

Jasmine Y. Foo

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EDUCATION **Brown University**, Providence, Rhode Island USA
Ph.D., Applied Mathematics, May 2008
Sc.M., Applied Mathematics, May 2005
Sc.B., Mathematics/Physics with Honors, May 2002

ACADEMIC EXPERIENCE

University of Minnesota

- *Northrop Professor* 6/2023-present
- *Associate Head, School of Mathematics* 1/2021-present
- *Professor, School of Mathematics* 9/19-present
- *Associate Professor, School of Mathematics* 9/15-8/19
- *Assistant Professor, School of Mathematics* 9/11-8/15

Harvard University and Dana Farber Cancer Institute

Postdoctoral researcher, Biostatistics and Computational Biology 2010-2011

Memorial Sloan Kettering Cancer Center

Postdoctoral researcher, Computational Biology 2008-2010

EXTENDED ACADEMIC VISITS

- Oslo Center for Biostatistics and Epidemiology, Faculty of Medicine, 2018-2019, June 2022, August 2023
- Mathematical Biosciences Institute, Ohio State University, Fall 2014.
- Institute for Mathematics and its Applications, UMN, 2012-2013.
- Lawrence Berkeley National Laboratories, Summer 2005.

SELECTED HON- ORS/AWARDS

- University Northrop Chair (2023-present)
- US Fulbright Grant for sabbatical (2018-2019)
- NSF CAREER Award, Division of Mathematical Sciences (2014-2019)
- McKnight Land Grant Professorship (2013-2015)
- National Cancer Institute PSOC Young Investigator Award (2010)
- Sigma Xi Award for Excellence in Graduate Research (2008)
- United States Department of Energy Computational Science Graduate Fellowship (2004-2008)

PUBLICATIONS

1. Li, A., Kibby, D., Foo, K. A Comparison of Mutation and Amplification-Driven Resistance Mechanisms and Their Impacts on Tumor Recurrence, submitted.
2. Wu, C., Gunnarsson, E., Myklebust, E., Kohn-Luque, A., Tadele, D., Enserink, J., Frigessi, A., Foo, J., Leder, K. Using birth-death processes to infer tumor subpopulation structure from live-cell imaging drug screen data, submitted.
3. E. Gunnarsson and J. Foo. Mathematical models of resistance evolution under continuous and pulsed anti-cancer therapies, submitted.
4. E. Gunnarsson, J. Foo, K. Leder. Statistical inference of the rates of cell proliferation and phenotypic switching in cancer, accepted, *Journal of Theoretical Biology*, 2023.
5. J. Foo, E. Gunnarsson, K. Leder, D. Sivakoff. Dynamics of advantageous mutant spread in spatial death-birth and birth-death Moran models. accepted, *Communications in Applied Mathematics and Computational Science*, 2023. Special issue in memory of Ching Shan Chou.
6. A. Kohn-Luque, E. M. Myklebust, D. S. Tadele, M. Gilberto, J. Noory, E. Harivel, P. Arsenteva, S. Mumenthaler, F. Schjesvold, K. Tasken, J. Enserink, K. Leder, A. Frigessi, J. Foo. PhenoPop: Phenotypic deconvolution in heterogeneous cell populations using drug screening data. *Cell Reports Methods*, 3 (100417), 2023.
7. J. Foo, E. Gunnarsson, K. Leder, K. Storey. Spread of premalignant clones and cancer initiation in multilayered tissue, *Annals of Applied Probability*, Vol. 33, No. 1, 299-343, 2023
8. J. Foo, R. Rockne, D. Basanta, et al. Roadmap on plasticity and epigenetics in cancer, *Physical Biology*, Vol. 19 (3), 2022.
9. J. Foo. Cancer evolution in spatially structured tissue. *Notices of the AMS*, Oct 2021.
10. E. Gunnarsson, K. Leder, and J. Foo. Exact site frequency spectra of neutrally evolving tumors: transitions between power laws and signatures of cell viability. *Theoretical Population Biology*, Vol. 142, p.67-90, 2021.
11. Foo, J., Leder, K., and Schweinsberg, J. Mutation timing in a spatial model of evolution. *Stochastic Processes and their Applications*, Vol. 130 (10), 2020.
12. S. Kim, S. Choung, R. Sun, N. Ung, N. Hashemi, R. Lau, E. Spiller, J. Gasho, J. Foo, S. Mumenthaler. Comparison of cell and organoid-level analysis of patient-derived 3D organoids to evaluate tumor cell growth dynamics and drug response. *SLAS Discovery*, Vol. 25 (7), pages 744-754, 2020.
13. Einar Gunnarsson, Subhajyoti De, Kevin Leder, and Jasmine Foo. Understanding the role of phenotypic switching in cancer drug resistance. *Journal of Theoretical Biology*, Vol. 490 (7), 2020.
14. Emma E. Goldberg and Jasmine Foo. Memory in trait macroevolution. *American Naturalist*, Vol. 195(2), 2020.
15. Katie Storey, Kevin Leder, Andrea Hawkins-Daarud, Kristin Swanson, Atique Ahmed, Russell Rockne, and Jasmine Foo. Glioblastoma recurrence and the role of MGMT methylation. *JCO Clinical Cancer Informatics*. 3: pp 1-12. 2019.
16. Kamran Kaveh, Yutaka Takahashi, Michael A Farrar, Guy Storme, Marcucci Guido, Jamie Piepenburg, Jackson Penning, Jasmine Foo, Kevin Z Leder, and Susanta K

