Curriculum Vitae

Name:	Yun Kang
Address:	Science and Mathematics Unit, College of Integrative Sciences and Arts, Arizona State University Polytechnic Campus, AZ 85212, USA.
E-mail :	yun.kang@asu.edu
Web page :	http://www.public.asu.edu/∼ykang3/

Education:

Arizona State University	Mathematics (mathematical biology)	PhD	2008
University of Arizona	Mathematics (random graphs)	M.S.	2004
Shanghai Jiaotong University, China	Financial and Computational Mathematics	B.S.	2002

Affiliation and Employment:

2019–	Professor, Science and Mathematics Faculty, College of Integrative Sciences and Arts, Arizona State University
2016–2019	Acting Director/Co-Director, Simon A Levin Mathematical, Computational & Modeling Sciences Center, Arizona State University
2014–2019	Associate Professor, Science and Mathematics Faculty, College of Integrative Sciences and Arts, Arizona State University
2013–2014	Assistant Professor, Science and Mathematics Faculty, College of Letters and Sciences, Arizona State University
2008–2012	Assistant Professor, Applied Sciences and Mathematics, College of Technology & Innovation, Arizona State University
2008-Present	Core Faculty, Simon A Levin Mathematical, Computational & Modeling Sciences Center, Arizona State University
2008-Present	Affiliated Faculty, School of Mathematical and Statistical Sciences, Arizona State University

Research Interests:

My main areas of study are Complex Adaptive Systems (CAS) and Mathematical Modeling. My research interests have both theoretical and modeling components:

- Nonlinear dynamical systems (ODEs, Difference Equations, PDEs, DDEs, Integro-Difference Equations, and Stochastic Differential Equations).
- Mathematical biology (Population Dynamics, Food-web Structures, Spatial Ecology).
- Modeling in epidemiology, eco-epidemiology, and social insect colonies as CAS.
- Modeling Trust Dynamics and Human-Automation interactions.

I. Research and Scholarly Activities

I.A. Publications/Manuscripts: *Underline* indicates the corresponding author; ^{s} indicates post-doctoral and/or international scholars under my supervising; * indicates graduate student; and ** indicates undergraduate student. Publications involving international research collaborations are indicated with superscript ^{i}. Order of authorship: Students are first authors provided that they carried out the majority of the model develop and the related analysis. The mentor/senior author/s is listed last in general. The 'sandwiched' authors are sorted in descending order based on practical and intellectual contributions to designing and performing experiments, analyzing/providing data, and to developing the publications. My contributions have been provided at the end of each publication.

I.A.1-Published in peer-reviewed international high impact journals:

1. Carlos Bustamante Orellana*, Lucero Rodriguez Rodriguez*, Lixiao Huang, Nancy Cooke, and **Yun Kang**, 2024. Machine Learning for Automation Usage Prediction: Identifying Critical Factors in Driver Decision-Making. Accepted in *Applied Intelligence*.

2. A Sarkar, Y Kang, PK Tiwari, 2024. Exploring the Influence of Refuges and Additional Foods on Predator-Prey Interactions Amidst Environmental Stochasticity and Water Level Fluctuations. Accepted in *International Journal of Biomathematics*.

3. Carlos Bustamante Orellana*, Lucero Rodriguez Rodriguez*, Lixiao Huang, Nancy Cooke, and **Yun Kang**, 2024. Mathematical Modeling of the Dynamics of Trust in Automation. Accepted in *Proc. Hum. Factors Ergon. Soc. Annu. Meet.*

4. AK Misra, S. Pal, and **Y. Kang**, 2024. How can we avoid the extinction of any species naturally? A mathematical model. Accepted in *International Journal of Biomathematics*.

5. O. Aydogmus and **Y. Kang**, 2024. Deterministic approximation of a stochastic imitation dynamics with memory, *Dynamic Games and Applications*. **14** (3), 525-548. https://doi.org/10.1007/s13235-023-00513-y

6. Lucero Rodriguez Rodriguez*, Carlos Bustamante Orellana*, and **Yun Kang**, 2024. Communication dynamics of a two-agent interaction model with applications to human-autonomy teaming, *Journal of Difference Equations and Applications*, 1-31.

7. A Singh, D Tripathi and **Y. Kang**, 2024. A modified May-Holling-Tanner Model: The role of dynamica alternateive resources on species' survival, *Journal of Biological Systems*, **32** (1), 187-218.

8. Jun Chen*, Guo Xiaohui*, Soodeh Azizs, and **Yun Kang**, 2024 Dynamics of social interactions and task switches in social insect colonies with spatial heterogeneity. *Bulletin of Mathematical Biology*, **86**(5), 1091-1116.

9. S Elaydi, **Y. Kang**, and R Luís, 2024. Global Asymptotic Stability of Evolutionary Periodic Ricker Competition Models, *Journal of Difference Equations and Applications*, **30** (8), 1091-1116. DOI: 10.1080/10236198.2023.2281552

10. Brooke Anderson*, Heather Bowlby, Steven Saul, **Yun Kang**, Neil Hammerschlag, Lisa Natanson, and James Sulikowski, 2024. First insights into the vertical habitat use of young porbeagles in the Northwest Atlantic with implications for bycatch reduction strategies, *Marine and Freshwater Research*, **75**(12).

11. Nazmul Hasan, Md. Sharif Uddin, Md. Haider Ali Biswas, and **Yun Kang**, 2024. *A Mathematical Analysis of Nonlinear Predator-Prey System with Poaching Effect*, *Differential Equations and Dynamical Systems*. DOI:10.1007/s12591-023-00669-4

12. Dingyong Bai, Jiale Zheng, and **Yun Kang**, 2024. Global dynamics of a predator-prey model with a Smith growth function and the additive predation in prey. *Discrete and Continuous Dynamical Systems - B*, **29**(4), P1923-1960. DOI: 10.3934/dcdsb.2023161

13. Ravikant Singh, Archana Ojha, Pankaj Kumar Tiwari, Nilesh Kumar Thakur, and **Yun Kang**, 2024. Impact of time delay in a plankton-fish system with nonlinear harvesting and external toxicity. Accepted in *International Journal of Biomathematics.* https://doi.org/10.1142/S1793524523500961

14. M. G. Navas-Zuloaga*, Kaitlin M. Baudier, Jennifer H. Fewell, Noam Ben-Asher, Theodore P. Pavlic, and **Yun Kang**, 2023. A Modeling framework for adaptive collective defense: Crisis response in social-insect colonies. *Journal of Mathematical Biologu*, **87**(6), 1-57.

15. F Rao and **Y Kang**, 2023. Dynamics of a stochastic prey–predator system with prey refuge, predation fear and its carry-over effects, *Chaos, Solitons & Fractals*, **175**, 113935.

16. B Espinoza, **Y Kang**, and O Udiani, 2023. Consequences of traceable mobility in populations exhibiting strong Allee effect, *Epi-SCIENCE*, **1** (1). https://doi.org/10.15517/es.2023.55393

17. KK Pal, RK Rai, PK Tiwari, and **Y Kang**, 2023. Role of incentives on the dynamics of infectious diseases: implications from a mathematical model, *The European Physical Journal Plus*, **138** (6), 564.

18. Jun Chen*, Jordy O Rodriguez Rincon*, Gloria DeGrandi-Hoffman, Jennifer Fewell, John Harrison, and **Yun Kang**, 2023. Impacts of seasonality and parasitism on honey bee population dynamics. *Journal of Mathematical Biology*, **87** (19). https://doi.org/10.1007/s00285-023-01952-2.

19. L Rodriguez Rodriguez*, CE Bustamante Orellana, EK Chiou, L Huang, N Cooke, and **Y Kang**, 2023. A review of mathematical models of human trust in automation. *Frontiers in Neuroergonomics*, **4**, Pages 1171403.

20. R. Zhang, B. Xie, **Y. Kang**, and M. Liu, 2023. Modeling and analyzing quarantine strategies of epidemic on two-layer networks: Game theory approach. *Journal of Biological Systems*, **31** (01), 21-35.

21. L Wang*, Z Qiu, T Sasaki, and **Y Kang**, 2023. Dynamical behavior of a colony migration system: Do colony size and quorum threshold affect collective-decision? *SIAM Journal on Applied Mathematics*, special issue on *Life Sciences*, Page 43-64. https://doi.org/10.1137/22M1478690

22. L Liu*, M Fan, and **Y Kang**, 2023. Effect of nutrient supply on cell size evolution of marine phytoplankton, *Mathematical Biosciences and Engineering*, **20**(3), 4714-4740.

23. Anil Kumar, Muslim Malik, and **Yun Kang**, 2023. Dynamics for a hybrid non-autonomous prey-predator system with generalist predator and impulsive conditions on time scales. *International Journal of Biomathematics.* **16** (01), 2250067.

24. L Wang*, Z Qiu, and **Y Kang**, 2022. A Collective Colony Migration Model with Hill Functions in Recruitment, *International Journal of Bifurcation and Chaos*, **32**(14), 2250213.

25. S Elaydi, **Y Kang**, and R Luís, 2022. The effects of evolution on the stability of competing species, *Journal of biological dynamics*, **16**(1), 816-839. https://doi.org/10.1080/17513758.2022.2154860

26. T Feng, H Zhou, Z Qiu and **Y Kang**, 2022. Impacts of demographic and environmental stochasticity on population dynamics with cooperative effects, *Mathematical Biosciences*, **353**, 108910

27. T Nguyen*, C Magaldino*, J Landfair*, M Demir, PG Amazeen, and **Y Kang**, 2022. Distinguishing Driving Behavior Using the Dynamical Systems Analysis (DSA) Toolbox: Implications for Trust in Automation, *Proc. Hum. Factors Ergon. Soc. Annu. Meet.* **66**(1). https://doi.org/10.1177/107118132266

28. L Rodriguez Rodriguez*, C Bustamante Orellana*, GM Gremillion, L Huang, M Demir, N Cooke, JS Metcalfe, PG Amazeen, and **Y Kang**, 2022. Performance and relative risk dynamics during driving simulation tasks under distinct automation conditions, *Proc. Hum. Factors Ergon. Soc. Annu. Meet.* **66**(1). https://doi.org/10.1177/107118132266

29. C Bustamante Orellana*, L Rodriguez Rodriguez*, GM Gremillion, L Huang, M Demir, N Cooke, JS Metcalfe, PG Amazeen, and **Y Kang**, 2022. The Impact of Automation Conditions on Reliance Dynamics and Decision-Making, *Proc. Hum. Factors Ergon. Soc. Annu. Meet.* **66**(1). https://doi.org/10.1177/1071181322661477

30. Amita Tripathi, Pankaj Kumar Tiwari, Arvind Kumar Misra, and **Yun Kang**, 2022. Impacts of transpiration of agricultural crops and seeding on rainfall: Implications from a mathematical model. *International Journal of Biomathematics*, **15** (05), 2250028.

31. Vijay Pal Bajiya, Jai Prakash Tripathi, Vipul Kakkar, and **Yun Kang**, 2022. Modeling the impacts of awareness and limited medical resources on the epidemic size of a multi-group SIR epidemic model. *International Journal of Biomathematics*, **15**(07), 2250045.

32. Jia Liu, and **Yun Kang**, 2022. Spatiotemporal dynamics of a diffusive predator–prey model with fear effect. *Nonlinear Analysis: Modelling and Control*, **27** (5), 841-862.

33. Carlos Bustamante-Orellana*, Dingyong Bai, Jordy Cevallos-Chavez*, **Yun Kang**, Benjamin Pyenson*, and Congbo Xie, 2022. Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: An Application to Harpegnathos saltator. *Applied Sciences*, **12** (9), 4239

34. Xiaohui Guo*, Michael Lin, Asma Azizi, Lucas Saldyt, **Yun Kang**, Ted Pavlic, and Jen Fewell, 2022. Decoding alarm signal propagation of seed-harvester ants using automated movement tracking and supervised machine learning. *Royal Proceedings B.* **289** (1967), 20212176.

35. [i]Sunmi Lee, Chang Yong Han, Minseok Kim, and **Yun Kang**, 2022. Optimal control of a discrete-time plant-herbivore model in fluctuated environments. *Mathematical Biosciences and Engineering*, **19** (5), 5075-5103

36. Lisha Wang[*s],Tao Feng, Zhipeng Qiu, and **Yun Kang**, 2022. An eco-epidemiological model with social predation subject to a component Allee effect, *Applied Mathematical Modeling*, **101**, 111-131.

37. Pankaj Tiwari[i], Maitri Verma, Soumitra Pal, **Yun Kang**, and Arvind Misra, 2021. A delay nonautonomous predator-prey model for the effects of fear, refuge, and hunting cooperation. *Journal of Biological Systems*, **29**(04), 927-969. https://doi.org/10.1142/S0218339021500236

38. Wandi Ding, **Yun Kang**, and Anuj Mubayi, 2021. Special Issue: Mathematical modeling and analysis of social and ecological determinants for the dynamics of infectious diseases and public health policies. *Mathematical Biosciences and Engineering*, **18**(6):8535-8537. DOI: 10.3934/mbe.2021422

39. Pankaj Tiwari[i], Rajesh Kumar Singh, Debaldev Jana, **Yun Kang**, and Arvind Misra, 2021. A nonautonomous mathematical model to assess the impact of Algae on the abatement of atmospheric carbon dioxide. *International Journal of Biomathematics*, **14**(07), 2150059. https://doi.org/10.1142/S1793524521500595

40. Lucero Rodriguez Rodriguez*, Carlos Bustamante Orellana*, Jayci Landfair*, Corey Magaldino*, Mustafa Demir, Polemnia G. Amazeen, Jason S. Metcalfe, Lixiao Huang and **Yun Kang**, 2021. Dynamics of trust in automation and interactive decision making during driving simulation tasks, *Proc. Hum. Factors Ergon. Soc. Annu. Meet.* **65**(1). https://doi.org/10.1177/1071181321651288

41. [i]Feng Rao[s], Marisabel Rodriguez Messan, Angelica Marquez[**], Nathan Smith[*], and **Yun Kang**, 2021. Nutritional regulation influencing colony dynamics and task allocation in social insect colonies, *Journal of Biological Dynamics*, **15** (sup1), S35-61. https://doi.org/10.1080/17513758.2020.1786859

42. Tao Feng[*s], Dan Charbonneau, Zhipeng Qiu, and **Yun Kang**, 2021. Dynamics of task allocation in social insect colonies: Scaling effects of colony size versus work activities. *Journal of Mathematical Biology*, **85**(2), 1-53.

43. Dingyong Bai[i], **Yun Kang**, Shigui Ruan, and Lisha Wang[*s], 2021. Dynamics of an Intraguild Predation (IGP) food web model with strong Allee effect in the basal prey, *Nonlinear Analysis: Real World Applications*, **58**, 103206.

44. Nazmul Sk*, Pankaj Tiwari[i], **Yun Kang**, and Samares Pal, 2021. A nonautonomous model for the interactive effects of fear, refuge and additional food in a prey-predator system. *Journal of Biological Systems*, **29**(1), 107-145.

45. Angela Peace, **Yun Kang**, and many others, 2021. Stoichiometric ecotoxicology for a multi-substance world. *BioScience*, **71**(2), Pages 132-147, https://doi.org/10.1093/biosci/biaa160

46. [i]Congbo Xie, Meng Fan, and **Yun Kang**, 2021. Population dynamics of the giant Jellyfish *Nemopilema nomurai* with age structure. *Ecological Modelling*, **441**, 109412.

47. Komi Messan, Marisabel Rodriguez Messan, Jun Chen*, Gloria DeGrandi-Hoffman, and **Yun Kang**, 2021. Population dynamics of Varroa mite and honeybee: Effects of parasitism with age structure and seasonality. *Ecological Modeling*, **440**, 109359.

48. Jun Chen*, Gloria DeGrandi-Hoffman, Vardayani Ratti, and **Yun Kang**, 2021. Review on mathematical modeling of honeybee population dynamics. Special Issue: *Mathematical ecology of populations and ecosystems* of *Mathematical Biosciences and Engineering*, **18**(6), 182-213. doi: 10.3934/mbe.2021471

49. Tao Feng*[s], Zhipeng Qiu, and **Yun Kang**, 2021. Recruitment dynamics of social insect colonies, *SIAM Journal on Applied Mathematics*, **81**(4), 1579-1599.

50. [i] Ozgur Aydogmus and **Yun Kang**, 2021. Analysis of stationary patterns arising from a time-discrete metapopulation model with nonlocal competition. *Discrete and Continuous Dynamical Systems-B*, **27** (5), 2917. doi: 10.3934/dcdsb.2021166

51. Akhil Kumar Srivastav,* [i]Pankaj Kumar Tiwari, Prashant K Srivastava, Mini Ghosh, and **Yun Kang**, 2021. A mathematical model for the impacts of face mask, hospitalization and quarantine on the dynamics of COVID-19 in India: deterministic vs. stochastic. *Mathematical Biosciences and Engineering*, **18**(1), 182-213.

52. Lei Zhang*[s], Maoxing Liu, Qiang Hou, Asma Azizi[s], and **Yun Kang**, 2021. Dynamics of an SIS model on network with a periodic infection. *Applied Mathematical Modelling*, **89**, 907-918.

53. Pankaj Tiwari[i], Rajesh Singh, Subhas Khajanchi, **Yun Kang** and Arvind Misra, 2021. A mathematical model to restore water quality in urban lakes using Phoslock, *Discrete and Continuous Dynamical Systems-B*, **26** (6), 3143. doi: 10.3934/dcdsb.2020223

54. Gloria DeGrandi-Hoffman, Vanessa Corby-Harris, Yanping Chen, Henry Graham, Mona Chambers, Emily Watkins deJong, Nicholas Ziolkowski, **Yun Kang**, Stephanie Gage, Megan Deeter, Michael Simone-Finstrom, and Lilia de Guzman, 2020. Can supplementary pollen feeding reduce varroa mite and virus levels and improve honey bee colony survival? *Experimental and Applied Acarology*, **82**(4), 455-473.

55. Jai Prakash Tripathi[i], Sarita Bugalia, Vandana Tiwari, and **Yun Kang**, 2020. A predator-prey model with a Crowley-Martin functional response: a non-autonomous study. *Natural Resource Modeling*, **33**(4), e12287

56. Feng Rao[i], Junling Luo*, Zhongliang Zhang*, and **Y Kang**, 2020. Spatiotemporal dynamics of a predation system with time delay and spatial diffusion. *Journal of Statistical Mechanics: Theory and Experiment*, **10**, 103501.

