. Differential Equations 250 (2011), no. 1, 161–181.

2010 1. with Wei-ming Ni *Limiting profiles of semilinear elliptic equations with large advection in population dynamics*, Special Volume in Honor of Louis Nirenberg's 85th Birthday, Discrete Contin. Dyn. Syst. 28 (2010), no. 3, 1051–1067.

Invited Talks

Invited Talks (with international audience)

2025 Jul. 3-day Session on Math Biology, Mathematical Congress of the Americas, Miami, FL.
—— Jun. CIMPA school Mathematical models in biology and related applications of partial differential equations, Harvana, Cuba.
2024 Dec. Special Session, AIMS Conference, NYU Abu-Dhabi (cancelled)
—— Dec. Organizer, 5-Day Workshop on Interfacial Dynamics in Life Sciences, IMSI, U. Chicago
—— Nov. Invited talk, Workshop on Differential Equations and Mathematical Biology In honor of Professor Shigui Ruan's 60th Birthday.
—— Oct. Invited talk, Banff International Research Station
—— Jun. Invited talk, HKPolyU-SJTU joint conference on Mathematical Biology – Models and Analysis, (Shanghai portion)
—— Jun. Invited talk, HKPolyU-SJTU joint conference on Mathematical Biology – Models and Analysis, (Hong Kong portion)
—— Jun. Invited talk, Tianyuan International Mathematical Center, Yunnan Province, China.
—— Jun. Invited lecture, Shanghai Jiaotong University, Shanghai, China
2023 Dec. Invited talk, 2023 Winter PDE Workshop, Nankai Univ., China
—— Nov. Invited talk, 2023 NCTS Interdisciplinary Two-Day Workshop: Population Dynamics and Related Topics, NCTS, Taiwan

—— Aug. Mini-Symposia, The 10th International Congress on Industrial and Applied Mathematics, Waseda Univ., Tokyo
—— Aug. Math Biology Workshop, Hong Kong Polytechnic University
—— Jul. 2023 Annual Meeting of the Society of Mathematical Biology, The Ohio State University, Columbus, OH.
—— Jul. Invited Talk, Dynamical Systems in the Life Sciences (Workshop in Honor of 90th Birthday of A. Friedman and 70th Birthday of M. Golubitsky), Columbus, OH.
—— Jun. 2 Special Sessions, 13th AIMS Conference, Wilmington, NC
—— May. Invited main speakers, 87th Midwest PDE Seminar, Notre Dame University, South Bend, IN
2022 Dec. 4 hours lecture, Tianyuan Foundation Lecture Series on Reaction-Diffusion Equations, Shaanxi Univ. Sci. Tech., China, "Maximum principle and the Fisher-KPP equation in shifting habitats", "Principal Floquet bundles and the conjecture of Dockery et al."
—— Mar. Workshop on "Mathematical models in ecology and evolution", Insitut Henri Poincaré, On the problem of Dockery et al. and the evolution of dispersal.
—— Spr. 20-hour lecture on "Reaction-Diffusion Equations and the Evolution of Dispersal", Trimester on "Mathematical Modeling of Organization in Living Matters", Institut Henri Poincaré.
2021 Sep. (virtual) 15th International Conference on Free Boundary Problems, Special Session on "Free Boundary Problems in Life Sciences". A mathematical model of rheumatoid arthritis.
—— Jun. (virtual) Annual SMB Meeting, Mini-Symposium on "The Study of Diffusive Dispersal in Population Dynamics". Defining the Ideal Free Distribution in Spatio-temporally Heterogeneous Environments.
—— May. (virtual) SIAM Dynamical Systems Conference, Session on "Dynamical Systems Approaches for Biological and Cultural Evolution", Population Formulation in Evolution of Dispersal
2020 Dec. (virtual) Conference by Xidian University, China, On the Problem of Spreading of Multiple Competing Species
—— May. (virtual) MBI Workshop, PDEs in Evolution of Dispersal
—— Jan. IMS Workshop, National University of Singapore
2019 Dec. Conference at Guangzhou University, China
—— Jul. Mini-Symposium, SMB Annual Meeting, Montréal, Canada
—— Jun. Workshop at Harbin Normal University, China
—— May. Workshop at Hong Kong Polytechnic University
2018 July. Satellite Meeting for the 2018 ICM, University of Miami
—— July. Mini-Conference at Hong Kong Polytechnic University
—— Jul. Special Session, 12th AIMS Conference, Taipei, Taiwan (Organizer)
—— Jul. Conference at Laboratoire Jacques-Louis Lions, Jussieu Campus, Paris, France
—— Jun. Conference at Lanzhou Unviersity, China
—— Jun. Conference at Shannxi Normal University, Xi'an, China
2016 Aug. BIRS-CMO Workshop 16w5113 Oaxaca, Mexico
—— Jul. Special Sessions, 11th AIMS Conference, Orlando, FL (organizer)
2015 Oct. ICMA-V Conference at Western University, London, Ontario
—— Aug. International Symposium on Application of Nonlinear Partial Differential Equations in Life Science, Tianjin, China,
—— May. International Workshop on Mathematics at the Interface of Life and Natural Sciences, Renmin University, Beijing, China
—— Feb. Workshop on PDEs and Cancer Modeling, BIRS, Banff, Canada
2014 Jul. Workshop on "Dispersal and competition of populations and communities in spatially inhomogeneous environments", Centre Interfacultaire Bernoulli, Lausanne, Switzerland
—— Jul. Special Sessions, 10th AIMS Conference, Madrid, Spain (organizer)