- Hui. Combination therapeutics of nilotinib and radiation in Acute Lymphoblastic Leukemia as an effective method against drug-resistance. *PLoS Computational Biology*, 13(7):e1005482, 2017.
17. Kathleen Storey, Marc D Ryser, Kevin Leder, and Jasmine Foo. Spatial measures of genetic heterogeneity during carcinogenesis. *Bulletin of Mathematical Biology*, 79(2):237-276, 2017.
 18. Danika Lindsay, Colleen M Garvey, Shannon M Mumenthaler, and Jasmine Foo. The response of cancer cell populations to therapies. *Ecology and Evolution of Cancer*, pages 137-152. Elsevier, 2017.
 19. Danika Lindsay and Jasmine Foo. Impact of tumor oxygenation on drug resistance evolution under hypoxia-activated prodrug therapy. In *Proceedings of the 5th International Conference on Biomedical Engineering*, 2017.
 20. Qie He, Junfeng Zhu, David Dingli, Jasmine Foo, and Kevin Zox Leder. Optimized treatment schedules for chronic myeloid leukemia. *PLoS Computational Biology*, 12(10):e1005129, 2016.
 21. Marc D Ryser, Walter T Lee, Neal E Ready, Kevin Z Leder, and Jasmine Foo. Quantifying the dynamics of field cancerization in tobacco-related head and neck cancer: a multiscale modeling approach. *Cancer Research*, 76(24):7078-7088, 2016.
 22. Danika Lindsay, Colleen M Garvey, Shannon M Mumenthaler, and Jasmine Foo. Leveraging hypoxia-activated prodrugs to prevent drug resistance in solid tumors. *PLoS Computational Biology*, 12(8):e1005077, 2016.
 23. Colleen M Garvey, Erin Spiller, Danika Lindsay, Chun-Te Chiang, Nathan C Choi, David B Agus, Parag Mallick, Jasmine Foo, and Shannon M Mumenthaler. A high-content image-based method for quantitatively studying context-dependent cell population dynamics. *Scientific Reports*, 6:29752, 2016.
 24. Richard Durrett, Jasmine Foo, and Kevin Leder. Spatial moran models II: Cancer initiation in spatially structured tissue. *Journal of Mathematical Biology*, 72(5):1369-1400, 2016.
 25. Jasmine Foo, Lin L Liu, Kevin Leder, Markus Riester, Yoh Iwasa, Christoph Lengauer, and Franziska Michor. An evolutionary approach for identifying driver mutations in colorectal cancer. *PLoS Computational Biology*, 11(9):e1004350, 2015.
 26. Shannon M Mumenthaler, Jasmine Foo, Nathan C Choi, Nicholas Heise, Kevin Leder, David B Agus, William Pao, Franziska Michor, and Parag Mallick. The impact of microenvironmental heterogeneity on the evolution of drug resistance in cancer cells. *Cancer Informatics*, 14:CIN-S19338, 2015.
 27. Jasmine Foo, Cymra Haskell, Natalia L Komarova, Rebecca A Segal, and Karen E Wood. Modeling sympatric speciation in quasiperiodic environments. *Applications of Dynamical Systems in Biology and Medicine*, pages 149-174. Springer, 2015.
 28. Jasmine Foo, Kevin Leder, and Junfeng Zhu. Escape times for branching processes with random mutational fitness effects. *Stochastic Processes and Their Applications*, 124(11):3661-3697, 2014.
 29. Jasmine Foo, Kevin Leder, and Marc D Ryser. Multifocality and recurrence risk: a quantitative model of field cancerization. *Journal of Theoretical Biology*, 355:170-184, 2014.