57. Anupam Khatua, Tapan Kumar Kar, Swapan Kumar Nandi, Soovoojeet Jana, and **Yun Kang**, 2020. Impact of human mobility on the transmission dynamics of infectious diseases. *Energy, Ecology and Environment*, **5**, 389-406. https://doi.org/10.1007/s40974-020-00164-4

58. [i]Dingyong Bai, Wenrui Zeng, Jiachun Wu, and **Yun Kang**, 2020. Dynamics of a non-autonomous biocontrol model on native consumer, biocontrol agent and their predator. *Nonlinear Analysis: Real World Applications*, **55**, 103-136.

59. Rajanish Kumar Rai[i], Pankaj Kumar Tiwari[i], **Yun Kang**, and Arvind Kumar Misra, 2020. Modeling the effect of literacy and social media advertisements on the dynamics of infectious diseases, *Mathematical Biosciences and Engineering*, **17**(5), 5812-5848

60. Yongli Cai, Jiaxu Li, **Yun Kang**, Kai Wang, and Weiming Wang, 2020. The fluctuation impact of human mobility on the influenza transmission, *Journal of the Franklin Institute*. **357**(13), 8899-8924

61. [i]Dingyong Bai, Meng Fan, Jianshe Yu, and **Yun Kang**, 2020. Dynamics for a non-autonomous predator-prey system with generalist predator. *Journal of Mathematical Analysis and Applications*, **485**(2), 123820. doi.org/10.1016/j.jmaa.2019.123820

62. Guo Xiaohui*, Jun Chen*, Jennifer Fewell, and **Yun Kang**, 2020. Dynamics of social interactions, in the flow of information and disease spreading in social insects colonies: Effects of environmental events and spatial heterogeneity. *Journal of Theoretical Biology*, **492**, 110191.

63. Arvind Kumar Misra*, Rajesh Kumar Singh, Pankaj Kumar Tiwari, Subhas Khajanchi, and **Yun Kang**, 2020. Dynamics of algae blooming: effects of budget allocation and time delay. *Nonlinear Dynamics*, **100**, pages1779-1807.

64. [i]Yufang Wang[s], Kai Xu, **Yun Kang**, Haiyan Wang, Feng Wang, and Adrian Avram, 2020. Regional influenza prediction with sampling twitter data and PDE model. *International journal of environmental research and public health*, **17** (3), 678. doi.org/10.3390/ijerph17030678

65. [i]Saswati Biswas*, [i]Pankaj Kumar Tiwari, **Yun Kang**, and Samares Pal, 2020. Effects of zooplankton selectivity on phytoplankton in an ecosystem affected by free-viruses and environmental toxins. *Mathematical Biosciences and Engineering*, **17**(2): 1272-1317. doi: 10.3934/mbe.2020065

66. [i]Dingyong Bai, Jianshe Yu, and **Yun Kang**, 2020. Spatiotemporal dynamics of a diffusive predator-prey model with generalist predator. *Discrete & Continuous Dynamical Systems-S*, **13**(11). doi: 10.3934/dcdss.2020132

67. A. Azizi[s], C. Montalvo*, B. Espinoza, **Yun Kang**, and C. Castillo-Chavez, 2020. Epidemics on networks: Reducing disease transmission using health emergency declarations and peer communication. *Infectious Disease Modelling*, **5**, 12-22.

68. Jun Chen*, Komi Messan, Marisabel Rodriguez Messan, Gloria DeGrandi-Hoffman, Dingyong Bai, and **Yun Kang**, 2020. How to model honeybee population dynamics: stage structure and seasonality. *Mathematics in Applied Sciences and Engineering*, **1**(2), 91-206. https://doi.org/10.5206/mase/10559

69. [i]Yufang Wang, X. Wang, S. Chang, and **Yun Kang**, 2019. Product innovation and process innovation in a dynamic Stackelberg game. *Computers & Industrial Engineering*, **130**, 395-403.

70. [i]Feng Rao[s], Partha S Mandal, and **Yun Kang**, 2019. Complicated endemics of an SIR model with a generalized incidence under preventive vaccination and treatment controls. *Applied Mathematical Modelling*, **67**, 38-61.

71. Marisabel Rodriguez*, Robert E. Page Jr., and **Yun Kang**, 2018. Population and vitellogenin dynamics of a honeybee colony influencing division of labor. *Ecological Modeling*, **388**, 88-107.

72. Feng Rao[s], Carlos Castillo-Chavez, and **Yun Kang**, 2018. Dynamics of a stochastic delayed Harrison-type predation model: Effects of delay and stochastic components. *Mathematical Biosciences and Engineering*, **15**(6), 1401-1423.

73. Marisabel Rodriguez*, Darin Kopp*, Daniel Allen, and **Yun Kang**, 2018. Dynamical implications of bi-directional resources exchange within a meta-ecosystem. *Mathematical Biosciences*, **301**, 167-184.

74. Marisabel Rodriguez*, Nathan Smith*, Tin Phan**, Jonathan Woodbury**, and **Yun Kang**, 2018. Interactions between leaf-cutter ants and fungus garden: Effects of division of labor, age polyethism, and egg cannibalism. *Mathematical Modelling of Natural Phenomena*, **13**(3), article number 30, 32 pages.

75. Sherry Towers, Jun Chen*, Carlos Cruz*, Juan Melendez-Alvarez*, Jennifer Rodriguez*, Armando Salinas*, Fan Yu*, and **Yun Kang**, 2018. Quantifying the relative effects of environmental and direct transmission of norovirus. *Royal Society Open Science*, **5**: 170602.

76. Feng Rao[s], Carlos Castillo-Chavez, and **Yun Kang**, 2018. Dynamics of a diffusion reaction prey-predator model with delay in prey: Effects of delay and spatial components. *Journal of Mathematical Analysis and Applications*, **461**(2),1177-1214.

77. [i] Yongli Cai, **Yun Kang**, Malay Banerjee, and Weiming Wang, 2018. Complex Dynamics of a host-parasite model with both horizontal and vertical transmissions in a spatial heterogeneous environment. *Nonlinear Analysis: Real World Applications*, **40**, 444-465.

78. **Yun Kang**, Dingyong Bai[s], Lorenzo Tapia*, and Heather Bateman, 2017. Dynamical effects of biocontrol on the ecosystem: Benefits or Harm? *Journal of Applied Mathematical Modelling*, **51**, 361-385.

79. Komi Messan*, Gloria DeGrandi-Hoffman, Carlos Castillo-Chavez and **Yun Kang**, 2017. Migration effects on population dynamics of the honeybee-mite interactions. The special thematic issue on " Eco-Epidemiology" in *Mathematical Modeling of Natural Phenomena*, **12** (2), 84-115.

80. Riley Burnette*, H.L. Bateman, and **Yun Kang**, 2017. Seasonality and land cover type drive aphid dynamics in an arid city. *Journal of Arid Environments*, **144**, 12-20.

81. [i] Ozgur Aydogmus[s], **Yun Kang**, Musa Kavgaci, and Huseyin Bereketoglu, 2017. Dynamical effects of nonlocal interactions in discrete-time analogs of nonlocal Fisher equation. *Ecological Complexity*, **31**, 88-95.

82. [i] Yongli Cai[s], **Yun Kang**, and Weiming Wang, 2017. A stochastic differential equation SIRS epidemic model with ratio-dependent incidence rate. Journal of *Applied Mathematics and Computation*, **305**(C), 221-240.

83. **Yun Kang**, Sourav Kumar Sasmal*, and Komi Messan*, 2017. A two-patch prey-predator model with dispersal in predator driven by the strength of predation. *Mathematical Biosciences and Engineering*, **14**(4), 843-880.

84. [i] Ozgur Aydogmus[s], Wen Zhou, and **Yun Kang**, 2017. Evolution cooperation of two-strategy games with non-local interactions, *Mathematical Biosciences*, **285**, 25-42.

85. Komi Messan* and **Yun Kang**, 2017. A two patch prey-predator model with multiple foraging strategies in predators, *Discrete and Continuous Dynamical Systems-B*, **22**(3), 947-976.

86. [i]Yongli Cai[s], **Yun Kang**, and Weiming Wang, 2017. Global threshold dynamics of a reaction-diffusion epidemic model incorporating intervention strategies. The special issue on Current Topics in Mathematical Biology of *Mathematical Biosciences and Engineering*, **14**(5&6), 1071-1089.

87. Marisabel Rodriguez* and **Yun Kang**, 2016. Colony and evolutionary dynamics of a two-stage model with brood cannibalism and division of labor in social insects, *Natural Resource Modeling*, **29**(4), 633-662.

88. [i] Feng Rao[s] and **Yun Kang**, 2016. The complex dynamics of a diffusive prey-predator model with an Allee effect in prey, *Ecological Complexity*, **28**, 123-144.

89. Martin Helmkampf, Sasha Mikheyev, **Yun Kang**, Jennifer Fewell and Jurgen Gadau, 2016. Gene expression and variation in social aggression in the harvester ant *Pogonomyrmex californicus*. *Molecular Ecology*, **25**(15), 3716-3730.

90. **Yun Kang** and Guy Theraulaz, 2016. Dynamical models of task organization in social insect colonies. *Bulletin of Mathematical Biology*, **87** (5), 879-915.

91. **Yun Kang**, Krystal Blanco*, Talia Davies**, Ying Wang and Gloria DeGrandi-Hoffman, 2016. Disease dynamics of Honeybees with Varroa destructor as parasite and virus vectors. *Mathematical Biosciences*, **275**, 71-92.

92. [i] Dongyu Lv, Meng Fan, **Yun Kang** and Krystal Blanco*, 2016. Modeling refuge effect of submerged macrophytes in Lake System. *Bulletin of Mathematical Biology*, **78**(4), 662-694.

93. **Yun Kang**, 2016. Dynamics of a generalized Ricker-Beverton-Holt competition model subject to Allee effects. *Journal of Difference Equations and Applications*, **22**(5), 687-723.

94. [i] Yongli Cai[s], **Yun Kang**, Malay Banerjee and Weiming Wang, 2015. A stochastic epidemic model incorporating media coverage, *Communications in Mathematical Sciences*, **14**(4), 893-910.

95. Derdei Bichara[s], **Yun Kang**, Carlos Castillo-Chavez, Richard Horan, and Charles Perrings, 2015. *SIS* and *SIR* epidemic models under virtual dispersal. *Bulletin of Mathematical Biology*. 77, 2004-2034.

96. [i] Yongli Cai*, **Yun Kang**, Malay Banerjee, and Weiming Wang, 2015. A stochastic SIRS epidemic model with infection force under intervention strategies. *Journal of Differential Equations*, **259**, 7463-7502.

97. Sourav Kumar Sasmal*, **Yun Kang**, and Joydev Chattopadhyay, 2015. Intra-specific competition in predator can promote the coexistence of an eco-epidemiological model with strong Allee effects in prey. *Journal of BioSystems*, 137, 34-44.

98. **Yun Kang** and Jennifer Fewell, 2015. Coevolutionary dynamics of a social parasite-host interaction model: obligatory versus facultative social parasitism. *Natural Resource Modeling*, **28**(4), 398-455.

99. **Yun Kang**, Marisabel Rodriguez* and Stephen Evilsizor*, 2015. Ecological and evolutionary dynamics of a two-stage social insect model with egg cannibalism. *Journal of Mathematical Analysis and Applications*, **430**(1), 324-353.

100. Margaret-Rose Leung**, Dustin Padilla*, Baojun Song, **Yun Kang**, Noah Shemer** and Juan Vinagera**, 2015. A Symmetric Intraguild Predation Model for the Invasive Lionfish and Native Grouper. *Communications in Mathematical Biology and Neurosciences*. 2015:24

101. Peng Feng and **Yun Kang**, 2015. Dynamics of a modified Leslie-Gower model with double Allee effects. *Nonlinear Dynamics*, **80**, 1051-1062.

102. Oyida Udiani*, Noa Pinter-Wollan and **Yun Kang**, 2015. Identifying robustness in the regulation of foraging of ant colonies using an interaction based model with backward bifurcation. *Journal of Theoretical Biology*, **365**, 61-75.

103. [i] **Yun Kang**, Amiya Ranjan Bhowmick*, Sourav Kumar Sasmal* and Joydev Chattopadhyay, 2015. A host-parasitoid system with predation-driven component Allee effects in host population. *Journal of Biological Dynamics*, **9**(sp1), 213-232.

104. [i] Yongli Cai*, Malay Banerjee, **Yun Kang** and Weiming Wang, 2014. Spatiotemporal complexity in a predator-prey model with weak Allee effects. *Mathematical Biosciences and Engineering*, **11**(6), 1247-1274.

105. **Yun Kang** and Oyida Udiani*, 2014. Dynamics of a single species evolutionary model with Allee effects, *Journal of Mathematical Analysis and Applications*, **418** (1), 492-515.

106. **Yun Kang** and Carlos Castillo-Chavez, 2014. Dynamics of SI models with Allee effects and vertical transmission in conjunction with horizontal transmission, *Mathematical Biosciences*, **248**, 97-116.

107. **Yun Kang** and Carlos Castillo-Chavez, 2014. A simple epidemiological model for populations in the wild with Allee effects and the disease-modified fitness, *Discrete and Continuous Dynamical Systems-B*, **14** (1), 89-130.

108. **Yun Kang** and Carlos Castillo-Chavez, 2014. Dynamics of a simple two-patch SI models with Allee effects and disease modified fitness. *Second Order Elliptic Equations and Elliptic Systems: Contemporary Mathematics* in honour of Ronald Mickens' 70th birthday. 49-88.

109. **Yun Kang**, Sourav Kumar Sasmal*, Amiya Ranjan Bhowmick* and Joydev Chattopadhyay, 2014. Dynamics of a predator-prey system with prey subject to Allee effects and disease. *Mathematical Biosciences and Engineering*, **11**(4). 89-130.

110. **Yun Kang**, 2013. Permanence of a general discrete two-species interaction model with non-monotone per capita growth rates, *Discrete and Continuous Dynamical Systems-B*, **18**(8), 2123-2142.

111. **Yun Kang**, 2013. Scramble competitions can rescue endangered species subject to strong Allee effects, *Mathematical Biosciences*, **241**(1), 75-87.

112. **Yun Kang** and Lauren Wedekin*, 2013. Dynamics of a intraguild predation model with generalist or specialist predator, *Journal of Mathematical Biology*, **67**(5), 1227-1259.

113. **Yun Kang** and Carlos Castillo-Chavez, 2012. Multiscale analysis of compartment models with dispersal, *Journal of Biological Dynamics*, **6**(2), 50-79.

114. **Yun Kang** and Nicolas Lanchier, 2012. The role of space in the exploitation of resources. *Bulletin of Mathematical Biology*, **74**, 1-44.

115. **Yun Kang** and Hal Smith, 2012. Global dynamics of a discrete two-species Lottery-Ricker competition model, *Journal of Biological Dynamics*, **6**(2), 358-376.

116. **Yun Kang**, 2012. Pre-images of invariant sets of a discrete competition model, *Journal of Difference Equations and Applications*, **18**(10), 1709-1733.

117. **Yun Kang**, Rebecca Clark*, Michael Makiyama** and Jennifer Fewell, 2011. Mathematical modeling on obligate mutualism: Interactions between leaf-cutter ants and their fungus garden, *Journal of Theoretical Biology*, **289**, 116-227.

118. **Yun Kang** and Yakubu Abdul-Aziz, 2011. Dynamics of competition model subject to Allee Effects, *Nonlinear Analysis: Real World Applications*, **12**, 3329-3345.

119. **Yun Kang** and Dieter Armbruster, 2011. Dispersal effects on a discrete two-patch model for plant-insect interactions, *Journal of Theoretical Biology*, **268**, 84-97.

120. **Yun Kang** and Nicolas Lanchier, 2011. Dispersal effect on a deterministic and a stochastic two-patch model with Allee effect, *Journal of Mathematical Biology*, **62**, 925-73.

121. **Yun Kang** and Dieter Armbruster, 2011. Noise and seasonal effects on the dynamics of plant-herbivore models with monotone plant growth functions, *International Journal of Biomathematics*, **4**, 1-20.

122. **Yun Kang** and Peter Chesson, 2010. Relative nonlinearity and permanence, *Theoretical Population Biology*, **78**, 26-35.

123. **Yun Kang**, Dieter Armbruster and Yang Kuang, 2008. Dynamics of a plant-herbivore model, *Journal of Biological Dynamics*, **2**, 89-101.

Recent submissions (preprints):

124. Oyita Udiani*, **Yun Kang**, and Jennifer Fewell: Group size enhances division of labor but not productivity in forced associations of ant queens. Preprint.

125. Ying Wang, Osman Kaftanoglu, **Yun Kang**, Laura Creb, Gro Amdam, Robert E. Page, Jr.: TA/TYR1 plays a central role in honey bee (Apis mellifera) reproductive physiology and social behavior. Preprint.

126. M. G. Navas-Zuloaga*, C. N. Cook, B.H. Smith, and Y. Kang: From Individual Phenotypes to Collective Behavior in Honey-Bee Foragers: A Mathematical Model. Submitted to *JTB*.

127. Ozgur Aydogmus, Kubilay Dagtoros, and Yun Kang: Turing patterns arising from two species metapopulation models. Submitted to *Ecological Complexity*.

128. Feng Tao, and Yun Kang: Impact of stochasticity in the recruitment ability on collective foraging dynamics of social insect colonies. Submitted to *Mathematical Biosciences*.

129 Theophilus Kwofie and Yun Kang: Gang dynamics.

130 Theophilus Kwofie and Yun Kang: Obesity dynamics.

131 Tamantha Pizarro and Yun Kang: Mathematical Modeling of Cooperation in Varying Environments.

132 Jordy Oswaldo Rodriguez Rincon and Yun Kang: Mathematical Modeling of Plant and Pollinators.

133. Marisabel Rodriguez*, Stephen Evilsizor*, Feng Rao, Hal Smith and **Yun Kang**: Dynamics of a delayed two-stage model of social insects with egg cannibalism. Preprint

134. Lucero Rodriguez Rodriguez, Marisabel Rodriguez, Komi Messan, and **Yun Kang**: Mathematical Modeling of Natural Resource and Human Interaction: Applications to the harvesting of Pacific Yew for cancer treatment.

I.B. Awards/Grants:

I.B.1-Funded External Grants:

16. **Co-PI**: 01/01/2022-12/31/2024, **Climatic warming and fungicide effects on honey bees**, USDA-NIFA-AFRI, $681,708 (with PI Jon Harrison. My share is estimated as 30%).