2013 Oct. International Workshop in "New Mathematical Developments Arising from Ecology, Epidemiology and Environmental Science", Beijing International Center for Mathematical Research (BICMR)
—— May. Special Session, The Fourth Conference on Computational and Mathematical Population Dynamics, North University of China, Taiyuan, China,
—— May. Workshop on "Nonlinear Equations in Population Biology", Center for PDE, East China Normal University, Shanghai, China
2012 Dec. Everything Disperses to Miami: Workshop to celebrate Chris Cosner's 60th Birthday, University of Miami, Miami, FL
—— Jul. Special Sessions at 9th AIMS Conference, Orlando, FL (Organizer)
—— May MBI Workshop, PDE vs ODE Dynamics
2010 Dec. Workshop at National Center for Theoretical Sciences, Taiwan, Directed Movements in Population Dynamics

Invited Talks (with domestic audience)

2024 Mar. Midwest Math Biology Seminar
—— Feb. PDE Seminar, Purdue Unviersity
2024 Aug. Invited talk, Mathematical Biosciences Workshop, Pennsylvania State Unviersity (canceled)
—— Jun. Invited lecture, Shanghai Jiaotong University, Shanghai, China
2023 Nov. PDE Seminar, National Taiwan University.
—— Nov. Mathematical Biology Seminar, National Center for Theoretical Sciences, Taiwan.
—— Oct. Colloquium, University of Manitoba.
—— Sep. Colloquium, University of Cincinnati.
—— Apr. (virtual) Math Biology Seminar, UNC Greensboro
—— Apr. (virtual) PDE Seminar, Shanghai Jiaotong University
—— Apr. (virtual) AMS Sectional Meeting
—— Mar. Invited talk, 2023 Shanks Workshop on Advances in Mathematical and Theoretical Biology (declined)
—— Jan. Joint Mathematics Meeting, Boston
2022 Dec. Special session on "Mathematical modeling and analysis in spatial ecology and epidemiology", Canadian Mathematical Society 2022 Winter meeting.
—— Sep. (virtual) Invited Lecture (6 hours), Shanghai Normal University, China.
—— Sep. (virtual) PDE Seminar, Harbin Normal University, China.
—— Jun. Seminar du Lab. J.-L. Lions, Sorbonne Université, Paris.
—— Jun. (virtual) PDE Seminar, Sun Yat-Sen University, Zhuhai.
—— May Colloquium, Univ. Bordeaux.
—— Apr. (virtual) Seminar on Mathematical Biology, National Center for Theoretical Sciences, Taiwan.
2021 Dec. (Virtual) 6-hour lecture, Center for Applied Mathematics, Guangzhou University, "Introduction to Krein-Rutman Theorem and Monotone Dynamical Systems"
—— Dec. (virtual) Special session on "Spatial dynamics of evolution systems in ecology and epidemiology", Canadian Mathematical Society 2021 Winter meeting.
—— Oct. (virtual) Math Biol Seminar, Iowa State, Competition dynamics of phytoplankton species in eutrophic water columns.
—— Oct. (virtual) Comp Biol Seminar, GBCB program, Virginia Tech, Competition dynamics of phytoplankton species in eutrophic water columns.
—— Mar. (virtual) Math Biol Seminar, Center for Math Biology, U. Penn, PDEs in Evolution of Dispersal.
—— Mar. (virtual) Colloquium, University of Manitoba, PDEs in Evolution of Dispersal.
—— Jan. (virtual) PDE Seminar, East China Normal University, PDEs in Evolution of Dispersal.
—— Jan. (virtual) Joint Mathematics Meetings, AMS, Ideal Free Dispersal in Spatio-temporally Heterogeneous Habitats.