30. Jasmine Foo and Franziska Michor. Evolution of acquired resistance to anti-cancer therapy. *Journal of Theoretical Biology*, 355:10-20, 2014.
31. Leila Aghili, Jasmine Foo, James DeGregori, and Subhajyoti De. Patterns of somatically acquired amplifications and deletions in apparently normal tissues of ovarian cancer patients. *Cell Reports*, 7(4):1310-1319, 2014.
32. Jasmine Foo and Kevin Leder. Dynamics of cancer recurrence. *Annals of Applied Probability*, 23(4):1437-1468, 2013.
33. Jasmine Foo, Kevin Leder, and Shannon M Mumenthaler. Cancer as a moving target: understanding the composition and rebound growth kinetics of recurrent tumors. *Evolutionary Applications*. 6(1):54-69, 2013.
34. David B Agus, Jenolyn F Alexander, Wadih Arap, Shashan,a Ashili, Joseph E Aslan, Robert H Austin, Vadim Backman, Kelly J Bethel, Richard Bonneau, Wei-Chiang Chen, et al. A physical sciences network characterization of non-tumorigenic and metastatic cells. *Scientific Reports*, 3:1449, 2013.
35. Jingmin Shu, Zhilian Xia, Lihua Li, Ellen T Liang, Nicholas Slipek, Dawen Shen, Jasmine Foo, Subbaya Subramanian, and Clifford J Steer. Dose- dependent differential mrna target selection and regulation by let-7a-7f and mir-17-92 cluster micrnas. *RNA Biology*, 9(10):1275-1287, 2012.
36. Jasmine Foo and Kevin Leder. Rare events in cancer recurrence timing. *IEEE Winter Simulation Conference Proceedings 2012*, pages 1-10, 2012.
37. Foo, J., Chmielecki, J., Pao, W., Michor, F. ‘Effects of pharmacokinetic processes and varied dosing schedules on the dynamics of acquired resistance to erlotinib in EGFR-mutant lung cancer,’ *Journal of Thoracic Oncology* (2012) Vol 7 (10).
38. Min Tang, Jasmine Foo, Mithat Gonen, Joelle Guilhot, Francois-Xavier Mahon, and Franziska Michor. Selection pressure exerted by imatinib therapy leads to disparate outcomes of imatinib discontinuation trials. *Haematologica*, 2012.
39. Shannon M Mumenthaler, Jasmine Foo, Kevin Leder, Nathan C Choi, David B Agus, William Pao, Parag Mallick, and Franziska Michor. Evolutionary modeling of combination treatment strategies to overcome resistance to tyrosine kinase inhibitors in non-small cell lung cancer. *Molecular Pharmaceutics*, 8(6):2069-2079, 2011.
40. Kevin Leder, Jasmine Foo, Brian Skaggs, Mercedes Gorre, Charles L Sawyers, and Franziska Michor. Fitness conferred by BCR-ABL kinase domain mutations determines the risk of pre-existing resistance in chronic myeloid leukemia. *PloS ONE*, 6(11):e27682, 2011.
41. Juliann Chmielecki, Jasmine Foo, Geoffrey R Oxnard, Katherine Hutchinson, Kadoaki Ohashi, Romel Somwar, Lu Wang, Katherine R Amato, Maria Arcila, Martin L Sos, et al. Optimization of dosing for EGFR-mutant non-small cell lung cancer with evolutionary cancer modeling. *Science Translational Medicine*, 3(90):90ra59-90ra59, 2011.
42. Rick Durrett, Jasmine Foo, Kevin Leder, John Mayberry, and Franziska Michor. Intratumor heterogeneity in evolutionary models of tumor progression. *Genetics*, 188(2):461-477, 2011.
43. Jasmine Foo, Kevin Leder, and Franziska Michor. Stochastic dynamics of cancer initiation. *Physical Biology*, 8(1):015002, 2011.
44. Jasmine Foo and George Em Karniadakis. Multi-element probabilistic collocation method in high dimensions. *Journal of Computational Physics*, 229(5):1536-1557, 2010.