15. **PI**: 09/01/2021-08/31/2025, **Multiscale Multistage Ecological and Evolutionary Modeling with Applications to Social Insect Colonies**, NSF-Mathematical Biology Program, $175,935 (Award ID: DMS 12052820).

14. **PI**: 10/01/ 2016-09/30/2025, **Complex Adaptive Systems of Social Insect Colonies: Emergence of Scaling, Social Dynamics, and Evolution Cooperation**, The James S. McDonnell Foundation 21st Century Science Initiative in *Studying Complex Systems Scholar Award*, $450,000 (Award ID: DOI-26 10.37717/22002047).

13. NSF of China (**Co-PI**, 20%), 2020-2023: *The study on the transmission dynamics of infectious diseases based on coevolution network* RMB 63,8000.

12. **Senior Personnel**: 03/01/2018-02/28/2022, **Mathematical & Theoretical Biology Institute Research Experience for Undergraduates**, NSF-REU Sites, $294,954 (with PI Carlos Castillo-Chavez. My share is estimated as 10%).

11. **PI**: 09/01/2017-08/31/2023, **Mathematical Modeling of Honeybee Populations in Heterogenous Environments: Linking Disease, Parasite, Nutrition, and Behavior**, NSF-Mathematical Biology Program, $290,436 (Award ID: DMS 1716802, with Co-PI Gloria DeGrandi-Hoffman).

10. DOD-ARMY: Army Material Command (**Co-PI**, 30%), 09-2020 to 08-2023: *Human-Autonomy Teaming: Capturing Team Effectiveness Factors to Support Feedback and Interventions*, $512,535.

9. **Co-PI**: 03/12/2018-03/11/2021, **Mathematical & Theoretical Biology Institute Research Experience for Undergraduates**, NSA (DOD)-REUs, $123,575 (with PI Carlos Castillo-Chavez. My share is estimated as 20%).

8. **Co-PI**: 02/01/2018-08/31/2021, SBIR 2016.2 SB162-005 Phase II-**Managing Emergent Behavior of Interacting Autonomous Systems** (ASC-SIM II), Defense Advanced Research Projects Agency (DARPA), $504,239 (Approved but pending, with PI Jennifer Fewell subcontracts to Boston Fusion Corp. ASU portion is $330,000, and my share from ASU is estimated as 40%).

7. **Research Partnerships**: 01/01/2017-01/01/2021, **Launching the first vaccination programs for a beneficial, pollinating insect**, Research Council of Norway, NOK 10348,000 (As a Research Partner on the aim regarding Mathematical Modeling of Honeybee Vaccine Programs with PI-Gro Amdam).

6. **PI**: 09/15/2013-08/31/2018, **Multiscale modeling of division of labor in social insects**, NSF-Mathematical Biology Program, $289,980 (Award ID: 1313312, with Co-PI Jennifer Fewell and Co-PI Dieter Armbruster).

5. **Co-PI**: 07/15/ 2016-06/30/2021, **Group Size, Scaling of Work, and Metabolism in Ant Colonies**, NSF IOS/DMS, $500,000 (Award ID: 1558127, with PI- Jennifer Fewell. My share is estimated as 25%).

4. **Co-PI**: 09/01/ 2015-08/30/2018, **Identifying and Addressing Mathematical Difficulties in Introductory Physics Courses**, NSF DUE, $250,000 (Award ID: 1504986, with PI- David Meltzer. My share is estimated as 25%).

3. **Co-PI**: 07/01/ 2014-06/30/2017, **ASU-Sloan Program for Exceptional Mentoring** (PEM, ASUF 30006275, with PI- Carlos Castillo-Chavez. My share is estimated as 20%). ASU FDN. $60,000

2. **Co-PI**: 09/15/2012-08/31/2016, **(WIDER-EAGER) Recognizing, Assessing, and Enhancing Evidence-Based Instructional Practices in STEM at Arizona State University, Polytechnic**, NSF, $298,352 (Award ID: 1256333, with PI David Meltzer. My share is estimated as 20%).

1. **Sole-PI**: 07/01/2011-08/31/2014, **Global Dynamics of Biological Systems**, *Collaboration Grants for Mathematicians*, Simons Foundation, $21,000.

I.B.2-Funded Internal Grants:

4. **PI** of **Summer 2013 Research Initiative** of School of Letters and Sciences, 2013: $15,000.

3. **PI** of **Research Grant** from School of Letters and Sciences, Jan -June 2013: *Mathematical modeling in life and social sciences*, $15,000.

2. **PI** of **Support and Enhancement (SSE) Competition Grant** from College of Technology & Innovation, Feb -June 2011: *Mathematical modeling of mutualism interactions in life and social sciences*, $13,400.

1. **PI** of **Research Grant** from Department of Applied Sciences and Mathematics, 2009 ($500), 2010 ($1,200), 2011 ($6,000).

I.B.3-Travel Awards/Grants/Supports:

13. Oct, 2024: **Travel Support** from *Banff International Research Center* at Canada to attend workshop on *Dynamical population models inspired by biology.*

12. Aug, 2022: **Travel Support** from *Fields Institute* at Canada $1000.

11. Oct, 2019: **Travel Grant** from *The Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA VII), $200 conference registration fee.

10. May, 2019: **Travel Grant** from *Evolution of Complex Life*, $250.

9. May, 2018: **Travel Grant** from *The 24th International Conference on Difference Equations and Applications*, 1200 EUR.

8. April, 2018: **Travel Grant** from Dartmouth College, $1,450.

7. Feb, 2018: **Travel Grant** from the Fields Institute, 1,200 CAD.

6. Jan, 2018: **Travel Grant** from NIMBios, $ 840.

5. April, 2015: **Travel Grant** from Mathematical Biological Institute *Evolutionary Game Theory Workshop*, $500.

4. July, 2013: **Travel Grant** from NSF-*2013 AARMS Mathematical Biology Workshop*, Memorial University, St John's, Newfoundland, $1,650.

3. July, 2012: **Travel Grant** from *The 9th American Institute of Mathematical Sciences* (AIMS) Conference on *Dynamical Systems, Differential Equations and Applications* (9th ICDSDEA 2012), $200.

2. May, 2012: **Travel Grant** from *The 2012 Progress on Difference Equations* (PODE 2012), $700.

1. July, 2011: **Travel Grant** from *Society for Industrial and Applied Mathematics* (SIAM) and NSF for *the 7th International Congress on Industrial and Applied Mathematics* (ICIAM 2011), $2,400.

I.B.4-Research/Travel Grant/Fellowship Received by Students

53. Fall 2024: Carlos Bustamante Orellana obtained travel fund from GPSA to attend *Cyberpsychology, Cybertheory & Social Networking* Conference (CYPSY27) and *Human Factors and Ergonomics Society (HFES) 68th Annual Meeting.*

52. Fall 2024: Tamantha Pizarro from GPSA and *The Eighth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA-IX), Oct 18-19,University of Wisconsin-Milwaukee.

51. Summer 2024: 2024 SIAM Student Chapter Certificate of Recognition acknowledging Theophilus Kwofie for exceptional service to the Arizona State University Student Chapter during the 2023-2024

50. Summer 2024: Tamantha Pizarro has been awarded travel grants from Graduate College and SIAM conference to attend 2024 SIAM Annual Meeting held July 8-12, 2024.

49. Spring 2024: Theophilus Kwofie obtained travel funds to attend JMM 2024.

48. Spring 2024: Lucero Rodriguez Rodriguez obtained Graduate College Completion Fellowship.

47. Fall 2023: Theophilus Kwofie was nominated by the School of Mathematical and Statistical Sciences as the 2023 Student Leader.

46. Fall 2023: Theophilus Kwofie has been awarded 2023-24 GPSA up to $900 to attend AMS in Augugst 2023

45. Fall 2023: Tamantha Pizarro has been awarded 2023-24 Graduate College Travel Award up to $300 to attend Biomathematics and Ecology Education and Research (BEER) Symposium.

44. Fall 2023: Tamantha Pizarro has been awarded a travel grant in the amount of $750 from Biomathematics and Ecology Education and Research Conference (BEER) to attend the 16th Annual Symposium on BEER, at Virginia Commonwealth University on November 3-5, 2023.

43. Fall 2022: Lucero Rodriguez Rodriguez was nominated for Finalist - *2022 Chapanis Award*.

42. Fall 2022: Jun Chen obtained travel fund from GPSA and *The Eighth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA VIII)(> $900).

41. Fall 2022: Carlos Bustamante Orellana obtained travel fund from GPSA and SHESC (> $900).

40. Fall 2022: Lucero Rodriguez Rodriguez obtained travel fund from Graduate College Travel Award, GPSA and nominated for the Finalist - 2022 Chapanis Award (> $900).

39. Fall 2022-Spring 2023: Gabriela Navas Zuloaga obtained Graduate College Completion Fellowship

38. Summer 2022: Jun Chen obtained travel fund for IUSSI (> $1200).

37. Summer 2022: Gabriela Navas Zuloaga obtained Summer Research Writing Grant.

36. Spring 2022-JMM meeting: Jun Chen, Lucero Rodriguez Rodriguez and Gabriela Navas Zuloaga each obtained JMM 2022 travel grant (each $1200).

35. Spring 2022: Both Lucero Rodriguez Rodriguez and Gabriela Navas Zuloaga obtained GPSA travel grant (each $900).

34 Fall 2021: Both Lucero Rodriguez Rodriguez and Carlos Bustamante Orellana obtained GPSA travel grant (each $900).

33. Fall 2021&Spring 2022: Jun Chen obtained Graduate College Completion Fellowship for Fall 2021 and Spring 2022. ($9600+course credits)

32. Fall 2019: Jun Chen obtained both travel awards from both *School of Human Evolution & Social Change* (SHESC: $500) and *Graduate and Professional Student Association* (GPSA$500)

31. Fall 2018: Brian Sweeney obtained Research Award on his project of mathematical modeling of honeybee from Science and Mathematics Unit, College of Integrative Sciences and Arts.

30. Fall 2018: Fatima Barat Ali obtained Research Scholarship from Barrett the Honors College ($2,000).

29. Spring 2018: Marisabel Rodriguez obtained Graduate College Fellowship ($5,000).

28. Fall 2017: Fatima Barat Ali and Jeffrey Chen each obtained Bidstrup Fellowship ($2000) for their research projects on *Mathematical Modelling of Social Insects*, respectively.

27. Fall 2017: Komi Messan successfully obtained Graduate College Completion Fellowship for Fall 2017 (e.g., a $9,500 stipend in Fall 2017 plus a tuition waiver for 1 credit hour.).

26. Spring, 2017: Fatima Barat Ali won the Barrett Technology grant ($1500)

25. Summer 2017: Komi Messan successfully obtained SHECS Fellowship ($7000).

24. Fall 2016: Fatima Barat Ali and Jeffrey Chen each obtained Bidstrup Fellowship ($2000) for their research projects on *Mathematical Modelling of Social Insects*, respectively.

23. March 2017-Feb 2019: **NSF Postdoc Fellowship** (NSF-DBI-1610889) received by Oyita Udiani. $138,000

22. June-August, 2016: **Graduate-Level Research Fellowship in Industrial Projects for Students** for the graduate student-Krystal Blanco, UCLA and Berlin, Germany.

21. August, 2016: **Travel Grant** for undergraduate student -Fatima Amiri for her research project on *Experiment and mathematical modeling for Harpegnathos Saltator ant* from *MAA MathFest 2016* in Columbus, Ohio, August 3-6, 2016. $500.

20. July, 2016: **Travel Grants** for graduate students -Xiaohui Guo and Michael Lin for their research projects on *Environmental and spatial heterogeneity's effects on information flow in ant colonies: An agent-based model study* and *Does individual variation matter in spreading alarm signal on social network of seed harvester ants' colonies (Pogonomyrmex californicus)?* for *The 4th Workshop on Biological Distributed Algorithms*, Chicago, IL USA, July 25, 2016. $750 +750.

19. June, 2016: **Travel Grant** for graduate student -Marisabel Rodriguez from School of Statistics and Mathematics (ASU) for *The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (AIMS 2016), Orlando, Florida, U.S, July 01-05, 2016. $250.

18. Oct, 2015: **Travel Grant** for graduate student -Marisabel Rodriguez from School of Statistics and Mathematics (ASU), Graduate College (ASU) and *The 8th International Symposium on Biomathematics and Ecology: Education and Research-2015*, Illinois State University, Normal, IL, $ (500+500+150).

17. Oct, 2015: **Travel Grant** for undergraduate student -Katherine Kincade from *The 8th International Symposium on Biomathematics and Ecology: Education and Research-2015*, Illinois State University, Normal, IL, $150.

16. Oct, 2015: **Travel Grant** for undergraduate student Talia Davies for *The 8th International Symposium on Biomathematics and Ecology: Education and Research-2015*, Illinois State University, Normal, IL, $750.

15. Oct, 2015: **Travel Grant** for graduate student -Komi Messan from *The 35th Southeastern Atlantic Regional Conference on Differential Equations*, The University of North Carlonina at Greensboro, Greensboro, NC. $750.

14. March, 2015: **Travel Grant** for graduate student -Krystal Blanco for *The Infinity Possibility Conference for Women in Sciences*, Oregon State University. $500

13. Oct, 2014: **Travel Grant** for undergraduate student -Jose Valenzuela from *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, $500.

12. Oct, 2014: **Travel Grant** for graduate student -Komi Messan from *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, $500.

11. Oct, 2014: **Travel Grant** for graduate student -Marisabel Rodriguez from *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, $500.

10. Oct, 2014: **Travel Grant** for graduate student -Oyita Udiani from *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, $500.

9. Aug, 2014: **Travel Grant** for undergraduate student -Jose Valenzuela from *MAA MathFest 2014*, $400.

8. Aug, 2014: **Travel Grant** for graduate student -Oyita Udiani from *SIAM-LS 2014*, $650.

7. July, 2014: **International Travel Grant** for graduate student -Sourav Kumar Samsal from *National Board for Higher Mathematics (NBHM)*, $2000.

6. Oct, 2013: **Travel Grant** for graduate student -John McKay from *The Sixth International Symposium on Biomathematics and Ecology: Education and Research-2013*, Marymount University Arlington, VA, $400.

5. Oct, 2013: **Travel Grant** for graduate student -Oyita Udiani from *The Sixth International Symposium on Biomathematics and Ecology: Education and Research-2013*, Marymount University Arlington, VA, $200.

4. Oct, 2013: **Travel Grant** for graduate student -Sourav Kumar Sasmal from *The Fourth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA IV), Texas Tech University in Lubbock, Texas, $1,500.

3. 2013-2015: **Graduate Assistance in Areas of National Need** (GAANN) Fellowship for graduate student -Oyita Udiani.

2. July, 2013: **Travel Grant** for graduate student -John McKay from NSF-*2013 AARMS Mathematical Biology Workshop*, Memorial University, St John's, Newfoundland, $1,200.

1. October, 2011: **Travel Grant** for graduate student -Lauren Wedekin from *The Third International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA III), Trinity University, San Antonio, Texas, $800.

I.B.5-Pending/Submitted Grants:

1. NSF-Mathematical Biology (**PI**), 2024-2027: *Optimizing Honeybee Survival: Modeling Agrochemicals and Climate Change for Sustainable Pollination*, $529,000

I.B.6-Awards and Fellowships:

- 2023: Arizona State University's Nomination for the Blavatnik Award in Applied Mathematics of the Physical Sciences category.
- 2016: Arizona State University Leadership Academy, peerLA Cohort IV Member.
- 2013: **Certificate of Excellence in Reviewing** for the journal of *Mathematical Biosciences* in recognition of an outstanding contribution to the quality of the journal.
- Fall 2013: **College Marshal** of the School of Letters and Sciences for the undergraduate commencement ceremony.
- 2010—2011, **Project NExt Fellow**, Mathematical Association of America (MAA). *Project NExT* (New Experiences in Teaching) is a professional development program of the MAA for new or recent PhD.s in the mathematical sciences.

I.C.-Scholarly Presentations:

I.C.1-Invited Lectures/Talks/Workshop Given in the National/International Conferences:

- Invited talks: Joint Mathematical Meetings (JMM 2025), Seattle, Jan 8-11, 2025.

- Invited talk: *Dispersal and Sociality of Social Insect Colonies* in the workshop on *Dynamical Models Inspired by Biology* held at the Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Oct 6-11, 2024.

- Invited talk: *Mac-Inspired Social Network Modeling with Application to Social Insect Colonies* in the*SIAM Minisymposium in Honor of James Mac Hyman* in the SIAM Annul Meeting, Spokane, Washington, July 8-12, 2024.

- Invited talks: *Foraging Dynamics in Social Insect Colonies: Mechanisms of Backward Bifurcations and Impacts of Stochasticity* and *Optimal control of a discrete-time plant–herbivore/pest model with bistability in fluctuating environments* of The 29th International Conference on Difference Equations and Applications (ICDEA 2024) held in Paris, France, June 24-28, 2024.

- Invited talk: *Collective Defense Dynamics of Social Insect Colonies* in the International Conference on Mathematical Analysis and Applications in Science and Engineering, June 20-22, 2024.

- Invited lecture: *Optimal control of a discrete-time plant-pest model with bistability and fluctuating environments*, Yangzhou University, June 13, 2024.

- Invited lecture: *Ecological and Evolutionary Modeling of Social Insect Colonies as Complex Adaptive Systems*, Shanghai Jiaotong University, June 11, 2024.

- Invited lecture: *Cooperative versus Solitary of nest founding strategy with Applications in Social Insect Colonies*, Nanjing Technology University, June 6, 2024.

- Invited lecture: *Mathematical Models for Colony Migration*, Guangzhou University, June 3, 2024.

- Invited talk: *Impacts of Pesticide and Seasonality on Honeybee Dynamics* of The Fourteenth International Conference on Recent Advances in Applied Dynamical Systems held in Xinyang Normal University, Xinyang, Henan, China, May 30-June 2, 2024.

- Invited lecture: *Mathematical Modeling of Complex Adaptive Systems and Optimization* in Exploring Research Frontiers in Dynamical Systems during May 20-24, 2024, online. https://sites.google.com/view/fdp-2024/about-fdp

- Invited talk: *Cooperative versus Solitary Strategies in Nest Founding: Impacts of Seasonality, stochasticity, and Space*, 2024 Spring Eastern Sectional AMS Meeting, Washington, DC, April 6-7, 2024.

- Invited talk: *Collective Defense Dynamics of Social Insect Colonies* at AMS Special Session of *Dynamical Systems Modeling for Biological and SocialSystems*, Joint Mathematical Meetings (JMM 2024), San Francisco, Jan 3-6, 2024.