2020 Jun. (virtual) Mini-Conference by Shaanxi Normal University, China, On the Problem of Spreading of Three Competing Species
—— Apr. (virtual) PDE seminar, UC Riverside
—— Apr. (virtual) Colloquium, Georgetown University
—— Feb. Math Biol Seminar, University of Alberta
2019 Jun. 4-hour Lecture, Renmin University of China
—— May. (virtual) Mini-Conference by Shanghai Normal University, Mutation-Selection PDE Models
—— May. 6-hour Lecture, South University of Science and Technology, Shenzhen, China
—— May. PDE Seminar, Shanghai Normal University, China
—— May. PDE Seminar, Tongji University, Shanghai, Chin
—— Mar. Mathematical Biology Seminar, Ohio University
—— Feb. PDE Seminar, University of Miami
—— Feb. PDE Seminar, University of Pittsburgh
—— Jan. Special Session, JMM, Baltimore, MD
2018 Jun. PDE Seminar, China University of Science and Technology
—— May. CBMS Conference, Howard University, Washington DC
2017 Sep. Special Session, AMS Sectional, Buffalo, NY
—— Jul. 6-hour Lecture, Institute for Mathematical Sciences, Renmin University, Beijing, China
—— Apr. Colloquium, University of Western Ontario, Canada
—— Apr. Special Session, AMS Sectional, Indiana Univ., Bloomington, IN
2016 Nov. Colloquium, University of Toledo
—— Oct. Mathematical Biology Seminar, Arizona State University
—— May. University of Tennessee Knoxville
2015 May. Mathematical Biology Seminar, National Center for Theoretical Sciences, National Tsing-Hua University, Taiwan
—— Mar. Colloquium, University of Miami,
—— Mar. Special Session, AMS Sectional Meeting, Georgetown University, Washington, DC
2014 Dec. Applied Math Seminar, University of Ottawa, Canada
—— Nov. Special Session, AMS Sectional Meeting, University of North Carolina, Greensboro, NC
—— Jan. Colloquium Talk, Ohio State University
—— Jan. Colloquium Talk, University of Miami
2013 Nov. Colloquium Talk, College of William & Mary, November, 2013.
—— Sep. Applied Math seminar, University of Wisconsin - Milwaukee
—— Aug. MBI WorkshopOhio State University, Columbus, OH
—— Jun. PDE seminar, Donghua University, Shanghai, China
—— Jun. PDE seminar, Tongji University, Shanghai, China
—— Jun. Three hour lecture, Program on Nonlinear Equations in Population Biology, Center for PDE, East China Normal University, Shanghai, China
2012 Oct. Special Session, Sectional Meeting of AMS, Tulane University, New Orleans
—— May. Mathematical Biology Seminar, NCTS, National Tsing-Hua University, Taiwan
—— Mar. Special Session, "Nonlinear Dynamical Systems and Applications", Sectional Meeting of AMS, University of Kansa
—— Feb. PDE seminar, Chinese University of Hong Kong, PDE vs ODE Dynamics
2011 Dec. PDE seminar, Chinese University of Hong Kong, Faster vs Slower Diffusers
—— Nov. PDE seminar, Ohio State University, Faster vs Slower Diffusers
—— Apr. PDE seminar, Ohio State University, Directed Movements in Population Dynamics (Multi-Dimensional Case)
—— Mar. Croucher Advanced Institute, Chinese University of Hong Kong, Hong Kong, Directed Movements in Population Dynamics
2009 Jul. Invited Talk, Elliptic/Parabolic Equations Summer School, East China Normal University, China, Concentration Phenomena of a Semilinear Elliptic Equation with Large Advection in an Ecological Model

Service

Departmental Services

2011-current	Co-organizer, PDE seminar
2014-current	Analysis Exam Committee
2024-2025	Hiring Committee for PDE
	PhD Recruitment Committee
	Undergraduate Advising (Biomath)
2023-2024	Advisory Committee
	VAP Hiring Committee
	PhD Recruitment Committee
	Undergraduate Advising (Biomath)
2022-2023	Advisory Committee
	Faculty Hiring Committee (Applied Math)
	Salary Committee
	Undergraduate Advising (Biomath)
2021-2022	(Sabbatical leave)
2020-2021	Advisory Committee
	Graduate Recruitment Committee
	MRI Board
	Undergraduate Advising (Biomath)
	Undergraduate Honors
2019-2020	MRI Board
2021-2023	VAP mentor (Jiaxin Jin)
2018-2021	VAP mentor (Rachidi Salako)