45. Rick Durrett, Jasmine Foo, Kevin Leder, John Mayberry, and Franziska Michor. Evolutionary dynamics of tumor progression with random fitness values. *Theoretical Population Biology*, 78(1):54-66, 2010.
46. Jasmine Foo and Franziska Michor. Evolution of resistance to anti-cancer therapy during general dosing schedules. *Journal of Theoretical Biology*, 263(2):179-188, 2010.
47. Jasmine Foo and Franziska Michor. Evolution of resistance to targeted anti-cancer therapies during continuous and pulsed administration strategies. *PLoS Computational Biology*, 5(11):e1000557, 2009.
48. Jasmine Foo, Mark W Drummond, Bayard Clarkson, Tessa Holyoake, and Franziska Michor. Eradication of chronic myeloid leukemia stem cells: A novel mathematical model predicts no therapeutic benefit of adding G-CSF to imatinib. *PLoS Computational Biology*, 5(9):e1000503, 2009.
49. Jasmine Foo, Suzanne Sindi, and George Em Karniadakis. Multi-element probabilistic collocation for sensitivity analysis in cellular signalling networks. *IET Systems Biology*, 3(4):239-254, 2009.
50. Jasmine Foo, Xiaoliang Wan, and George Em Karniadakis. Multi-element probabilistic collocation method (ME-PCM): Error analysis and applications. *Journal of Computational Physics*, 227(22):9572-9595, 2008.
51. Prempraneerach, P, Foo, J, Triantafyllou, M., Chryssostomidis, C., Karniadakis, G, Gradient-free Stochastic Sensitivity Analysis of the Ship-board Power System, *Proceedings International Simulation Multi-Conference*, Edinburgh, Scotland (2008).
52. Jasmine Foo, Zohar Yosibash, and George Em Karniadakis. Stochastic simulation of riser-sections with uncertain measured pressure loads and/or uncertain material properties. *Computer Methods in Applied Mechanics and Engineering*, 196(41-44):4250-4271, 2007.
53. John B Bell, Jasmine Foo, and Alejandro L Garcia. Algorithm refinement for the stochastic Burgers equation. *Journal of Computational Physics*, 223(1):451-468, 2007.
54. D Lucor, J Foo, and GE Karniadakis. Vortex mode selection of a rigid cylinder subject to viv at low mass-damping. *Journal of Fluids and Structures*, 20(4):483-503, 2005.
55. D Lucor, J Foo, and GE Karniadakis. Correlation length and force phasing of a rigid cylinder subject to viv. In *Proceedings IUTAM Symposium*. Integrated Modeling of Fully Coupled Fluid Structure Interactions Using Analysis, Computations and Experiments, pages 187-199. Springer, 2003.