- Invited Mathematical Colloquium: *Dynamical Modeling of Complex Adaptive Systems: Applications to Social Insect Colonies* at Mathematical Colloquium in University of Wisconsin at Milwaukee, Nov 17, 2023.

- Invited talk: *Impacts of demographic and environmental stochasticity on population dynamics with cooperative effects* in the special session on *Delay and stochastic differential equations and applications in Mathematical Biology*, ICIAM 2023 Tokyo (10th International Congress on Industrial and Applied Mathematics), Waseda University, Tokyo, Japan, August 20-25, 2023

- Invited talk: *Impacts of stochasticity on population dynamics with cooperative effects* under Special Session of *Nonlinear differential and difference equations with applications to population dynamics*, The 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications (AIMS 13), University of North Carolina Wilmington, Atlanta, Jun 01-05, 2023.

- Invited keynote talk: *Ecological and Evolutionary Modeling of Complex Adaptive Systems* at the Workshop on *Advances in Mathematical Ecology* at the University of Pittsburgh, Jun 1-2, 2023.

- Invited plenary talk: *Mathematical Models of Complex Adaptive Systems* at The 4th International Conference on Mathematical Techniques and Applications (ICMTA- 2023), March 22-24, 2023

- Invited talk: *Impacts of seasonality and parasitism on honey bee population dynamics*, AMS 2023 Spring Southeastern Sectional Meeting at Georgia Institute of Technology, Atlanta, GA, March 18-19, 2023.

- Invited talks: 1. *Communication dynamics of a dyad interaction model with applications to human-automation teaming* in AMS Special Session on *Recent Trends in Discrete-Time Ecological and Epidemiological Models*; 2. *Dynamical behavior of a colony migration systems: Do colony size and quorum threshold affect collective-decision?* in AMS Special Session on *Complex Systems in the Life Sciences*, JMM 2023, Boston, Jan 4-7, 2023.

- Invited plenary lecture: *Mathematical Modeling of Complex Adaptive Systems with Applications in Social Insect Colonies* in the IV International Meeting on Mathematical Sciences (IV EICM), College of Mathematicians of Peru (COMAP) - Lambayeque Region, Dec 14-17, 2022 (Virtual). https://eicmfacfym.wixsite.com/2022

- Invited talk: *Complex Adaptive Systems: Applications in Human Systems and Social Insect Colonies*, Yangzhou University, Virtual, Oct 02, 2022

- Invited talk: *Mathematical Modeling of Cooperative Nest Founding*, in AMS Special Session on Session *Mathematical Modeling of Biological and SocialSystems*, AMS Fall Western Sectional Meeting, University of Utah, Salt Lake City, UT, Oc 22-23, 2022.

- Invited talk: *Mathematical modeling of Complex Adaptive Systems with applications in Social Insect Colonies*, workshop on *Modeling Population Dynamics in Ecology, Environment and Epidemiology*, The Fields Institute, University of Toronto, Aug 14-19, 2022.

- Invited talk: *How may social interaction and task switching generate spatial heterogeneity in social insect colonies?*, Annual Meeting of Animal Behavior Society, Costa Rica, July 19-23, 2022.

- Invited Mathematical Colloquium: *Mathematical Modeling of Complex Adaptive Systems-Applications to Honeybee Population Dynamics*, University of JianSu, Virtual, Jun 10, 2022.

- Invited Mathematical Colloquium: *Mathematical Modeling of Collective Defense in Social Insect Colonies*, Department of Mathematics, University of Central Florida, Virtual, May 03, 2022

- Invited talk: *Mathematical Modeling of Complex Adaptive Systems- Dynamics of Task Organization*, UTK-SIAM Chapter, Virtual, April 28, 2022.

- Invited Mathematical Colloquium: *Dynamics of Task Organization in Social Insect Colonies and Human-Robotic Teaming*, Department of Mathematics, Hong Kong Polytechnic, Virtual, April 24, 2022.

- Invited talk: *Recruitment Dynamics of Social Insect Colonies* at AMS Special Session on *Complex Adaptive Systems and Evolutionary Models in Biology and Psychology*, Joint Mathematics Meetings, Virtual, April 6-9, 2022.

- Invited talk: *Mathematical Modeling of Complex Adaptive Systems* in International Conference on Advances in Mechanics, Modeling, Computing and Statistics (ICAMMCS), Department of Mathematics, BITS Pilani, Pilani Campus (India), March 19-21, 2022.

- Invited talk: *Impacts of demographic and environmental stochasticity on population dynamics with cooperative effects* in the International Conference on Mathematics, Statistics, and Data Science (ICMSDS-2022), School of Mathematics and Statistics & School of Data Analytics, Mahatma Gandhi University, Kottayam, Kerala, India, 6-27 February 2022.

- Invited Mathematical Colloquium: *Complex Adaptive Systems: Task Organization of Social Insect Colonies*, Department of Mathematics, Texas Tech University, Feb, 21 2022

- Invited Mathematical Colloquium: *How Mathematics Save Honeybee?*, Department of Mathematics, University of Toledo, 21 Jan 2022

- Invited lecture: *Mathematical Modeling of Complex Adaptive Systems* at *Online Undergraduate Resource Fair for the Advancement and Alliance of Marginalized Mathematicians* (OURFA2M2), Dec 4 & 5, 2021.

- Invited talk: *Foraging and Recruitment Dynamics of Social Insect Colonies*, OSU Winter Workshop on *Competition Dynamics in Biology*, Dec 15-17, 2021.

- Invited talk: The 4th Annual Meeting of the SIAM Texas-Louisiana Section (TXLA21), University of Texas Rio Grande Valley, South Padre Island, Texas, November 5 - 7, 2021.

- Invited talk: *Optimal control of a discrete-time plant-pest model with bistability and fluctuating environments*, Virtual 26th International Conference on Difference Equations and Applications (ICDEA 2021), Sarajevo, Bosnia and Herzegovina, July 26-30, 2021.

- Invited talk: *Dynamics of a Diffusion Reaction Prey-Predator Model with Delay in Prey: Effects of Delay and Spatial Components*, The 2021Virtual Annual Meeting and Conference of the Society for Mathematical Biology (SMB), June 13-17, 2021.

- Invited talk:*Mathematical Modeling of Complex Adaptive Systems*, Virtual 2021 Stoking Enthusiasm for Konstanz, Jun 24, 2021.

- Invited talk: *Optimal control of a discrete-time plant-pest model with bistability and fluctuating environments*, Virtual Joint Mathematics Meetings, Jan 6-9, 2021.

- Invited talk: *The role of demographic and environmental stochasticity in a population model with a component Allee effect* in M24-Mathematical Advances in Ecology and Evolution, The 3rd Annual Meeting of the SIAM Texas-Louisiana Section, October 16 -18, 2020, Virtual Zoom Meeting Hosted by Texas A&M University.

- Invited Plenary Speaker: *Mathematical Modeling of Complex Adaptive Systems of Social Insect Colonies* in Scientific Computing Around Louisiana (SCALA) at Digital Media Center Theatre, Louisiana State University, Feb 7-8, 2020.

- Invited Mathematical Colloquium: *How Can Mathematics Save Honeybees?* in Department of Mathematics, Tulane University, Feb 5-6, 2020.

- Invited two talks: *Population dynamics of Honeybees: Interplay effects of parasites and nutrition* (January 18 2020) and *Dynamics of task allocation in social insect colonies: Scaling effects of colony size versus work activities* (January 16 2020) in Joint Mathematics Meetings 2020, Denver, CO, January 15-18, 2020.

- Invited talk: *Nutritional Regulation Influencing Colony Dynamics and Task Allocations in Social Insect Colonies* in *The Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA VII), Oct 12-14, Tempe, AZ, 2019.

- Invited talk: *Population Dynamics of Honeybees: Effects of Parasites and Nutrition* The 2019 Annual Meeting and Conference of the Society for Mathematical Biology (SMB) held in Montreal (Canada) from July 21-26, 2019.

- Invited talks: *Mathematical modeling of social insects* and *Social Network Models of Social Insect Colonies: Information Versus Task Switching Dynamics* at the International Congress on Industrial and Applied Mathematics, July 15-19, Valencia, Spain.

- Invited lectures: *Mathematical Modeling of Complex Adaptive Systems* in "Mathematical modeling in life and medical sciences" at National Institute for Mathematical Sciences (NIMS), July 2-4, 2019.

- Invited lecture: *Complex Adaptive Systems of Social Insect Colonies* in the international conference of *Most Recent Progresses on Nonlinear Dynamics and Mathematical Biology* held in North University of China, Jun 27-28, 2019.

- Invited talk: *Modeling Population on Dynamics of Honeybee: Parasite, Disease and Nutrition* in Joint Mathematics Meetings 2019, Baltimore, MD, January 16-19, 2019.

- Invited talk: *Mathematical Modeling on Honeybee Population Dynamics with the Nutritional Status* in AMS Fall Western Sectional Meeting, San Francisco State University, San Francisco, CA, October 27-28, 2018.

- Invited talk: *Dynamics of Social Interactions and Agent Spreading in Ant Colonies: Effects of Environmental Events and Spatial Heterogeneity* in The 8th International Symposium on Biomathematics and Ecology: Education and Research, Arizona State University, Tempe, AZ, Oct 5-7, 2018.

- Invited talks: *On the Preservation of Cooperation in Two-Strategy Games with Nonlocal Interactions* (S11) and *The complex dynamics of a diffusive prey-predator model with an Allee effect in prey* (S46) in The 12th AIMS Conference on *Dynamical Systems, Differential Equations and Applications*, Taipei, Taiwan, July 5-9, 2018

- Invited talk: *Mathematical Modeling of Social Insect Colonies as Complex Adaptive Systems*, The 2018 Guangzhou Mathematics-Tianyuan Exchange Event, Guangzhou University, Guangzhou, China, June 25-30, 2018.

- Invited talk: *Complicated endemics of an SIR model with a generalized incidence under preventive vaccination and treatment controls* in the special session of *Understanding Parasitic and Viral Diseases from a Mathematical Perspective* in the *6th International Conference on Mathematical Biological*, June 22-25, 2018, Beijing, PR China.

- Invited Plenary Speaker: *Discrete Time Population Models: Permanence, Relative Permanence, and Allee effects* in The 24th International Conference on Difference Equations and Applications (ICDEA 2018), Technische Universit Dresden, Germany, May 21-25, 2018.

- Invited Colloquium: *Mathematical Modeling of Complex Adaptive Systems*, Mathematics Department, Dartmouth College, April 26-27, 2018

- Invited talk: Workshop on *Bee and Pollination Modeling* at the Fields Institute in the Thematic Program on *Emerging Challenges in Mathematical Biology* (January 1 to June 30, 2018) at the Fields Institute in Toronto, Ontario, Canada, Feb 26-28, 2018.

- Invited workshop: NIMBios investigative workshop on *Stoichiometric Ecotoxicology*, University of Tennessee, Knoxville, Jan 17-19, 2018.

- Invited talks: *Dynamical effects of nonlocal interactions in discrete-time* in the special session of *Discrete Dynamical Systems and Applications*; *Population dynamics of honeybee: Effects*

of disease, parasites, and dispersal behavior in the special session on *Advances in Applications of Differential Equations to Disease Modeling*; and *Dynamics of a diffusion reaction prey-predator model with delay in prey: Effects of delay and spatial components* in the special session on *Mathematical Modeling of Natural Resources* at Joint Mathematics Meetings (JMM), San Diego, Jan 10-13, 2018.

- Invited talk: *Dynamics of hierarchy establishment from nonlinear social interactions and metabolic costs* at *The Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA VI), University of Arizona, Tucson, October 20-22, 2017.

- Invited talks: *Dynamical models of task organization in social insect colonies* (SS51) and *Population dynamics of honeybees with varroa destructor as parasite and virus vector: the potential effects of foraging behavior* (SS05) in *The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (AIMS 2016), Orlando, Florida, U.S, July 01-05, 2016.

- Invited talk: *Honeybee disease dynamics and colony collapse disorder*, a special session on *Complex Biological Systems* at *The 8th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2015), Illinois State University, Normal, IL, October 09-11, 2015.

- Invited talk: *Colony Collapse Disorder (CCD) of Honeybees: linking parasite infestations, diseases, and nutrient effects*, a special session on *New Developments in Population Dynamics and Epidemiology* at AMS 2015 Spring Southeastern Sectional Meeting, Huntsville, AL, March 27-29, 2015.

- Invited talk: *Ecological and evolutionary dynamics of a two-stage model for social insects*, a special session on *Mathematics in Natural Resource Modeling* at *Joint Mathematics Meetings*, Baltimore, MD, Jan 10-13, 2015.

- Invited talk: *Ecological and evolutionary models of social insects*, *Workshop on Mathematical Biology and Nonlinear Analysis*, The University of Miami, Coral Gables, Florida, Dec 19-21, 2014.

- Invited talk: *Mathematical model of a two-stage model for social insects*, a special session on *Social Insects as Complex Systems* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2014), Claremont Colleges, Claremont, CA, October 10-12, 2014.

- Invited talk: *Ecological and evolutionary dynamics of a single species population model with a component Allee effect*, a special session on *Mathematical Models in Biology and Epidemiology* at *SIAM Conference on the Life Sciences*, Sheraton Charlotte, Charlotte, North Carolina, August 04-07, 2014.

- Invited seminar: *Population dynamics of Intraguild predation*, Department of Mathematics and Information Science, Zhejiang University of Sciences and Technology, Hangzhou, P.R.China, June 16, 2014

- Invited seminar: *Mathematical model of social insects*, College of Mathematics and Information Science, Wenzhou University, Wenzhou, P.R.China, June 13, 2014

- Invited lecture: *Mathematical modeling of social insects* in the international conference of *Eighth International Conference on Recent Advances in Applied Dynamical Systems*, Guilin University of Electronic Technology, Guilin, China, June 2-4, 2014.

- Invited talk: *A simple model of foraging activity in colonies of seed harvester ants*, a special session on *Mathematics in Natural Resource Modeling* at *Joint Mathematics Meetings*, Baltimore, MD, Jan 15-18, 2014.

- Invited seminar: *Ecological and evolutionary dynamics of biological models*, the BioCircuits Institute, University of California, San Diego, Jan 07, 2014.

- Invited talk: *Dynamics of a general stochastic differential equation SIRS epidemic model with ratio-dependent incidence rate*, a special session on *Disease Dynamics and Control* at *The 6th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2013), Marymount University, Arlington, VA, October 11-13, 2013.

- Invited talk: *Dynamics of SI models with both horizontal and vertical transmissions as well as Allee effects*, a special session on *Mathematical Models in Biology and Physiology* at *the American Mathematical Society Southeastern Sectional Meeting*, University of Louisville, Louisville, KY, October 5-6, 2013.

- Invited talk: *Permanence of ecological models with nonlinear per capita growth rates*, a special session on *Persistence and Permanence in Multi-Species Population Models* at *The Fourth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA IV), Texas Tech University in Lubbock, Texas, October 4-6, 2013

- Invited lecture: *Allee effects in Eco-epidemiology models*, The Lloyd G. Roeling Mathematics Conference,UL Lafayette campus, Nov 02-04, 2012.

- Invited talk: *A simple epidemiological model with Allee effects and the disease-modified fitness*, Special Sessions of *Biomathematics*, Fall Western Sectional Meeting, American Mathematical Society (AMS), Tucson, Arizona, October 27-28, 2012.

- Invited talk: *Multiple attractors in Intraguild Predation models with generalist or specialist predator* at the special section *Mathematical Models in Biology and Medicine* in the 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications (AIMS 2012), Orlando, Florida, U.S, July 01-05, 2012.

- Invited talk: *The relative permanence of a discrete-time competition model* at the *Progress in Difference Equations* (PODE 2012), Virginia Commonwealth University in Richmond, Virginia, USA, May 13 -18, 2012.

- Invited talks: 1. *Complicated dynamics of a simple SI model with Allee effects* and 2. *Mathematical modeling on obligate mutualism: leaf-cutter ants and fungus growth during early colony expansion* at the *International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2011), University of Portland, Portland, OR, December 17-18, 2011.

- Invited talk: *Interplay between Allee effects and competition* at *The Third International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA III), Trinity University, San Antonio, Texas, October 7-9, 2011.

- Invited talk: *The role of space in the exploitation of resources* in the minisymposium on *Modeling of Ecological Systems* at ICIAM 2011, Vancouver, BC, Canada, July 18 - 22, 2011.

- Invited talk: *Modeling an Obligate Mutualism: Leaf-cutter ants and its fungus garden* in the minisymposium on *Recent applications of dynamical systems in ecology* at *Society for Industrial and Applied Mathematics (SIAM) Conference on Applications of Dynamical Systems*, Snowbird, Utah, USA, May 22-26, 2011.

- Invited lecture: *Relative Permanence in Biological Systems* in the international conference of *Fifth International Conference on Recent Advances in Applied Dynamical Systems*, Shanghai Normal University, Shanghai, China, May 16-18, 2011.

- Invited talk: *A discrete two-patch model of plant-insect interactions with Allee-like effects* in the special session on *Continuous and Discrete Dynamical Systems* in American Mathematical Society Meeting, 2010 Fall Western Section, Los Angeles, CA, October 9-10, 2010 .

- Invited talk: *Dynamics of plant-herbivore models with monotone plant growth rate*, 2009 Fall Eastern Section Meeting University Park, PA, October 24-25, 2009.

- Invited talk: *Stochastic and deterministic two-patch models with Allee effect*, First Joint Meeting of the Society for Mathematical Biology and the Chinese Society for Mathematical Biology, Hangzhou, P.R. China, June 14-17, 2009.

- Invited talk: *Dynamics of plant-herbivore models with monotone plant growth rate*, AMS 2009 Spring Southeastern Section Meeting Raleigh, NC, April 4-5, 2009.

I.C.2-Contributed Talks/Poster Presentations Given in the National/International Conferences/Workshops or Attended Workshops:

- Poster: *Impacts of Climate Change on the Honeybee-Parasite System*, International Congress on Bee Sciences, Online Jun 16-18, 2022.

- Contributed talk: *Complex adaptive modeling framework to study task organization in social groups* in *Evolution of Complex Life*, Georgia Tech, Atlanta, May 15-17, 2019.

- Contributed talk: *Dynamical implications of bidirectional resources exchange between two ecosystems* in *The 2016 International Conference of the Resource Modeling Association*, Flagstaff, Arizona, June 14-17, 2016.