Professional Service

Conference organization

2025	July.	Co-ogranizer, Special session on dispersal, Mathematical Congress of the Americas, Miami, FL (Jul 21-25, 2025, scheduled)
2024	Dec.	Co-ogranizer, Special session on spectral theory and PDE, 14th AIMS Conference, Abu Dhabi (Dec 16-20, 2024)
2024	Dec.	Co-ogranizer, 5-day Workshop at the Institute for Mathematical and Statistical Innovation, Univ. Chicago (Dec 9-13, 2024)
2024	Oct.	Co-ogranizer, 5-day Workshop on Competition Models in Biology, Banff International Research Station, Canada (Oct. 6-11, 2024)
2024	Apr.	Lead-ogranizer, Midwst PDE Seminar , Ohio State Univ. (April 26-28, 2024)
2023	Aug.	Co-organizer, Mini-Symposium, ICIAM, Waseda Univ., Tokyo, Japan.
2023	Jul.	Local organizer, SMB Annual Meeting, Columbus, OH.
2023	Jul.	Mini-symposium organizer, SMB Annual Meeting, Columbus, OH.
2023	May.	Special session organizer, AIMS Meeting, Wilmington, SC.
2022	Spr.	Lecturer at Institut Henri Poincaré, Trimester on mathematical modeling of organization in living matter.
2021	Dec.	Main organizer, Winter Math Biology Workshop, Columbus, OH.
2020	Aug.	Organizer, Workshop "Life on Planet Earth: Above and below", Mathematical Biosciences Institute, Ohio State University. (Virtual event)
2019	Jul.	Mini-Symposium organizer, Annual Meeting of the Society of Math Biology, Montreal, Canada.
2019	Mar.	Local organizer, AMS Central Sectional Meeting, Columbus, OH.
2018	Jul.	Special session organizer, AIMS Meeting, Taipei, Taiwan.
2016	Jul.	Special session organizer, AIMS Meeting, Orlando, FL.
2014	Jul.	Special session organizer, AIMS Meeting, Madrid, Spain.

Granting agencies refereed

National Science Foundation (NSF) (Panelist; Ad Hoc Reviewer; Graduate Research Fellowship)
Alberta Conservation Association Research Grant Program
National Science Foundation of South Africa
Paris Science et Lettres Young Researchers Starting Grant

Reviewer activities

Reviewed over 60 articles for the following journals

Analysis and PDE
Annales de l'Institut Henri Poincaré C
Applicable Analysis
Applied Mathematics Letters
Bulletin of Mathematical Biology
Calculus of Variations and PDE
Communications in Contemporary Mathematics
Discrete and Continuous Dynamical Systems A
Discrete and Continuous Dynamical Systems B
Discrete and Continuous Dynamical Systems S
Discrete Dynamics in Nature and Society
Journal de l'École polytechnique - Mathématiques
Journal of Applied Analysis and Computation
Journal of European Mathematical Society
Journal of Function Spaces
Journal of Differential Equations
Journal of Dynamics and Differential Equations
Journal of Mathematical Analysis and Applications
Journal of Mathematical Biology
Journal of Algebra
Journal of Mathematical Study
Journal of Nonlinear Sciences and its Applications
Journal of Nonlinear Science
Journal of Theoretical Biology
Mathematical Biosciences
Mathematical Methods in the Applied Sciences
Mathematical Models and Methods in Applied Sciences
Natural Resource Modeling
Nonlinear Analysis: Real World Applications
Nonlinearity
Proceedings of the London Mathematical Society
Proceedings of the National Academy of Sciences
SIAM Journal of Applied Mathematics
SIAM Journal of Mathematical Analysis
Theoretical Population Biology
Transactions of American Mathematical Society
Zeitschrift fur Angewandte Mathmatik und Physik.

Miscellaneous review activities

- External Ph.D. dissertation examinar (for Léo Girardin, student of G. Nadin and V. Calvez, Lab. J. L. Lions, 2018)
- *Math Reviews* reviewer

Teaching

Teaching activities

Curriculum development

2023 Spr. Redesigned the Math 3350 (Introduction to Math Biology) to include additional topics such as stochastic models, parameter estimation, and developed 8 topics for final group research projects. In these projects, students work in groups to engage in mathematical modeling of biological problems and gain hands on experience with using data.