FUNDING SOURCES

1. Co-PI. NSF Civil, Mechanical and Manufacturing Innovation. “Data analytics for high throughput drug screening” (2023-2026)
2. PI. Research Council of Norway “Norwegian-American Alliance for Research and Education in Data-Driven Mathematical Models of Cancer” (2020-2023)
3. PI. NSF-Division of Mathematical Sciences. “Evolutionary dynamics of non-genetic mechanisms of drug resistance in cancer” (2021-2024)

4. Co-PI. NIH R01 Admin. Supp. *Investigating the role of peristaltic forcing on colorectal cancer cell intravasation via mathematical modeling and organ-on-chip biomimetic models* (2021-2023)
5. Co-PI. Norwegian Centennial Chair Grant. *“Computational approaches for personalized cancer therapy”* (2020-2023)
6. Co-PI. NSF-Division of Mathematical Sciences. Conference Grant *“Field of Dreams: Growing a Diverse Mathematical Community.”* (2020-2022)
7. PI. NSF-Division of Mathematical Sciences. Conference Grant *“Workshop on Multi-scale Modeling in Biology”*(2018-2019)
8. PI. US Fulbright Scholar Grant (2018-2019) (sabbatical funding)
9. PI. NSF Division of Mathematical Sciences (DMS) *“CAREER: Stochastic models of cancer evolution.”* (2014-2020)
10. PI. McKnight Foundation *“Mathematics of cancer evolution.”* (2013-2015)
11. PI. NSF-Division of Mathematical Sciences *“Understanding stochasticity in cancer recurrence timing.”* (2012-2016)
12. Co-PI, NIH NCI Physical Sciences-Oncology Transnetwork *“Quantitative models of the effect of the tumor microenvironment on development of drug resistance.”* (2013-2014)
13. Co-PI, NIH National Cancer Institute PSOC Transnetwork (2011-2012) *“Development of quantitative models of penetrance of resistance.”*
14. NIH NCI PSOC (2010-2011) *“Towards an evolutionary framework for identifying driver mutations.”*
15. NIH NCI PSOC (2010-2011) *“Using genomic diversity of passenger mutations as prognostic markers for metastasis.”*

SELECTED *planned

TALKS SINCE (v) - virtual
2015

- City of Hope Cancer Center, Department of Medical Oncology and Therapeutics, Colloquium (November 2023*)
- Columbia University, Irving Center for Cancer Dynamics (Oct 2023*)
- Purdue University, Mathematics Dept, Applied Math seminar (Sept 2023*)
- ICIAM Minisymposium on Stochastics in Biology (August 2023*)(v)
- ICERM Workshop on Mathematical and Computational Biology (June 2023)
- Max Planck Institute for Evolutionary Biology, Symposium on Mathematical Modeling of Resistance and Evolution (April 2023) keynote
- UMN BME Graduate Colloquium (March 2023)
- Mathematical Molecular Biology Online Seminar (March 2023)
- 2023 Shanks Workshop on Advances in Mathematical and Theoretical Biology, Vanderbilt (March 2023) plenary
- Pfizer Pharmaceuticals, SM&S Seminar (February 2023) (v)
- Moffitt Cancer Center, IMO colloquium (August 2022)
- EMBO Workshop on “Drug-tolerant persister cells,” Croatia (July 2022) (v)
- Centre de Recherches Mathématiques, Montreal, Workshop on “Branching systems, reaction diffusion equations and population models,” May 2022) (v)
- USC, Ellison Institute for Transformative Medicine, seminar (May 2022)
- UMN, CSE Alumni 50th reunion (May 2022)