- Contributed talk: *Co-evolutionary dynamics of a host-parasite interaction model: obligate versus facultative social parasitism*, in the invited Mini-symposia on *Complex Adaptive and Evolutionary Models in Biology* in Mathematical Models in Ecology and Evolution (MMEE 2015), College of France, Paris, July 08-10, 2015.

- Poster: *Ecological and evolutionary dynamics of a two-stage model of social insects with egg cannibalism and division of labor* at *2Modeling and Sustainability of Biodiversity and Ecosystem Services*, University of Bordeaux , June 29 - July 1, 2015.

- Posters: *Co-evolutionary dynamics of a host-parasite interaction model: obligate versus facultative social parasitism* and *A two patch prey-predator model with adaptive dispersal strategies* at *Evolutionary Game Theory Workshop*, Mathematical Biological Institute, OSU, OH, April 27-May 01, 2015.

- Contributed talk: *Dynamics of intraguild predation models*, in the session *Populations, Metapopulations, and Dispersal* at *2013 AARMS Mathematical Biology Workshop*, Memorial University, St John's, Newfoundland, July 27-29, 2013.

- Poster: *Population dynamics of Intraguild Predation models with generalist or specialist predator*, SIAM conference on Life Sciences, San Diego, August 07-10, 2012.

- Workshop 2: *Circadian Clocks in Plants and Fungi*, Mathematical Biosciences Institute, Ohio State University, October 25-29, 2010.

- Contributed talk: *Dynamics of a discrete two-patch model on plant-insect interactions*, Mathfest 2010, Mathematical American Association, Pittsburgh, Pennsylvania, August 5-7, 2010.

- Poster: *Dynamics of a plant-herbivore model*, Workshop for Young Researchers in Mathematical Biology (WYRMB), Mathematical Biosciences Institute, Ohio State University, August 24-26, 2009.

- Contributed talk: *Dispersal effects of a plant-herbivore interaction two-patch models*, SIAM Conference on Control & Its Applications, Colorado Convention Center, Denver, Colorado, July 6-8, 2009.

I.C.3-Lectures/Posters/Seminars/Talks Given at ASU:

- Panel: *Why study social insects*, Social Insect Research Group, Arizona State University, September 07, 2022.

- Seminar talk: *Mathematical Modeling of Complex Adaptive Systems*, Mathematical Biology Seminar of School of Mathematical and Statistical Sciences, Arizona State University, Nov 20, 2020.

- Invited lecture: *Mathematical and theoretical biology institute*: *Continuous Time Models in Population Dynamics*, June 13, 2018.

- Invited lecture: *Mathematical Modeling of Complex Adaptive Systems*, Seminar of *the Fundamentals of Complex Adaptive System*, Arizona State University, Oct 23, 2017.

- Seminar talk: *Mathematical Modeling of Social Insects*, Research Seminar at Social Insects Research Group of School of Life Sciences, Arizona State University, December 05, 2015.

- Sabbatical talk: *Colony Collapse Disorder (CCD) of Honeybees: linking parasite infestations, diseases, and nutrient effects*, Applied Science Seminar of College of Letters and Sciences, Arizona State University, November 18, 2015.

- Invited lectures: Gave two lectures at *Mathematical and Theoretical Biology Institute*: *Ecological models*, June 08 and June 17, 2015.

- Seminar talk: *Colony Collapse Disorder (CCD) of Honeybees: linking parasite infestations, diseases, and nutrient effects*, Mathematical Biology Seminar of School of Mathematical and Statistical Sciences, Arizona State University, March 20, 2015.

- Invited lectures: Gave two lectures at *Mathematical and Theoretical Biology Institute*: *Ecological and evolutionary models for social insects*, June 30 and July 01, 2014.

- Seminar talk: *Mathematical Modeling in Biology and Epidemiology*, Science and Mathematics Seminar, Arizona State University, Sep 11, 2013.

- Invited lectures: Gave two lectures at *Mathematical and theoretical biology institute*: *Dynamics of Ecological and Epidemiology Models*, June 19 and 20, 2013.

- Workshop talk: *SI models with Allee effects and dispersal*, Workshop of MASpreading organized by Charles Perrings, Tempe, Arizona, Dec 13-14, 2012.

- Seminar talk: *Population dynamics of intraguild predations*, Mathematical Biology Seminar of School of Mathematical and Statistical Sciences, Arizona State University, October 19, 2012.

- Invited lectures: Gave two lectures at *Mathematical and theoretical biology institute*: *Population dynamics of Intraguild Predation* (June 14, 2012) and *Mathematical models with Positive density dependence* (June 15, 2012).

- Seminar talk: *Mathematical Modeling in Biology*, Applied Science Seminar of Department of Applied Sciences and Mathematics, Arizona State University, March 05, 2012.

- Seminar talk: *Relative permanence of discrete-time biological models*, Mathematical Biology Seminar of School of Mathematical and Statistical Sciences, Arizona State University, October 21, 2011.

- Invited lecture: *Population dynamics of one and two dimensional discrete time models* at *Mathematical and theoretical biology institute*, ASU, June 15 - 26, 2011.

- Invited lecture: *Interplay between Allee effects and competition'* at workshop III on *Heterogeneity and Ecologies* organized by *Mathematical, Computational & Modeling Sciences Center* (MCMSC), ASU, June 29, 2011.

- Seminar talk: *Relative nonlinearity and permanence*, Mathematical Biology Seminar of School of Mathematical and Statistical Sciences, Arizona State University, December 04, 2009.

I.C.4-Posters/Talks Given by Students/Postdocs Under My Supervision:

- Invited talk by Dr. Jun Chen, (JMM2025)

- X CISA Posters Fall 2024, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, Nov 13, 2024.

- Invited talk by : SACNAS National Diversity in STEM Conference (NDiSTEM), Phx, Arizona, Oct 30-Nov 2, 2024.

- Invited talk by Tamantha Pizarro: *Mathematical models of social insects* at The Eighth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA-IX) held at University of Wisconsin-Milwaukee, Oct 18-19, 2024.

- Invited talk by Carlos Bustamante-Orellana: *Modeling the Dynamics of Human Trust in Automation* at Cyberpsychology, Cybertheory & Social Networking Conference (CYPSY27), Omni Tempe Hotel at ASU, Tempe, AZ, United States, September 24-26, 2024.

- Invited talk by Carlos Bustamante-Orellana: *Modeling the Dynamics of Human Trust in Automation* at the Human Factors and Ergonomics Society (HFES) 68th Annual Meeting, PhX, Arizona, September 9-13, 2024.

- Invited talk by Dr. Jun Chen: Science on Tap, How Pesticides and Extreme Heat Are Threatening the Survival of Honey Bee Populations, Tempe, AZ, Aug 8, 2024.

- Invited talk by Dr. Jun Chen: Unveiling the Pesticides Threat and Seasonality for Honey Bee Populations Through Mathematical Modeling at 2024 SIAM Conference on Mathematics of Planet Earth, Portland, OR, June 10-12, 2024.

- Invited talk by Tamantha Pizarro: *Competition, Resource Dependency and Social Organization among Queen Ants Pogonomyremex californicus* at the SIAM Annul Meeting, Spokane, Washington, July 8-12, 2024.

- 2 CISA Posters Spring 2024, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, April 24, 2024.

- : Invited Seminar by Dr. Jun Chen: Mathematics Meets Biology: Modeling and Unveiling the Dynamics of Social Behavior and Environmental Interactions, Arizona State University, Tempe, AZ, Mar 28, 2024.
- Invited talk by Matthias Dogbatsey: *Mathematical Modeling of Gang Dynamics*, Joint Mathematical Meetings (JMM 2024), San Francisco, Jan 3-6, 2024.
- Invited talk by Theophilus Kwofie: *Mathematical Modeling Of Obesity Epidemic*, Joint Mathematical Meetings (JMM 2024), San Francisco, Jan 3-6, 2024.
- 7 CISA Posters Fall 2023, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, Nov 30, 2023.
- Invited talk by Tamantha Pizarro: *Dynamics of Cooperation Strategies: Impact of seasonality*, The 16th Annual Symposium on Biomathematics and Ecology Education and Research, at Virginia Commonwealth University on November 3-5, 2023
- Invited talk by Theophilus Kwofie: *Assessing the Impact of Intervention Programs on Gang Dynamics: A Mathematical Modeling Approach*, AMS Sectional Meeting at Cal State Fresno, May 6-7, 2023.
- 5 CISA Posters Spring 2023, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, April 26, 2023.
- Invited talk by aria Gabriela NAVAS ZULOAGA: *A mathematical study on the emergence of collective differences from individual variation: The complex adaptive dynamics of eusocial-insect colonies*, Bazhenov Research Group, University of California, San Diego, California, USA, November 30, 2022.
- 9 CISA Posters Fall 2022, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, Nov 30, 2022.
- Poster by Jordy Rodrigue-Rincon: *Dynamics on Plant-Pollination Models with Application toHoneybee*, International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems, Lafayette, LA,USA, October 28-30, 2022. https://tinyurl.com/ynwxy2ku
- Invited talk by Jun Chen: *How does seasonality and parasitism impact Honeybee population dynamics*, International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA-VIII), Lafayette, LA, Oct 28-30, 2022.
- Invited talk by Jordy Cevallos-Chavez: *Hierarchy Establishment fromNonlinear Social Interactions and Metabolic Costs: An Application to Harpegnathos saltator*, International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA-VIII), Lafayette, LA, Oct 28-30, 2022. https://tinyurl.com/ynwxy2ku
- Poster by Lucero Rodriguez: *Performance and Relative Risk Dynamics during Driving Simulation Tasks under Distinct Automation Conditions*, Human Factors and Ergonomics Society (HFES) 66th Annual Meeting, Atlanta, GA, Oct 10-14, 2022.

- Poster by Carlos Bustamante-Orellana: *The Impact of Automation Conditions on Reliance Dynamics and Decision-Making*, Human Factors and Ergonomics Society (HFES) 66th Annual Meeting, Atlanta, GA, Oct 10-14, 2022.
- Poster by Jun Chen: *Impacts of Pesticides on the Honeybee Population System*, International Congress on Bee Sciences, Online Jun 16-18, 2022.
- Poster by Lucero Rodriguez: *Dynamics of Trust in Automation and Interactive Decision Making during Driving Simulation Tasks*, 65th International Annual Meeting of the Human Factors and Ergonomics Society, Baltimore, MD, October 03-08, 2022.
- Invited talk by Lucero Rodriguez Rodriguez: *Communication dynamics of a dyad interaction model with applications to human-automation teaming*, Workshop on Modeling Population Dynamics in Ecology, Environment and Epidemiology, Fields Institute, Toronto, Ontario, Canada, 15-19 August, 2022.
- Invited talk by Gabriela Navas Zuloaga: *A social-insect model for flexible collective defense*, Workshop on Modeling Population Dynamics in Ecology, Environment and Epidemiology, Fields Institute, Toronto, Ontario, Canada, 15-19 August, 2022.
- Invited talk by Carlos Bustamante-Orellana: *Towards a Mathematical Model ForHuman Reliance and Trust in Automation*, Society for Industrial and Applied Mathematics (SIAM) Annual Meeting (AN22), Pittsburgh, PA, July 11-15, 2022.
- Invited talk by Gabriela Navas Zuloag: *From individual phenotypes to collective behavior in honeybee foragers*, IUSSI (International Union for the Study of Social Insects) Congress, San Diego, California, USA. July 3-7,2022. Available at https://youtu.be/Es0QN6jUVZg
- Poster by Jun Chen: *Modeling pesticide exposure on honeybee population dynamics with seasonality*, International Union for the Study of Social Insects (IUSSI2022),San Diego, CA, July 3-11, 2022
- 7 CISA Posters Spring 2022, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, April 27, 2022.
- Invited talk by Jun Chen: *Impacts of Climate Change on the Honeybee-Parasite System*, Bees in Winter: a workshop exploring climate change impacts on diapause physiology in wild and managed bees, Virtual, April 7, 2022
- Invited talk by Gabriela Navas Zuloag: *Modeling flexible collective defense: crisis response in social-insect colonies*, Joint Mathematics Meeting 2022, Virtual, April 3-9, 2022.
- 8 CISA Posters Fall 2021, College of Integrative Sciences and Arts Showcase, Arizona State University, Mesa, AZ, Dec 01, 2021.
- Invited talk by Lucero Rodriguez Rodriguez: *The harvesting effect of PacificYew for cancer treatment on the ecosystem: Mathematical modeling approach*, The 4th Annual Meeting of the SIAM Texas-Louisiana Section, SouthPadre Island, TX, 7 November, 2021.

- Poster by Lucero Rodriguez: *Dynamics of Trust in Automation and Interactive Decision Making during Driving Simulation Tasks*, 65th International Annual Meeting of the Human Factors and Ergonomics Society, Baltimore, MD, October 03-08, 2021.

- Poster by Lucero Rodriguez: *Mathematical Modeling of Humans and Autonomous Agents Interaction Dynamics*, Society for Chaos Theory in Psychology & Life Sciences 31st Annual International Conference, Online, July 22-24, 2021.

- Talk by Maria Gabriela Navas Zuloaga: *From Individual Phenotypes to Collective Behavior in Honeybee Foragers: A Mathematical Model.* The 2021Virtual Annual Meeting and Conference of the Society for Mathematical Biology (SMB), June 13-17, 2021

- Talk by Xiaohui Guo: *A mechanistic model for collective alarm response in social ant colonies". The 4th International Symposium on Swarm Behavior and Bio-inspired Robotics*, June 1-4, 2021.

- Talk by Xiaohui Guo: *Behind the alarm propagation: roles of individual differences and task cues in seed harvester ants.* The 57th Annual Conference of the Animal Behavior Society, Virtual Meeting, July 28-31, 2020.

- Talk by Maria Gabriela Navas Zuloaga: *A Mathematical Model of Flexible Collective Defense: Crisis Response in Stingless Bees*, The International Symposium on Biomathematics and Ecology: Education and Research, November 13-15, 2020 (Virtually).

- Poster by Colin M. Lynch: *Testing the Inefficient Task Stimulus Hypothesis: A Simple Computational Model for Hypometric Scaling of Metabolism in Social Insects*, The International Symposium on Biomathematics and Ecology: Education and Research, November 13-15, 2020 (Virtually).

- Invited Talk by Tao Feng: *Dynamics of task allocation of social insect colonies* in *The Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA VII), Oct 12-14, Tempe, AZ, 2019.

- Invited Talk by Jun Chen: *A honeybee population model with stage structure and seasonality* in *The Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA VII), Oct 12-14, Tempe, AZ, 2019.

- Poster by Jun Chen: *A Time-Delayed Model of Apis Mellifera* in The International Symposium on Biomathematics and Ecology: Education and Research, Arizona State University, Tempe, AZ, Oct 5-7, 2018.

- Poster by Michael Lin: *Group Level Alarm Response Catalyzed by Single Alarmed Ants* in The International Symposium on Biomathematics and Ecology: Education and Research, Arizona State University, Tempe, AZ, Oct 5-7, 2018.

- Poster by Jun Chen: *Social Network Models of Task Switching in Social Insect Colonies: Effects of Social Interactions and Spatial Heterogeneity* in the Sixth International Conference

on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VI), University of Arizona, Tucson, AZ, October 20-22, 2017.

- Presentation by Marisabel Rodriguez: *Population and Vitellogenin Dynamics of a Honeybees Colony Influencing Division of Labor* in the Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VI), University of Arizona, Tucson, AZ, October 20-22, 2017.

- Presentation by Komi Messan: *Population Dynamics of the Honeybee-mite Interactions* in the Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VI), University of Arizona, Tucson, AZ, October 20-22, 2017.

- Poster by Armando Salinas: *Influence of brood deaths on Honey Bee population dynamics and the potential impact of insecticides* in the Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA VI), University of Arizona, Tucson, AZ, October 20-22, 2017.

- Presentation by Jun Chen: *Social Network Models of Task Switching in Social Insect Colonies: Effects of Social Interactions and Spatial Heterogeneity* in the International Symposium on Biomathematics and Ecology Education and Research (BEER 2017), Illinois state university, Bloomington, October 6-8, 2017.

- Presentation by Armando Salinas: *Hierarchy Establishment from Nonlinear Social Interactions and Metabolic Costs: an Application to the Harpegnathos saltator* in the International Symposium on Biomathematics and Ecology Education and Research (BEER 2017), Normal, IL, October 6-8, 2017.

- Presentation by Ben Pyenson: *Behavioral regulation of a hierarchy in a social insect colony* in Qubec Society for the Study of Biological Behavior, Montreal, Quebec, July 18 - 22, 2017.

- Presentation by Marisabel Rodriguez: *Population Dynamics of Honeybees: linking parasites, diseases, and nutritional effects*, Society for Mathematical Biology, Salt Lake City, UT, July 17-20, 2017.

- Poster by Ben Pyenson: *Bending until it breaks: plasticity of reproduction in the ant Harpegnathos saltator* in Animal Behavior Society Annual Meeting, University of Toronto Scarborough Campus, Canada, June 12-16, 2017.

- Presentation by Komi Messan: *A two-patch model of the Honeybee-mite Interactions* in the special session on *Differential Equations and Their Applications to Biology* at American Mathematical Society Sectional Meeting, Bloomington, Indiana, April 1-2, 2017.

- Poster presentation by Xiaohui Guo: *Does individual variation matter in spreading alarm signal on social network of seed harvester ants' colonies (Pogonomyrmex californicus)?* in *The 4th Workshop on Biological Distributed Algorithms*, Chicago, IL USA, July 25, 2016.

- Poster presentation by Micheal Lin: *Environmental and spatial heterogeneity's effects on information flow in ant colonies: An agent-based model study* in *The 4th Workshop on Biological Distributed Algorithms*, Chicago, IL USA, July 25, 2016.

- Invited talk by Marisabel Rodriguez: *Evolutionary dynamics of social insects with cannibalism and division of labor* in *The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (AIMS 2016), Orlando, Florida, U.S, July 01-05, 2016.

- Talk by Komi Messan: *Adaptive dispersals of a two-patch prey-predator* at *The 35th Southeastern Atlantic Regional Conference on Differential Equations*, The University of North Carlonina at Greensboro, Greensboro, NC, Oct 10-11, 2015.

- Poster by Marisabel Rodriguez: *Evolutionary dynamics of social insects with cannibalism and division of labor* and
  Talk by Marisabel Rodriguez: *Honeybee disease dynamics and colony collapse disorder* at a special session on *Complex Biological Systems* of *The 8th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2015), Illinois State University, Normal, IL, October 09-11, 2015.