2022 Spr. (Sabbatical) I was invited to deliver a 20-hours mini-course on "Reaction-Diffusion Equations in Biology" at the trimester at Institut Henri Poincaré. The lecture notes was expanded and published under the title "Introduction to Reaction-Diffusion Equations: Theory and Applications to Spatial Ecology and Evolutionary Biology" in the book series "Lecture Notes of Mathematical Modeling in the Life Sciences" with Springer Cham.

Courses taught at Ohio State

2024	Fall	Calculus I (Math 1151) (1 session, over 200 enrollments)
2024	Spring	Introduction to Math Biology (Math 3350)
		Differential equations and their Applications (Math 2255) (two sessions)
2023	Spring	Introduction to Math Biology (Math 3350)
		Differential equations and their Applications (Math 2255)
2022	Fall	Real Analysis I (Math 6211)
2022	Spring	(Sabbatical) 20-hours mini-course on "Reaction-Diffusion Equations in Biology" at the trimester at Institut Henri Poincaré.
2021	Spring	Introduction to Mathematical Biology (Math 3350) (with Avner Friedman)
2020	Fall	Calculus I (Math 1151) (3 sessions, over 500 enrollments)
2020	Spring	Mathematical Modeling of Biological Processes (Math 5651) (with Avner Friedman)
2020	Spring	Introduction to Mathematical Biology (Math 3350) (with Avner Friedman)
2019	Fall	Intro to Real Analysis I (Math 5201)
2019	Spring	ODE and PDE (Math 2415)
		Calculus III (Math 2153) (Ximera)
2018	Fall	Intro to Real Analysis I (Math 5201)
2018	Spring	Differential Equations and their Applications (Math 2255)
2017	Fall	Differential Equations and their Applications (Math 2255) (Two sessions)
2017	Spring	Differential Equations and their Applications (Math 2255)
2016	Fall	PDE for Science and Eng. (Math 4512)
2015	Fall	Intro to Real Analysis I (Math 5201)
		PDE II (Math 7452)
2015	Spring	Intro to Real Analysis II (Math 5202)
2014	Fall	Intro to Real Analysis I (Math 5201)
2012	Spring	Intro to Real Analysis II (Math 5202)
2011	Fall	Intro to Real Analysis I (Math 5201)

Mentoring

- Rachidi Salako (VAP 2018-2021) is now tenure-track AP at Univ. Nevada, Las Vegas
- (Official PhD advising)
  - Ray Lee (2018–2024)
- (Other PhD advising/collaboration)
  - Yurij Salmaniw (PhD Alberta, 2023, now postdoc at University of Oxford)
  - Christopher M. Heggerud (PhD Alberta, 2021, now postdoc at UC Davis)
  - Shizhao Ma (PhD Renmin University of China 2023, now postdoc at Shanghai Jiaotong University)
  - Gabriel Khan (PhD Ohio State, 2018, now AP at Iowa State);
  - Jangho Park (PhD Ohio State, 2019, now AP at the Department of Industrial Engineering, Hongik University, South Korea)
  - Qian Liu (visiting PhD student during 2017-2019, now AP at Shaoyang College, China),
  - Danhua Jiang (visiting PhD student during 2017-2019, now AP at Zhejiang University of Technology, China);
  - Shuang Liu (visiting PhD student during 2018-2020, now AP at Beijing Institute of Technology, China);
  - Leo Girardin (visiting PhD student during 2017 Fall, now CNRS Univ. Lyon)
- (REU Projects)
  (2024 summer) Boyu Wang and Tong Wang;
  (2023 Summer) MiKenna Dew, Amanda Langosch and Theadora Baker-Wallerstein;
  (2022 Summer, co-mentor with Y. Xing) Nimo Ismail, Qianzi Hou, Quanhai Chen, Xin Hui ;
  (2019 Summer) Katherine Pontarelli, Emily Mader;
  (2018 Summer) Le Su, Yi Qin;
  (2016 Spring) Tianran Lu.

Training

The Michael V. Drake Institute for Teaching and Learning

Teaching Practices Inventory (An inventory allows faculty members to reflect on effective practices they currently use and provides a baseline as their teaching practices evolve.)

Reading Reflection (Further self-reflection through exploration of reading recommendations in best teaching practices)