- Virginia Commonwealth University, Biomathematics seminar (April 2022) (v)
- Johns Hopkins University, Applied Math and Statistics Colloquium (Feb 2022)
- Univ. of Illinois Urbana Champaign, Mathematical Biology seminar (Sept 2021) (v)
- AMS Fall Central Sectional Meeting (August 2021) (v) *invited address
- Centre International de Recontres Mathematiques, Luminy, France (June 2021) (v)
- EDGE Colloquium, University of Minnesota (June 2021)
- Society for Mathematical Biology Annual Meeting (June 2021) (v)
- SIAM Dynamical Systems Meeting, (May 2021) (v)
- University of New Mexico, Applied Math Seminar (May 2021) (v)
- UMN Biostatistics and Computational Biology Program, Colloquium (March 2021) (v)
- Ohio State University, Workshop on Spatial Stochastic Processes (March 2021) (v)
- UCLA Biomathematics Colloquium (December 2020) (v)
- University of Pennsylvania, Math Biology seminar (November 2020) (v)
- IMA Workshop on Tumor Microenvironment (April 2020) (v)
- SIAM Life Sciences Meeting, Garden Grove, CA (June 2020) canceled COVID19
- Creighton University, Mathematics Colloquium (Feb 2020)
- Ohio State University, Mathematical Biosciences Institute (November 2019)
- Midwest Probability Colloquium (October 2019)
- University of Oslo, Workshop on Personalized Medicine (May 2019)
- Imperial College, Math Biology seminar (December 2018)
- University of Edinburgh, Math Biology Seminar (November 2018)
- University of Oslo, Biostatistics seminar (August 2018)
- International Centre for Mathematical Sciences, University of Edinburgh, UK (July 2018)
- IMA Workshop on Ecological and Biological Systems (June 2018)
- Rutgers University, Institute for Quantitative Biology, (April 2018)
- University of Minnesota, School of Public Health, Epidemiology (April 2018)
- Arizona State University, Mathematics Department Colloquium (March 2018)
- Mayo Clinic, Phoenix AZ, Precision NeuroTherapeutics Lab (March 2018)
- University of Minnesota, Physics department, Biophysics seminar (Feb 2018)
- University of Illinois at Urbana-Champaign, Mathematics Colloquium (August 2017).
- University of Southern California, Aerospace and Mechanical Engineering Colloquium (Oct 2017).
- Duke University, SouthEastern Probability Conference (Rick Durrett's birthday conference), (May 2017).
- Gustavus Adolphus College, Mathematics and Computer Science Colloquium (May 2017)
- St. Olaf College, Mathematics Colloquium (April 2017)
- Undergraduate Women in Science and Engineering Club, UMN, (Oct 2016)
- City of Hope Cancer Center, CA (July 2016)
- University of Minnesota, Masonic Cancer Center seminar (April 2016)
- University of Minnesota, Probability seminar (Feb 2016)
- Newton Institute, Cambridge University (Jan 2016)
- Harvard University, School of Engineering and Applied Sciences (Dec 2015)
- Dana Farber Cancer Institute, Biostatistics and Computational Biology (Dec 2015)
- Northwestern University, Engineering Sciences and Applied Math Department Colloquium (Nov 2015)
- University of St Thomas, Center for Applied Mathematics, public lecture (Nov 2015)
- Univ. of Minnesota, Biostatistics Colloquium, May 2015
- Univ. of Minnesota, Physics Department, Biophysics seminar, April 2015

- University of Wisconsin-Madison, Mathematics Department, Colloquium (April 2015).

TEACHING

- **Courses at University of Minnesota:**

- Spring 2023, MATH 5651, Probability / Statistics Theory
- Fall 2021, MATH 8540, Topics in Math Biology: Deep learning in precision medicine
- Spring 2021, MATH 2241, Mathematical Modeling in Biology
- Fall 2020, MATH 5651, Probability/Statistics Theory
- Spring 2020, MATH 5651, Probability/Statistics Theory
- Sabbatical leave 2018-2019 academic year
- Instructor, Fall 2017, MATH 8540, Topics in Math Biology: Stochastic simulation: algorithms and theory
- Instructor, Fall 2016, MATH 5651, Probability/Statistics Theory
- Instructor, Spring 2016, MATH 5651, Probability/Statistics Theory
- Instructor, Fall 2015, MATH 8540, Topics in Math Biology: Stochastic processes in mathematical biology
- Instructor, Spring 2014, MATH 2374H Honors Linear Algebra/Differential Equations
- Instructor, Fall 2013, MATH 2373H Honors Multivariable Calculus
- Instructor, Spring 2013, MATH 8540, Topics in Math Biology: Stochastic modeling in evolutionary theory
- Instructor, Spring 2012, MATH 5651, Probability/Statistics Theory
- Instructor, Fall 2011, MATH 5651, Probability/Statistics Theory