- Poster by Talia Davies: *Mathematical Modeling of Honeybee disease and parasites*, at *The 8th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2015), Illinois State University, Normal, IL, October 09-11, 2015.

- Poster by Marisabel Rodriguez: *Ecological and evolutionary dynamics of a two-stage model for social insects* at *The International Society for Evolution, Medicine & Public Health*, Arizona State University, Tempe, AZ, March 19-21, 2015.

- Poster by Xiaohui Guo: *Dynamics of information spreading, the colony size and spatial heterogeneity* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, Oct 10-12, 2014.

- Poster by Komi Messan: *Two-patch prey-predator model with dispersal in predator due to self-organizations* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, Oct 10-12, 2014.

- Poster by Marisabel Rodriguez: *Ecological and evolutionary dynamics of a two-stage model of social insects with egg cannibalism and division of labor* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, Oct 10-12, 2014.

- Poster by Oyita Udiani: *Division of labor of social ants* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, Oct 10-12, 2014.

- Poster by Jose Valenzuela: *Social interactions in ant colonies with different task status* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research-2014*, Claremont Colleges, Claremont, CA, Oct 10-12, 2014.

- Contributed talk by Oyita Udiani: *The dynamics of foraging activity in Harvester ants*, in a contributed session (CP13) on *Ecology and Evolution* at *SIAM Conference on the Life Sciences*, Sheraton Charlotte, Charlotte, North Carolina, August 04-07, 2014.

- Poster by Jose Valenzuela: *Social interactions in ant colonies with different task status* in MAA MathFest, Portland, Oregon, August 06-09, 2014.

- Poster by Marisabel Rodriguez: *Ecological and evolutionary dynamics of a two-stage model of social insects with egg cannibalism and division of labor* in *the 1st International & Interdisciplinary Workshop on the Ecology, Evolution and Dynamics of Dengue and other Related Disease*, Arizona State University, Tempe, August 04-05, 2014.

- Poster by Komi Messan: *Two-patch prey-predator model with dispersal in predator due to self-organizations* in *the 1st International & Interdisciplinary Workshop on the Ecology, Evolution and Dynamics of Dengue and other Related Disease*, Arizona State University, Tempe, August 04-05, 2014.

- Poster by Sourav Kumar Sasmal: *on Allee effects in Eco-epidemiological systems* in *the 1st International & Interdisciplinary Workshop on the Ecology, Evolution and Dynamics of Dengue and other Related Disease*, Arizona State University, Tempe, August 04-05, 2014.

- Invited talk given by John McKay: *Network dynamics of social ants* in the special session of *Complex Systems of Social Insects* at *The 6th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2013), Marymount University, Arlington, VA, October 11-13, 2013.

- Invited talk given by Oyita Udiani: *Mathematical modeling of foraging ants* in the special session of *Complex Systems of Social Insects* at *The 6th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2013), Marymount University, Arlington, VA, October 11-13, 2013.

- Invited talk given by Sourav Kumar Sasmal: *Dynamics of prey-predator models with Allee effects and disease in prey* in the special session of *Recent Advances in Mathematical Epidemiology and Ecology* at *The Fourth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA IV), Texas Tech University in Lubbock, Texas, October 4-6, 2013.

- Invited talk given by Oyita Udiani: *Co-evolutionary dynamics of a prey-predator model* in the special session of *Evolutionary Modeling in Ecology* at *The Fourth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA IV), Texas Tech University in Lubbock, Texas, October 4-6, 2013.

- Contributed talk *Modeling minority group influence on larger community behavior: measles vaccine refusal and ant networks as examples* given by John McKay in the session *POPULATION DYNAMICS* at *2013 AARMS Mathematical Biology Workshop*, Memorial University, St John's, Newfoundland, July 27-29, 2013.

- Poster presented by John McKay: *Multi-scale dynamical network of social insects (Pogonomyrmex californicus) and their labor division*,*The Society for Mathematical Biology Annual Meeting and Conference*, Tempe, Arizona, June 10-13, 2013.

- Poster presented by Oyita Udiani: *Eco-evolutionary dynamics of a Predator-Prey System with Generalist Predation & Type II Functional Response*, *The Society for Mathematical Biology Annual Meeting and Conference*, Tempe, Arizona, June 10-13, 2013.

- Poster presented by Lauren Wedekin: *Modeling Framework of Intraguild Predation*, Showcase at *College of Technology & Innovation*, Arizona State University, April 25, 2012.

- Poster presented by Lauren Wedekin: *Mathematical Models of Intraguild Predation in Ecology*, *The Third International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA III), Trinity University, San Antonio, Texas, October 7-9, 2011.

II. Instructional Activities

The Polytechnic campus of ASU primarily serves undergraduate commuters who have extremely diverse backgrounds. As the only faculty in Applied Mathematics, I have worked with other faculty to develop Major and Minor in *Applied Mathematics* in Fall 2016, Fall 2017, respectively. Our applied mathematics program has been thriving. In addition to build new undergraduate programs of Applied Mathematics, I have been able to successfully integrate my research into education by developing graduate course (**ABS 560-Ecological Modeling**) that has become a popular course for the Master's Degree Program of Applied Biological Sciences (ABS) but also other graduate programs at ASU. I also developed/implemented three new undergraduate courses: **MAT 494 Introduction to Complex Adaptive Systems** that has been taught since Fall 2018, **MAT 394 Mathematical Methods and Data** that has been taught since Spring 2020, and **MAT 350 Techniques and Applications of Applied Mathematics** that has been taught since Fall 2021. These three undergraduate courses serve as a main upper division course in Applied Math program for undergraduates.

II.A. Teaching activities at the Polytechnic Campus of ASU:

I maintain an active and fun learning environment with an emphasis on understanding, valuing and leveraging student differences, even though lower-division mathematical courses have a reputation for being difficult to teach due to the diverse backgrounds and the different interests/strengths of our students. I engage students in **active learning** by having personal contacts (e.g., individual meeting with me to discuss about their math background such as their strength and weakness in math), relating mathematical concepts to the daily life to retain students interests and motivations in learning (e.g., final projects related to model real world problems), providing credits for writing a **Math Essay** to reflect on their own study, implementing technology in class (e.g., calculus on-line

animations, Peanut Software, Matlab), and using the **problem-oriented approach** to encourage dynamic intellectual interaction and enable students to learn from the world around them. To examine the effectiveness of my teaching and students' learning, I have administered the **Calculus Concept Inventory** Test in my classes. This begins the process of developing baseline student performance data against which future instructional reforms may be measured; this educational research was funded by NSF grants to recognize, assess, and enhance Evidence-Based Instructional Practices in STEM at the Polytechnic campus of ASU.

I have actively mentored both undergraduate and graduate students from different disciplinary units such as biology, engineering and mathematics, to carry out research projects through research classes such as *Undergraduate Research* (ABS 489/499; IDS 401), *Reading and Conference* (ABS/AML 590), *Graduate Research* (ABS 592;AML/APM 792), *Thesis/Dissertation* (MAT 493; MAT 495; ABS 599; AML/APM 799). My long-term work with *Simon A Levin Mathematical, Computational & Modeling Sciences Center*, *Social Insect Research Group*, and *School of Mathematical and Statistical Sciences* provide great opportunities and platforms to work with diverse students, especially minorities, at the interface of Applied Mathematics and Life Sciences.

II.A.3 Courses Taught at the Polytechnic Campus of ASU:

- Fall 2024: **MAT 265**, **MAT 494** An introduction to Complex Adaptive Systems, and seven independent research/thesis classes including **MAT 495; AML 590/592; AML 792; AML 799**.
- Spring 2024: **MAT 265**, and seven independent research/thesis classes including **MAT 495; AML 590/592; AML 792; AML 799**.
- Fall, 2023: **MAT 350** Techniques and Applications of Applied Mathematics and **MAT 494** An introduction to Complex Adaptive Systems; Seven independent research/thesis classes including **MAT 499; AML 590/592; AML 792; AML 799**.
- Spring, 2023: **MAT 494/ ABS 560 Ecological Modeling**; and Eight independent research/thesis classes including **MAT 495; AML 590/592; AML 792; AML 799**.
- Fall, 2022: **MAT 350** Techniques and Applications of Applied Mathematics and **MAT 494** An introduction to Complex Adaptive Systems; Seven independent research/thesis classes including **AML 590/592; AML 792; AML 799**.
- Spring, 2022: sabbatical. Eight independent research/thesis classes including **MAT 495; AML 590/592; AML 792; AML 799**.
- Fall, 2021: **MAT 350** Techniques and Applications of Applied Mathematics and **MAT 494** An introduction to Complex Adaptive Systems; Seven independent research/thesis classes including **AML 590/592; AML 792; AML 799**.
- Spring, 2021: **MAT 394 Mathematical Methods and Data**; **MAT 494/ ABS 560 Ecological Modeling**; and Eight independent research/thesis classes including **MAT 495; AML 590/592; AML 792; AML 799**.

- Fall, 2020: eight independent research/thesis classes including **MAT 495; AML 590/592; AML 792; AML 799**.
- Spring, 2020: **MAT 394 Mathematical Methods and Data**; **MAT 494/ ABS 560 Ecological Modeling**; and six independent research/thesis classes including **IDS 401; MAT 495; AML 590/592; AML 792; AML 799**.
- Fall, 2019: **MAT 494** An introduction to Complex Adaptive Systems, and five independent research/thesis classes including **AML 590/592; AML/APM 792; AML 792/799**.
- Spring, 2019: **MAT 494/ ABS 560 Ecological Modeling**; and five independent research/thesis classes including **BIO/MAT 495; AML 590/592; APM 792; AML 799**.
- Fall, 2018: **MAT 494** An introduction to Complex Adaptive Systems, and eight independent research/thesis classes including **MAT 492/493; AML 590/592; AML/APM 792; AML 792/799**.
- Spring, 2018: The graduate course with lab **ABS 560 Ecological Modeling**; and seven independent research/thesis classes including **BIO/MAT 493; AML 590/592; APM 792; AML 799**.
- Fall, 2017: **MAT 265** Calculus for Engineers I, and eight independent research/thesis classes including **BIO 492; MAT 492/493; AML 590/592; AML/APM 792; AML 799**.
- Spring, 2017: The graduate course with lab **ABS 560 Ecological Modeling**; and five independent research/thesis classes including **MAT 499; AML 590/592; APM 792; AML 799**.
- Fall, 2016: **MAT 265** Calculus for Engineers I, and eight independent research/thesis classes including **BIO 492; MAT 492/493; AML 590/592; AML/APM 792; AML 799**.
- Spring, 2016: **MAT 265** Calculus for Engineers I; the graduate course with lab **ABS 560 Ecological Modeling**; and directed research **BIS 401(1), AML 590 (2), AML 792 (1), AML 799 (1), APM 792 (2)**.
- Fall, 2015: **MAT 265** Calculus for Engineers I (two sections), and six independent research/thesis classes including **ABS 499; MAT 492; AML 590/592; AML/APM 792**.
- Summer, 2015: Graduate Research **APM 792**
- Fall, 2014: **MAT 265** Calculus for Engineers I, the graduate seminar **ABS 691**, and six independent research classes.
- Summer, 2014: The graduate research **AML 792**.
- Spring, 2014: The graduate course **ABS 560 Ecological Modeling** and the graduate seminar **ABS 591**.
- Fall, 2013: **MAT 265** Calculus for Engineers I and the graduate research **AML 792**.
- Spring, 2013: **MAT 265** Calculus for Engineers I, the graduate course **ABS 560 Ecological Modeling** and **ABS 592** Research.

- Fall, 2012: **MAT 265** Calculus for Engineers I (two sections).
- Summer, 2012: **ABS 590** Reading and Conference and **ABS 489** Undergraduate Research.
- Spring, 2012: **MAT 265** Calculus for Engineers I, the graduate course **ABS 560 Ecological Modeling**, **ABS 590** Reading and Conference, **ABS 592** Research and **ABS 599** Thesis.
- Fall, 2011: **MAT 265** Calculus for Engineers I, **MAT 275** Modern Differential Equations and **ABS 599** Thesis.
- Summer, 2011: **ABS 590** Reading and Conference and **ABS 599** Thesis.
- Spring, 2011: **MAT 265** Calculus for Engineers I, the graduate course **ABS 560 Ecological Modeling**, **ABS 592** Research and **ABS 599** Thesis.
- Summer, 2011: **ABS 590** Reading and Conference and **ABS 599** Thesis
- Spring, 2011: **MAT 265** Calculus for Engineers I, **ABS 590** Reading and Conference and **ABS 599** Thesis and a new graduate course **ABS 560 Ecological Modeling**.
- Fall, 2010: **MAT 265** Calculus for Engineers I, **MAT 275** Modern Differential Equations and **ABS 489** Undergraduate Research.
- Spring, 2010: **MAT 265** Calculus for Engineers I (two sections).
- Fall, 2009: **MAT 210** Brief Calculus (two sections), **ABS 489** Undergraduate Research.
- Spring, 2009: **APM 265** Mathematics of Change I (two sections)

II.B. Graduate/Undergraduate Students Mentoring:

II.B.1-Graduate Students Mentoring:

II.B.1.1-PhD Students Graduated (where I served as Chair or Co-Chair):

* Sourav Kumar Sasmal obtained his PhD in May 2015 from the Indian Statistical Institute, Kolkata. I **co-chair his PhD Committee** (co-supervise with Professor Joydev Chattopadhyay). Sourav's PhD thesis was *Mathematical Studies on Allee Effect in Interactive Population*. We have four co-author papers. Dr. Sasmal was doing his research fellowship under Professor Yasuhiro Takeuchi at Aoyama Gakuin University, Japan. Sourave is an Assistant Professor of Department of Mathematics, Birla Institute of Technology and Science, Pilani.

* Oyita Udiani obtained his PhD in December 2016 from *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe. Oyita's PhD Thesis was *A Mathematical Study of Social Dynamics And Its Consequences for Task Organization in Animal Groups*. Oyita obtained NSF postdoctoral fellowship and joined NIMBIOS in Spring 2017. Now Oyita is an Assistant Professor of Department of Mathematics and Applied Mathematics, Virginia Commonwealth University.

* Komi Messan obtained his PhD in December 2017 from AMLSS at ASU, Tempe. Komi's PhD Thesis was *Prey-predator "Host-parasite" Models with Adaptive Dispersal: Application to Social Animals*. Komi started his job as Research Mathematician with the *Cold Regions Research and Engineering Laboratory of the US Army Engineer Research and Development Center* starting January 2018.

* Baltazar Espinoza Cortes obtained his PhD in Spring 2018 from AMLSS at ASU, Tempe. His PhD Thesis was *Consequences of short-term mobility across heterogeneous risk environments: the 2014 West African outbreak* (Co-chair with Dr. Carlos Castillo-Chavez). He was a Postdoc of *Simon A Levin Mathematical, Computational & Modeling Sciences Center*, ASU. Now he is a Postdoctoral Research Associate at Biocomplexity Institute & Initiative, University of Virginia

* Marisabel Rodriguez obtained her PhD in Summer 2018 from *Applied Mathematics PhD Program* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe. Her PhD Thesis was *Understanding the Emerging Behaviors and Demands for the Colony Success of Social Insects: A Mathematical Approach*. She will start her Postdoc position at Mathematics Department of *Dartmouth College* in Fall 2018.

* Jordan Bates obtained his PhD in Summer 2019 from AMLSS at ASU, Tempe. His PhD Thesis was *Measurement, Inference, and Simulation of Student Social Dynamics* (Co-chair with Dr. Maroulis Spiro). He is currently a data scientist.

* Xiaohui Guo obtained his PhD in Summer 2021 from SOLS at ASU, Tempe. His PhD Thesis was *From alarm propagation to energy metabolism: mechanisms of collective colony responses in seed-harvester ant, Pogonomyrmex californicus* (Co-chair with Dr. Jen Fewll). He is currently a postdoc at Isral.

* Maria Gabriela NAVAS ZULOAGA obtained her PhD in December 2022 from AMLSS at ASU, Tempe. Her PhD Thesis was *A mathematical study on the emergence of collective differences from individual variation: The complex adaptive dynamics of eusocial-insect colonies* (Co-chair with Dr. Brian Smith). She is currently a postdoc at Bazhenov Research Group, University of California, San Diego.

* Jun Chen successfully defended her PhD in October 2023 from AMLSS at ASU, Tempe. Her PhD Thesis is *Mathematical Modeling of Social Insect Colonies as Complex Adaptive Systems*. She is currently a postdoc at School of Life Sciences at ASU.

II.B.1.2-Current Graduate Students Under my Supervision:

* Jordy Oswaldo RODRIGUEZ RINCON is a fourth year graduate student in AMLSS PhD program at ASU, Tempe. Jordy is exploring his PHD topic of plant-herbivore interaction dynamics.

* Tamantha Pizarro is a third year graduate student in AMLSS PhD program at ASU, Tempe. Tammy is interested in developing multiscale mathematical models to integrate social dynamics into evolution cooperation.

* Lucero Rodriguez is a fifth year graduate student in AMLSS PhD program at ASU, Tempe. Lucero has been working with me on mathematical modeling of social interactions and cooperation in team dynamics.

* Carlos Bustamante Orellana is a fifth year graduate student in AMLSS PhD program at ASU, Tempe. Carlos is interested in applying both ODE and machine learning tools to explore disease dynamics, trust dynamics, and team collaborations.

* Jordy Jose Cevallos Chavez is a third year graduate student in AMLSS PhD program at ASU, Tempe. Jordy is exploring his PHD research topic.

* Theophilus Kwofie is a third year graduate student in Applied Mathematics PhD program at ASU, Tempe. Theo has been working with me on mathematical modeling of gang dynamics.

* Anan Albalawi is a second year graduate student in AMLSS PhD program at ASU, Tempe. She has been exploring her dissertation topics on mathematical modeling of social insects.

II.B.1.3-Master Students Graduated (where I served as Chair):

* Lauren Wedekin (2010-2012): Lauren graduated in August 2012 with her M.S. degree of *Applied Biological Sciences* at ASU, Polytechnic. I chaired her **M.S. Committee**. Lauren's thesis is *Mathematical Modeling of Intraguild Predation and its Dynamics in Ecology.* She is a co-author of the published article *Dynamics of a intraguild predation model with generalist or specialist predator* (see Section **I.A.1** for details).

* John McKay (2012-2014): John obtained his Master in Pass in AMLSS due to his exceptional work on *Social network of harvest ants.* His master thesis topic is motif analysis and communication dynamics of social ants. He is currently a PH.D student in the Electrical Engineering program at Penn State.