- **At other institutions:**

- Instructor, Spring 2010, Evolutionary Dynamics of Cancer, *Cornell-Weill Medical School / Memorial Sloan Kettering*
- Teaching assistant, Multi-variable Calculus (Fall 2002), Ordinary Differential Equations I (Fall 2006), Ordinary/Partial Differential Equations II (Spring 2007), *Brown University*
- Tutor, (1998-2002, 2007-2008), Abstract Algebra, Real Analysis, Introductory Physics, Single- and Multi-variable Calculus, *Brown University*

- **Directed reading groups at UMN**

- Summer 2021, Directed reading on measure-theoretic probability theory and cancer biology, 2 graduate students.
- Spring 2021, Directed reading on stochastic processes, 2 graduate students
- Spring 2020 Directed reading and senior project on mathematical oncology, 1 undergraduate student.

MENTORING / RESEARCH SUPERVISION

- Mentoring undergraduate/high school student research projects (\approx **25 students**)
- Masters students:
 - **Jasmine Noory**, (MSc Math, 2021). *Deconvolution of drug response phenotypes in heterogeneous cell populations*
 - **Jackson Penning**, (MSc Biostatistics and Computational Biology, 2016). *Optimizing treatment of Acute Myeloid Leukemia using radiation and tyrosine kinase inhibitors*

- **Josh Koslosky** (MSc Math, 2014).
- Initial advisor for **Christine Brasic** (2022-2023)
- PhD students:
 - **Aaron Li** (2021-present)
 - **Naomi Burks** (2020-present)
 - **Einar Gunnarsson** (2022, co-advisor)
 - **Katie Storey** (2018).
 - **Danika Lindsay** (2018).
 - **Junfeng Zhu** (2018, co-advisor).
- Postdocs:
 - **Einar Gunnarsson** (UMN Mathematics, 2022-2023)
 - **Anna Kraut** (UMN Mathematics, 2020-present)
 - **Kamran Kaveh** (UMN Mathematics, 2015)
 - **Michael Kelly** (UMN Mathematics, 2012-2013)
- AWM Mentor Network (ongoing)
- F-GAP Mentor (ongoing)
- SMB Mentor (2021) Career mentoring during SMB conference for students and junior researchers in mathematical sciences.
- Thesis committee: Yuhang Liu (Industrial and Systems Engineering), A. Miller (Mathematics), P. Campbell (Mathematics), Catherine Lee (Biostatistics and Computational Biology), Asha Nair (Biostatistics and Computational Biology), Niranjan Natekar (Electrical Engineering), Krishanu Sen (Aerospace Engineering), Junfeng Liu (Industrial and Systems Engineering), Bryan Felix (Mathematics), Zicheng Wang (Industrial and Systems Engineering)

SERVICE TO
DEPARTMENT

- Associate Dept. Head (Jan 2021-present)
- Hiring Task Force (chair), to develop equitable and inclusive hiring procedures in mathematics (summer 2020)
- Faculty Search Committee and Diversity Committee (2019-2020)
- Instructional Evaluation Committee and Computer Committee (2017-2018)
- Department Head Search Committee (2017-2018)
- Institute for Mathematics and its Applications committee (2016-2017)
- Organizer of UMN Applied and Computational Math Colloquium (w/Doug Arnold) (2016-2018)
- Organizer of UMN Math Biology seminar (2011-present, sporadic) (w/Hans Othmer)
- Visitor committee (2016-2017)
- Instruction evaluation and MCFAM committee (2015-2016)
- Newsletter and MCFAM (2013-2014)
- Computer and instruction evaluation committee (2012-2013),

SERVICE TO
UNIVERSITY

- Executive Committee for UMN Data Science Initiative (2022-present)
- UMN Faculty Senator for College of Science and Engineering (2017-2020, 2020-2023)
- Hiring Committee for Industrial and Systems Engineering (2020-2021)
- UMN College of Science and Engineering Merit Scholarship Reviewer (2019, 2020)
- Internal grant reviewer for Simons Foundation grants (2014).

- Reviewer of undergraduate research proposals for College of Science and Engineering (2019, 2020).