* Krystal Blanco (2014-2016): Krystal obtained her Master in Pass in AMLSS on the project *Disease Dynamics of Social Animals.* The related project on the honeybee disease work has been published in the journal of *Mathematical Biosciences.* Krystal is an analyst at Salt River Project, Phx, AZ.

* Lorenzo Tapia (2014-2016): Lorenzo obtained his Master in Pass in AMLSS on the project *Dynamic Effects of Biocontrol Beetle on the Virgin River Ecosystem.* We published a paper on the topic with collaboration with Dr. Heather Bateman. Lorenzo is an Informatics Analyst I at Health Services Advisory Group, Inc. (HSAG).

* Jennifer Rodriguez (2015-2017): Jennifer obtained his Master in Pass in AMLSS due to her exceptional work on *the evolutionary models of social insects.*

* Armando Salinas (2016-2018): Armando will obtain his Master in Pass in AMLSS in Spring 2018 from his work on mathematical modeling of nonlinear hierarchy social structure in social insect colonies.

* Jun Chen (2016-2018): Jun obtained her Master in Pass in AMLSS in Spring 2018 from her work mathematical modeling of social network structure (including task switching) in social insect colonies.

* Juan Melendez-Alvarez (2017-2019): Juan obtained his Master in Pass in AMLSS in Summer 2019 from his work on mathematical modeling of disease.

* Maria Gabriela NAVAS ZULOAGA (2019-2020): Gabriela obtained her Master in Pass in AMLSS in Spring 2020 from her work on *Modeling Distributed Cognitive Systems*.

* Lucero Rodriguez Rodriguez (2019-2021): Lucero obtained her Master in Pass in AMLSS in Spring 2021 from her work on *Mathematical Modeling of Humans and Autonomous agents interaction dynamics*.

* Carlos Bustamante Orellana (2020-2021): Carlos obtained his Master in Pass in AMLSS in Spring 2021 from his work on *Modeling COVID19 with Spatial Components*.

* Jordy Jose Cevallos Chavez (2020-2021): Jordy obtained his Master in Pass in AMLSS in Spring 2021 from his work on *The Impact of Mobility on The Dynamics of COVID-19 Outbreak in Provinces of Ecuador*.

* Jordy Rodriguez (2020-2023): Jordy obtained his Master in Pass in AMLSS in Spring 2023 from his work on *Dynamical Models of Plant-Pollinator Interactions with Application to Honey bee*.

* Tamantha Pizarro (2021-2023): Tammy obtained her Master in Pass in AMLSS in Spring 2023 from her work on *A Mathematical Model of Cooperative Nest Founding by queen harvester ant Pogonomyremex californicus*.

II.B.1.4-Completed PhD Thesis Committees:

* September 2024: Colin Lynch successfully defended his dissertation *Behavioral underpinnings of hypometric metabolic scaling in the harvester ant Pogonomyrmex californicus* for his PhD degree in *Animal Behavior* of School of Life Sciences (SoLS) at ASU, Tempe.

* April 2024: Brooke Anderson successfully defended her dissertation *Using Satellite Tagging Technologies to Improve Management and Conservation of the Northwest Atlantic Porbeagle Shark Lamna nasus* for her PhD degree from School of Life Sciences (SoLS) at ASU, Tempe.

* April 2023: Salman Safdar successfully defended his dissertation *Mathematics of SARS-CoV-2 pandemic* for his Phd degree *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

* May 2022: Benjamin Pyenson successfully defended his dissertation *Caste-Specific and Social Determinants of Dominance Behavior in a Ponerine Ant* for his PhD degree in *Animal Behavior* of School of Life Sciences (SoLS) at ASU, Tempe.

* May 2020: Elpiniki Nikolopoulou successfully defended her dissertation *Mathematical Modeling of Novel Cancer Immuno-therapies* for her PhD degree in *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

* April 2020: Enahoro Iboi successfully defended his dissertation *Mathematical Assessment of Control Measures Against Mosquito-borne Diseases* for his PhD degree in *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

* March 2020: Cesar Paul Montalvo Clavijo successfully defended his PhD dissertation *Understanding the impact of social factors on the transmission of dynamics of infectious diseases across highly heterogeneous environments* in March 2020 in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe.

* May 2018: Victor Moreno Martinez successfully defended his PhD dissertation *Understanding the impact of social factors on the transmission of dynamics of infectious diseases across highly heterogeneous environments* in March 2018 in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe. He is currently a Postdoc of *Simon A Levin Mathematical, Computational & Modeling Sciences Center*.

* July 2017: Fereshteh Nazari successfully defended her PhD dissertation *Mathematical Model for IL-6-Mediated Tumor Growth, Invasion, and Targeted Treatment* in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe.

* July 2017: Miles Manning successfully defended his PhD dissertation *Patterns in Knowledge Production* in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe.

* April 2016: Stephen Evilsizor successfully defended his dissertation *Evolutionary Games as Interacting Particle Systems* for his PhD degree in *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

* April 2016: Ilyssa Summer successfully defended her dissertation *Oncolytic Viral and Immunotherapy Models Combined with Strategies to Ameliorate Cancer Burden* for her PhD degree in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe.

* May 2014: Maytee Cruz-Aponte successfully defended her dissertation *Effect of External Factors on Epidemics Dynamics* for her PhD degree in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe. Maytee is an assistant professor at University of Puerto Rico.

* May 2014: Emmanuel Morales has been graduated from *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe. Emmanuel's PhD thesis is *The implications*

of different probability density functions for disease stages in deterministic compartmental epidemiological models on the decisions and effectiveness of public health interventions.

* August 2014: Angie Peace successfully defended her dissertation *Stoichiometric Producer-Grazer Models Incorporating the Effects of Excess Food-Nutrient Content on Grazer Dynamics* for her PhD degree in *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

* November 2014: Yunqin Zhao successfully defended her dissertation *Mathematical and Statistical Insights in Evaluating State Dependent Effectiveness of HIV Prevention Interventions* for her PhD degree in *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

* November 2014: Aaron Parker successfully defended his dissertation *Cell Quota Based Population Models and their Applications* for his PhD degree in *Applied Mathematics* of School of Mathematical & Statistical Sciences (SoMSS) at ASU, Tempe.

II.B.1.5-Current PhD Thesis Committees:

- Dalia Cabada is third-year PhD Student in Applied Mathematics at the mathematical department of Tempe, ASU.

- Christopher Lieber is a fourth year Phd student working on *Quality and Quantity of Communication for wildland firefighters under high stress situations* of The Polytechnic School at Ira A. Fulton Schools of Engineering.

- Beckah Campbell is a fourth year PhD student in *Environmental Life Sciences* of School of Life Sciences (SoLS) at ASU, Tempe.

II.B.1.6-Completed Master Thesis Committee:

* Carlos Cruz defended in May 2019 from *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe.

* Baltazar Espinoza Cortes defended in May 2016 from *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe.

* Kimberly Jones defended in July 2015 from *School of Mathematical & Statistical Sciences* (SoMSS) at ASU, Tempe.

* Ilyssa Summer graduated in May 2012 from *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe. She is a current PhD student in AMLSS.

II.B.1.7-Research Projects Directed (that can lead to publications):

II.B.1.7.1-Current Research Projects:

* DIVYA. G (2021-current): She is a third year PhD student from India. Her current research project is to apply mathematical modeling in epidemiology to social behavior problems.

II.B.1.7.2-Completed Research Projects that have led to publications:

* Benjamin Pyenson (2016 –2022): He has been working with me on two research projects related to modeling and experiments of social insects: (a) Dynamical Reproduction Ratio in a Shared Hierarchy Social Insect Colonies; (b) What Unique Behaviors Do the *Harpegnathos saltator* Possess That Leads to the Development of Shared Hierarchical Structures.

* Michael Lin (2015 –2020) was a PhD student in *Applied Mathematics for the Life and Social Sciences* (AMLSS) at ASU, Tempe. I was mentoring his research projects on spatial-temporal stochastic models with applications to social insects.

* Darin Kopp (2016 –2017): He was a second year PhD student of *School of Life Sciences* (SOLS) at ASU, Tempe. His research project is to study *Dynamical Outcomes of Resource Exchanges between Two Metaecosystems*. The related work has been published in *Mathematical Biosciences*. Darin was a PhD student in the Ecology and Evolutionary Biology program at University of Oklahoma. He is an ORISE Postdoctoral Participant at USEPA.

* Riley Burnette (2013 –2016): Riley obtained her master thesis on *Applied Biological Sciences* at ASU, Polytechnic. I mentored her research project on *Seasonality and Land Cover Type Drive Aphid Dynamics in an Arid City* with Dr. Heather Bateman. She got her PhD at ASU in 2020.

* Amiya Bhowmick (2011-2012): He is a fourth year PhD student of the Indian Statistical Institute, Kolkata. I have been mentoring him on the project of *Disease Models subject to Allee Effects*. He is a co-author of our two submitted manuscripts *Dynamics of a predator-prey system with prey subject to Allee effects and disease* and *Host-Parasitoid systems with predation-driven Allee effects in host population*, respectively (see Section **I.A.2** for details). He is an Assistant Professor at Department of Mathematics, Institute of Chemical Technology, Mumbai.

* Rebecca Clark (2009-2011): She was a PhD student in School of Life Sciences at ASU, Tempe. I worked with her on mathematical modeling of leaf-cutter ants and fungus which led to a publication in *Journal of Theoretical Biology* (2011, see Section **I.A.1** for details). Rebecca was currently a Postdoctoral Research Associate in the University of California, Berkeley. And she is an assistant professor at Biology Department, Siena College, Loudonville, NY 12211.

II.B.2-Undergraduate Students Mentoring:

II.B.2.1-Current Honor Thesis Students:

•

II.B.2.2-Completed Honor Thesis Students:

* Spring 2023: Anika Reveles successfully defended her honor thesis *Modeling Colony-Level Effects of Seasonality & Pesticides on Honey bee Population Dynamics* on April 21, 2023.

* Spring 2019: Brian Sweeney successfully defended his honor thesis *Mathematical Modeling of Honeybee Population Dynamics* on April 05 2019. He will attend graduate school starting Fall 2019.

* Summer 2018: Fatima Barat Ali is a fourth year Barrett the Honors College student majoring in Biology. She successfully defended her honor thesis on the data collection of *Worker Policing in Ponerine Ant Species* in May 2018. She will attend Medical School after her graduation from ASU.

* Summer 2018: Jeffrey Chien is a fourth year Barrett the Honors College student majoring in Engineers. He defended his honor thesis on the analysis and modeling part of *Worker Policing in Ponerine Ant Species* in May 2018. Jeffrey plans to attend graduate school after his graduation from ASU.

* Fall 2017: Alejandra Mayoral defended her honor thesis on *Analysis of Egg-Laying Rates of Harpegnathos Saltator Through Different Methods of Observation.* Alejandra is going to be getting a Master's Degree in Mathematics Education at Northern Arizona University.

* Fall 2016: Katherine Kincade defended her honor thesis on mathematical modeling of division of labor of foundrass association of ant queens. She currently works in *Cryptanalytic Computer Network Operations Development Program* at NSA.

* Fall 2015: Talia Davis defended her honor thesis on disease dynamics of honeybees, and graduated from Barrett the Honors College in mathematics. She is a graduate student in the graduate program of *Applied Behavior Analysis* in Psychology Department at ASU.

II.B.2.3-Current Honor Thesis Committee Member of Undergraduate:

* Spring 2024-Current: Zachary Grabill and Phoenix Pulver are senior undergraduate students in *Applied Biology.* Their honor thesis topic is *Testing Ecological Models in a Simulated Ecosystem (WIP).*

II.B.2.3-Completed Honor Thesis Committee Member of 7 Undergraduates:

* Alesandro Arcuri (2015, majoring in Economics and Mathematics at ASU, Tempe).

* Yili Yu (Thesis defended in 2013, majoring in both Marketing and Mathematics at ASU, Tempe).

* Austin Wehn (Thesis defended in 2013, majoring in both Computer Sciences and Mathematics at ASU, Tempe).

* Andrew Sannier (Thesis defended in 2012, majoring in both Computational Math Sciences and Political Sciences at ASU, Tempe).

* Kenneth Qian (Thesis defended in 2012, majoring in Statistics, Finance, Economics at ASU, Tempe).

* Jared Neufer (Thesis defended in 2011, majoring in both Mathematics and Political Sciences at ASU, Tempe).

* Jeremiah White (Thesis defended in 2011, majoring in both Engineering and Mathematics at ASU, Tempe & Polytechnic). Jeremiah is currently a graduate student in the University of Washington.

II.B.2.5-Research Projects Directed (Name in bold indicates that the research project has led to a publication):

II.B.2.5.1-Current Research Projects:

* Jeffrey Gallegos (2024-current): Jeffrey is a senior in undergraduate major in Applied Math from ASU Poly. He is interested in math modeling of liver diseases.

* Karma Liburd (2023-current): Karma is a senior in undergraduate major in Applied Math from ASU Poly. She is interested in math modeling of social problems such as Teen pregnancy.

* Yujiao Wang (2023-current): Her research project is to develop mathematical models for applications in sciences.

* Otis Lundahl (2023-current): His research interest is to model the dynamics of mental disorder in AZ.

II.B.2.5.2-Completed Research Projects:

* Samuel Perales (2021-2023) graduated in math from The University of Texas at Austin. Sam has been working with me on math modeling on spatial impacts of information flow in social insect colonies since the summer 2021.

* Dillon Max (2020- 2023) was a junior undergraduate major in both math and biology from University of Illinois Urbana-Champaign. He worked on math modeling of evolution cooperation of social insect colonies since May 2020.

* Karl Tilleman (2021-2023) was a junior undergraduate major in Applied Math from ASU Poly. He worked on modeling Covid-19 outbreak.

* Anika Reveles (2021-2023) was a junior undergraduate major in Applied Math from ASU West. She worked on math modeling of bees.

* Luke Sternberg (2021-2023) was a junior undergraduate major in Applied Math from ASU Poly. He worked on math modeling of healthcare delivery as a complex adaptive system.

* Johanna McCombs (2020-2023): Her research project is to explore how language shifts among three ethnolinguistic groups

* Michael Brady (2020-2021): His research project is to study how pandemic COVID19 impacts the mortgages of USA.

* Brian Martinicky (2020 Spring): His research project has been exploring mathematical modeling in life and social sciences.

* Tanner Dolby (2019 Spring-2020 Spring): His research project was to explore mathematical modeling in life and social sciences and built a research website.

* Charlotte Deming (2016-2019): Her research project is to do agent-based models of social insect colonies.

* James Agbay (2016-2019): His research project is to develop an adaptive model on social ants.

* McKenna Manning (2017 Fall): Her research project was to explore mathematical modeling in life and social sciences .

* Bradley Stiefel (2016): His research project was to develop an adaptive model on the foraging allocation due to nutrient constraints.

* Nghia Millard (2016): His research project was to do agent-based models of task switching in social insect colonies.

* Lauren Engel (2015): Her research project was to develop a agent-based model of evolution reproduction of harvest ants.

* Heather Lyons (Spring 2016): Her research project was to study *How Social Insect Colonies Prevent the Spread of Diseases.*

* Jose Valenzuela (2014-2016): His research interest was to develop an agent-based model of (1) prey-predator interactions with adaptive dispersal strategies in predator; and (2) Social network models of information flow in social ants colonies.

* **Jonny Woodbury** and **Tin Phan** (2015-2016): Their research project was to model the dynamics of leaf cutter ants and their fungus garden with division of labor and egg cannibalism. This project led to a submission that is under review.

* Alessandro Laspina (2015-2016): His research interest was to explore the application of social insects to engineer.

* Benjamin Krakoff (from Yale University) and Jose Valenzuela: Their research project was to model social interactions between different task groups of social insects.

* Jared Scolaro and Mitchell Anhoury (2014-2016): Their research project was to model division of labor of foundrass association in social ants by using Netlogo.

* Haoning Zhang (2013 Spring): His research project was to explore how fluctuating environments affect the bistability regions of discrete-time models on plant-herbivore interactions.

* Huang Wang (2011-2012): His research project was to model fish populations by using discrete-time models.

* **Michael Makiyama** (2010-2011): His research project was to perform parameter estimations on an obligate mutualism model. Partial results of this research is a subsection of our co-authored paper on mathematical modeling of leaf-cutter ants and fungus that is published in *Journal of Theoretical Biology* (2011, see Section **I.A.1** for details). Michael is a graduate student in Oregon State University.

* Wenyu Zheng (Fall 2010): Her research project was to study the dynamics of "Good Win" business cycles by using ecological theory of predator-prey interactions.

* Ben Cody (Fall 2009): His research project was to use graph theory to do a social network analysis of players in the national basketball association.

* Michael Katic (Fall 2009): His research project was to model plant-herbivore interactions in seasonal environments. Michael is working as Software Applications Engineer in Microchip Technology.

* Hanning Ren (Fall 2009): His research project was to use discrete-time systems to model population dynamics of leafcutter ants.

II.B.2.6-Obama Scholar Mentor for **4** undergraduate students at ASU since Fall 2010. I meet with scholars monthly to discuss why they are studying at ASU and what do they want to get out of their college experience. I provide an open, tolerant environment for scholars to share their concerns, struggles and engage in problem-solving behavior.

* Joshua Handler: Fall 2012-current.

* Jennifer Grijalva: Fall 2011-Spring 2012.

* Kayla Burkholder and Alexandra Morris: Fall 2010- Spring 2011.

II.B.2.7-Obama Scholar Mentor for **4** undergraduate students at ASU since Fall 2010. I meet with scholars monthly to discuss why they are studying at ASU and what do they want to get out of their college experience.

III.A. K-12 Students Mentoring: Since Fall 2019, my lab has been mentoring high schools for ASU SCENE Program (https://eoss.asu.edu/access/scene).

* During the academic year of 2019-2020, high school kids Sohan Chollera and Shruti Ramkumar have been working with me and my graduate students on mathematical modeling for honeybee.

* Spring 2022-Spring 2023: Raymond Zhou worked on *How policy impact human behavior on substance abuse* and his research project obtained the third place in the Senior Division of *Behavioral & Social Science* at Arizona Science Fair.

* Fall 2023-current: Georgia Bukata and Sahana Attaluri are from the ASU SCENE program 2023.

IV.A. Postdoc/Research Scholar Mentoring:

* Nov 2023-Current: Dr. Jun Chen is working on mathematical modeling of honeybee subject to climate change and pesticides.

* Mar 2024-Current: Dr. Lifan Chen is visiting ASU for research collaboration on *Complex Adaptive System Modeling*.

* 2019-2021: Dr. Congbo Xie is a Professor from Faculty of Science, Dalian Minzu University.

* 2020-2021: Dr. Haowei Ti is the director of Hong Kong Asia Business College.

* 2021-2022: Dr. Ozgur Aydogmus was a fulbright research scholar. He is a Professor of Social Sciences at University of Ankara.

* 2019-2021: Dr. Lisha Wang is a postdoc in Applied Mathematics at University of Chinese Academy.

* 2019-2021: Dr. Tao Feng is Professor in Applied Mathematics, Yangzhou University.

* 2019-2020: Dr. Marisabel Rodriguez Mesan is a researcher at FDA.

* 2019-2020: Dr. Yufang Wang is a Professor from Department of Statistics, Tianjin University of Finance and Economics.

* 2019-2020: Dr. Jia Liu is an Associate Professor from Department of Basic Courses, Jiangsu Vocational College of Electronics and Information, Huaian.

* 2018-2020: Dr. Asma Azizi Boroojeni is an Assistant Professor in Applied Mathematics at Kennesaw State University.

* 2017-2018: Dr. Na Tang is an Associate Professor from School of Mathematics Science, Huaiyin Normal University.

* 2017-2018: Dr. Cely Gonzales is a postdoc of The Quinn lab at Michigan State University.

* 2016-2018: Dr. Rao Feng is a Professor from Department of Mathematics, School of Physical and Mathematical Sciences, Nanjing Tech University, Nanjing.

* 2013-2016: Dr. Derdei Mahamat Bichara is an Associate Professor at Department of Mathematics, California State University, Fullerton.

III. Service Activities

III.A. Service at Arizona State University:

III.A.1-Unit Service:

- Hiring Committee for Position in Ecology: Fall 2023–Spring 2024.
- PSM Program Assessment Committee: Spring 2023–Current.
- Working Group for CISA School Transition: Fall 2022-Current.
- University Senator of Science and Mathematics Faculty for CISA: Fall 2022-Current.
- Evaluation for Faculty: Fall 2014-current.
- Chair of Personnel Committee: Fall 2017–Spring 2018.
- Personnel Committee: Fall 2015–Spring 2017, Spring 2021/2022/2023 (*Ad hoc*), Fall 2021/2022 (*Ad hoc*).
- Committee to develop major and minor in Mathematics: Fall 2015-Spring 2017.
- The organizing committee of Applied Science Seminars of CLS: Fall 2014.
- University Senator of Science and Mathematics Faculty of College of Letters and Sciences (CLS, Poly): Fall 2013-Fall 2016.
- Applied Mathematics Search Committee: Spring 2011-Fall 2012.
- Awards Committee for Applied Sciences and Mathematics: Spring 2011-Fall 2012.
- Committee to develop minor in Mathematics: Fall 2010-Fall 2012.
- Committee of *Reviewing Graduate Degree Program of the Master's Degree for Applied Biology Science*: Spring 2009- Spring 2011.
- Committee of *Undergraduate Research*: Fall 2010- Spring 2011
- Committee to develop minor in Physics: Fall 2010- Spring 2011.

- Committee of *Hiring Lecturers in Mathematics*: 2010 Summer.
- Committee of *Developing Professional Sciences Masters*: Spring 2009- Fall 2010.
- Committee of *Evaluating Instructional Specialists*: Spring 2009- Fall 2010.

III.A.2-College Service:

- President of CISA-College Assembly Council: Spring 2024-Current.
- Chair of CISA Committee of Bylaws: Fall 2023.
- President-Elect of CISA-College Assembly Council: Fall 2023.
- CISA- College Assembly Committee: Fall 2022–current.
- CISA Task Force Group on Research of Bylaws: Spring 2023.
- Personnel Committee: Fall 2018–Fall 2021(*Ad hoc*).
- Committee on Committee (represent Poly Campus) Fall 2015-Fall 2016.
- Governance Grievance Committee (represent Poly Campus) Fall 2015-Spring 2018.
- Grievance Clearinghouse Committee (represent Poly Campus) Fall 2015-Spring 2018.
- The search committee of Dean of College of Letters and Sciences (CLS, Poly) Fall 2014.
- Membership of AMLSS Graduate Studies Committee: Fall 2014-current.
- Committee member of Scholarship for *College of Technology & Innovation* (CTI): Spring 2012-Fall 2012.
- PhD Admission Committee for *Simulation, Modeling, and Applied Cognitive Science* (SMACS) PhD Program: Spring 2011-current.
- Obama Scholar Mentor: Fall 2010-Fall 2014 (I have been mentoring 4 undergraduate students in the CTI).
- Committee member of Academic Standards of CTI: Fall 2010-Fall 2012.

III.A.3-University Service:

- President-Elect for *Faculty Women Associate at ASU* Fall 2024-Current.

- Student Faculty Policy Committee: Spring 2023-Current.
- University P&T Committee: Spring 2023-Current.
- NSF-workshop coordinating committee with UIDP, May 10-11, 2022.
- Reviewer Committee for *Presidential Postdoctoral Fellowships*, Fall 2021-Current.
- University Advisory Board of *Career and Professional Development Services*, 2020- 2022.
- Executive Board of ASU Faculty Women's Association Fall 2016-current.
- Past-President of Poly Campus Assembly, University Senate Committee, 2020-2021.
- President of Poly Campus Assembly, University Senate Committee, 2019-2020.
- President-Elect, Poly Campus Assembly, University Senate Committee, 2018-2019.
- Chair of Governance Grievance Committee, 2017- 2018

III.B. Professional Service:

III.B.1- Local Organizing Committees of National and International Conferences:

- October 12 - 14, 2019: I served on the local Organizing Committee of *ICMA VII : Seventh International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems*, Arizona State University, Tempe. See the details of this conference in https://math.asu.edu/icma-2019
- October 05-07, 2018: I served on the local Organizing Committee of *The 11th International Symp. on BEER*. See the details of this conference in https://about.illinoisstate.edu/biomath/beer/Pages/default.aspx
- October 20 - 22, 2017: I served on the local Organizing Committee of *ICMA VI : Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems*, at University of Arizona. See the details of this conference in https://math.la.asu.edu/ icma2016/scope.html
- June 10-13, 2013: I served on the local Organizing Committee of *The Society for Mathematical Biology Annual Meeting and Conference*, Tempe, Arizona, June 10-13, 2013. See the details of this conference in http://math.asu.edu/SMB2013

III.B.2-Editorship:

- Fall 2022-Current: Serve on Editorial Board of *Journal of Biology Systems*.

- Summer 2021-Current: Serve on Editorial Board of *Mathematical Biosciences and Engineering.*

- Guest Editorship (2020-2021): Special Issue *Mathematical modeling and analysis of social and ecological determinants for the dynamics of infectious diseases and public health policies* in Mathematical Biosciences and Engineering.
  See the details of this issue in https://www.aimspress.com/newsinfo/1383.html

- Fall 2017-Current: Serve on Editorial Board of *Nonlinear Dynamics and Systems Theory.*

- Summer 2017-Current: Serve on Editorial Board of *Natural Mathematical Modeling.*

- Fall 2013-Current: Serve on Editorial Board of *JSM Mathematics and Statistics* (http://www.jscimedcentral.com/Mathematics/aims-scope).

- Guest Editorship: Special Issue *Advanced Nonlinear Dynamics of Population Biology and Epidemiology* in *Abstract and Applied Analysis* (with Weiming Wang, Malay Banerjee, and Kaifa Wang). See the details of this issue in http://www.hindawi.com/journals/aaa/si/984374/

III.B.3-Chaired/Organized minisymposium in the national/international conferences:

- Jan 8-11, 2025: Organize a special session on the topic of *Modeling Complex Adaptive Systems in Life and Social Sciences* at *Joint Mathematics Meetings*, Seattle, Washington St.

- Jan 3-6, 2024: Organize a special session on the topic of *Modeling Complex Adaptive Systems in Life and Social Sciences* at *Joint Mathematics Meetings*, San Francisco, CA.

- Jan 4-7, 2023: Organize a special session on the topic of *Ecological and Evolutionary Dynamics in Life and Social Sciences* at *Joint Mathematics Meetings*, Boston.

- July 3-7, 2022: Organize a special session on the topic of *The Role of Individual Variation on Collective Information Processing* at IUSSI-NAS (International Union for the Study of Social Insects, North American Section) 2022 Meeting, hosted by the University of California, San Diego between July 3-8, 2022.

- April 4-9, 2022: Organize a special session on the topic of *Complex Adaptive Systems and Evolutionary Models in Biology and Psychology* at *Joint Mathematics Meetings*, Washington State Convention Center and the Sheraton Grand Seattle Hotel, Seattle, WA, .

- Nov 5-7, 2021: The 4th Annual Meeting of the SIAM Texas-Louisiana Section (TXLA21), University of Texas Rio Grande Valley, South Padre Island, Texas, .

- Jun 13-17, 2021: Organized a special session on the topic of *The complex adaptive dynamics of honeybee societies* in Virtual 2021 Annual Meeting SMB, Jun 13-17, 2021.

- October 31-November 02, 2019: Organized a special session on the topic of *Complex Adaptive Systems* in 2019 SACNAS-*The National Diversity in STEM Conference*, Honolulu, Hawai'i, October 31-November 02, 2019.

- July 01-05, 2016: Organized a special session on the topic of *Complex Biological and Ecological Systems* (SS96) in *The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications* (AIMS 2016), Orlando, Florida, U.S, July 01-05, 2016.

- October 09-11, 2015: Organized an invited special topic on *Complex Biological Systems* at *The 8th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2015), Illinois State University, Normal, IL, October 09-11, 2015.

- September 28-Oct 02, 2015: Co-organizes a satellite session on *Complex Biological Systems that Link Disease, Parasites, and Nutrient Ecology* at *Conference on Complex Systems* (CCS-2015), Arizona State University, Tempe, AZ, September 28-Oct 02, 2015.

- July 8-10, 2015: Co-organizes a mini-symposia on *Complex Adaptive and Evolutionary Models in Biology* in Mathematical Models in Ecology and Evolution (MMEE 2015), College of France, Paris, July 08-10, 2015.

- October 10-12, 2014: Co-organizes an invited special topic on *Social Insects as Complex Systems* at *The 7th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2014), Claremont Colleges, Claremont, CA, October 10-12, 2014.

- August 4-7, 2014: Co-organized a minisymposium on *Mathematical Models in Biology and Epidemiology* and Chaired a contributed session on epidemiology (CP3) in SIAM Conference on the Life Sciences (LS14), Sheraton Charlotte in Charlotte, North Carolina, USA, August 4-7, 2014.

- October 11-13, 2013: Co-organized an invited special session on *Complex Systems of Social Insects* at *The 6th International Symposium on Biomathematics and Ecology: Education and Research* (BEER-2013), Marymount University, Arlington, VA, October 11-13, 2013.

- October 5-6, 2013: Co-organized a special session on *Mathematical Models in Biology and Physiology* at *the American Mathematical Society Southeastern Sectional Meeting*, University of Louisville, Louisville, KY, October 5-6, 2013.

- October 4-6, 2013: Co-organized two special sessions on *Evolutionary Modeling in Ecology* with Oyita Udiani and *Recent Advances in Mathematical Epidemiology and Ecology* at *The Fourth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems* (ICMA IV), Texas Tech University in Lubbock, Texas, October 4-6, 2013.

- July 1, 2012: Chaired a session for Special Section 14 on *Mathematical Models in Biology and Medicine* in the 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications (AIMS 2012), Orlando, Florida, U.S., July 01-05, 2012.

- July 18 - 22, 2011: Co-organized a minisymposium on *Modeling of Ecological Systems* at *the 7th International Congress on Industrial and Applied Mathematics* (ICIAM 2011), Vancouver, BC, Canada, July 18 - 22, 2011.

- May 22 - 26, 2011: Co-organized a minisymposium on *Recent applications of dynamical systems in ecology* at *SIAM Conference on Applications of Dynamical Systems* (SIAM DS11), Snowbird, Utah, USA, May 22 - 26, 2011.

- January 6-9, 2011: Co-organized a minisymposium on *Applications of Difference and Differential Equations in Ecology and Epidemiology I& II* at *Joint Mathematics Meetings*, New Orleans, January 6-9, 2011.

III.B.3-Panelist/Reviewers for Grant Proposals:

- July, 2020: *Ad hoc* reviewer for NSF Panel.

- May, 2024: Served on NSF Panel.

- 2021-2022: *Ad hoc* reviewer for Dutch Research Council

- May, 2020: *Ad hoc* reviewer for NSF Panel.

- Oct, 2019: Served on NSF Panel.

- Since 2019: Proposal reviewer for the annual internal grant competition at the Center for Excellence in Applied Computational Science & Engineering (CEACSE) in the University of Tennessee at Chattanooga (UTC).

- January, 2018: Reviewer for the Alberta Conservation Association's ACA Research Grants program.

- August, 2017: Reviewer for the excellence programme of the Vienna Science and Technology Fund (www.wwtf.at) within the Vienna Research Groups for Young Investigators call in the field of "Mathematics and?"

- August, 2014: Reviewer for CZECH Science Foundation.

- March, 2014: Served on NSF Panel.

- January, 2012: *Ad hoc* reviewer for Post-Doctoral Research Fellowship in *Ecology & Evolutionary Biology* Program of NSF (1).

- July, 2010: *Ad hoc* reviewer for *Population and Community Ecology* program of NSF (1).

III.B.4-External Examiner for PhD Dissertation:

- Summer 2023- External examiner for Akshay Sharma's PhD dissertation on the topic of *Mathematical models to understand the role of delay and noise in miR-17-92 regulatory network* for Dept. of Mathematics & Statistics, Swinburne University of Technology.

- Summer 2014- External examiner for Xi Hu's PhD dissertation on the topic of *Dynamics of Intraguild Predation Models* for Dept. of Mathematics & Statistics, The University of New Brunswick.

III.B.5-Reviewer for Journals: Since 2008, I have reviewed more than **10** papers per year for over a **dozen** of journals in the filed of mathematics and theoretical biology, including but not limit to*Advanced Robotics*; *Applied Mathematical Modeling*; *The American Naturalist*; *Animal Ecology*; *Applied Mathematical Modeling*; *Bulletin of Mathematical Biology*; *BIOMATH*; *Biosystems*; *International Journal of Bifurcation and Chaos*; *Ecological Applications*; *Ecology*; *Ecological Modeling*; *Ecological Complexity*; *Current Zoology*; *Journal of Acta Biotheoretica*; *Journal of Advances in Difference Equations*; *Journal of Biological Dynamics*; *Journal of Biological Systems*; *Journal of Computers and Mathematics with Applications*; *Journal of Difference Equations and Applications*; *Journal of Discrete and Continuous Dynamical Systems*; *International Journal of Bifurcation and Chaos*; *International Journal of Computational Mathematics*; *International Journal of Nonlinear Sciences and Numerical Simulations*; *Journal of Theoretical Biology*; *Journal of Mathematical Biology*; *Journal of Mathematical Analysis and Applications*; *Journal of Mathematics and Computers in Simulation*; *Journal of Mathematical Medicine and Biology*; *Journal of Nonlinear Analysis: Real World Applications*; *Journal of Nonlinear Analysis*; *Journal of Nonlinear Differential Equations and Applications*; *Journal of Nonlinear Dynamics and Systems Theorem*; *Journal of Oikos*; *Mathematical Biosciences*; *Mathematical Biosciences and Engineering*; *Natural Resource Modeling*; *Population Ecology*; *PLUSONE in Biology*; *Proceedings of Royal Society B*; *Theoretical Population Biology*; *Theoretical Population Biology*; *Theory in Biosciences*; *SIAM-Applied Dynamics*.

III.C.Community Service:

- Jan 2023-Current: the International Advisory Committee for the 4th International Conference on Mathematical Techniques and Applications (ICMTA-2023) from March 22 to March 24, 2023 held at Department of Mathematics, SRM Institute of Science and Technology (Formerly known as SRM University).

- Jun 2022-Current: Scientific Committee of International Congress of Bee Sciences.

- Feb 01, 2020-Jan 31, 2023: the AMS-Simons Travel Grants Committee.

- Feb 01, 2020-Jan 31, 2023: AMS Representative to the Joint Committee on Women in the Mathematical Sciences.

- Aug 30, 2019-current: the treasure and the board of directors of *International Society of Difference Equations*.

- May 2017-current: Society for Industrial and Applied Mathematics (SIAM) Faculty Advisor for SIAM Chapter at Arizona State University.

- March 4, 2013: Participate in the *6th Arizona MGE@MSA Faculty Doctoral Mentoring Institute*, Arizona State University, Tempe Campus.

- 2011-2014, I actively involved in the program of *Women in Science and Engineering* (WISE) at CTI. I have participated in brainstorm how Polytechnic campus can partner with Girl Scouts-Arizona Cactus-Pine Council in promoting careers in STEM among young women through their Generation STEM program with Barbara Aarestad and Carolyn Starr (ASU, Polytechnic).

- March 13-15, 2010: Participant in mathematical outreach program for high school students. The recent activity is *Math Circles on the Road at ASU*, where I volunteered for holding a table on the topic "Index and Harry Ball" for high school kids.

- 2010 Summer, I served as a Judge for *AWM Essay Contest: Biographies of Contemporary Women in Mathematics*.

- 2009-2011, I mentored an undergraduate student-Ana Gonzalez who was in Mathematics Education Program at the University of California, Irvine, through *AWM network*. We called each other every week from 30 minutes to an hour to discuss the progress of her study (e.g., how to deal with abstract concepts in Linear Algebra; which courses should take; what kind of summer workshops she could apply).

- May 2009-Spring 2015, I served on the *Committee of Association for Women in Mathematics (AWM) Mentor Network*. My duty is to assign a proper mentor (professors, associated professors and assistant professors) to mentee (undergraduate, graduate, junior faculty) according to mentee's request.

III.D. Professional Affiliations:

- Member of the *American Mathematical Society* (AMS);

- Member of the *Association for Women in Mathematics* (AWM);

- Member of the *Faculty Association for Women* (FAW) at Arizona State University;

- Member of the *International Society of Difference Equations* (ISDE);

- Member of the *Mathematical Association of America* (MAA);

- Member of the *Society of Mathematical Biology* (SMB);

- Member of the *Society for Industrial and Applied Mathematics* (SIAM).