SERVICE TO
SCIENTIFIC
COMMUNITY

Editorial work

- Editorial Board, Nonlinearity (2023-present)
- Editorial Board, NPJ Systems Biology and Applications (2023-present)
- Editorial Board, Computational and Systems Oncology (2020-present)
- Guest Editor, PLoS Computational Biology (occasional, 2017-present)
- Editorial Board, Mathematical Biosciences (2022-2023)
- Associate Editor, Mathematical Biosciences and Engineering (2017-2022)
- Associate Editor, Journal of Biological Dynamics (2019-2023)

American Math Society (AMS) Central Section Program Committee (2023-2025); committee chair 2024-2025

Association for Women in Mathematics, Selection Committee for Alice T. Schaefer Prize (2017-2020, chair in 2020)

Grant reviews and selection committees

- NSF Division of Mathematical Sciences, review panel (2023)
- NSF Division of Mathematical Sciences, ad hoc reviewer (2022)
- French National Cancer Institute, reviewer (2022)
- Department of Energy Computational Science Graduate Fellowship screening and selection committee (2010-2022)
- NSF Division of Mathematical Sciences (2020)
- NIH NCI, Physical Sciences-Oncology U01 review panel (2019)
- Wellcome Trust UK grant review (2018)
- NSF Division of Mathematical Sciences review panel (2017)
- NIH Informatics Technology in Cancer Research panel (2017)
- NIH Modeling and Analysis of Biological Systems review panel (2016)
- NSF Division of Mathematical Sciences review panel (2016)
- NIH review panel, Integrative Cancer Biology Program (2015)
- NIH review panel, Physical Sciences Oncology Centers (2015)
- NSF Division of Mathematical Sciences review panel (2014)

Conference organization

- Fields Institute, Program on Ecology and Evolution of Cancer (2024), scientific committee
- Institute for Mathematics and its Applications (IMA), Workshop on Plasticity and Epigenetics in Cancer, University of Minnesota, (Spring 2021)
- Midwest Probability Colloquium, University of Chicago (Fall 2020)
- Institute for Mathematics and its Applications Workshop on Tumor Microenvironment (Spring 2020)
- European Conference for Mathematical and Theoretical Biology, Minisymposium on Cancer Modeling, (Fall 2020)
- Centre International de Rencontres Mathématiques, Program on Mathematical Biology, Marseille, (2020). (scientific committee)
- Math Alliance Field of Dreams Conference 2019, co-organizer (2019).

- Workshop on ‘*In silico* Modeling in Medicine.’ University of Oslo, (2019)
- Workshop on ‘Multiscale Modeling in Biology,’ UMN, (May 2019). (Hans Othmer’s birthday)
- Workshop for Women in Mathematical Biology, IMA, (May 2018)
- Workshop on Randomness in Biology, American Institute for Mathematical Sciences - Dynamical Systems, Taipei, (2018)
- International Centre for Mathematical Sciences workshop on ‘Spatial models of evolving populations,’ Edinburgh, (2018)
- IMA workshop on ‘Innovative Statistics in Precision Medicine,’ (2017)
- Invited session on Stochastic Models of Cancer, Bernoulli conference, Toronto (2016)
- Workshop on Ecology of Cancer at Mathematical Biosciences Institute, (Sept 2014)
- European Conference for Mathematical and Theoretical Biology, Workshop on Spatial models of cancer, Sweden, (Jun 2014)
- Minisymposium on Stochastic and Multiscale modeling in biology, AMS Sectional Iowa State, (2013)
- Invited session, Stochastic models of cancer, World Congress in Probability and Statistics, Istanbul (2012)
- Minisymposium on mathematical biology of cancer for International Congress for Industrial and Applied Mathematics, Vancouver (2011)

Panels (organization and participation)

- Sunway International School (Malaysia), Career Week panelist, 2020.
- UMN Women in Mathematics group, panelist/presenter (2020, 2021)
- Organized panel on careers in mathematical biology, UMN Women in Math Biology Conference (2017)
- AWM research symposium, panelist on career paths (2013)
- Koc University, Pre-World Congress Meeting of Young Researchers in Probability and Statistics, career paths panelist / speaker (July 2012)

External evaluation

- External evaluator in faculty search, University of Bonn, Mathematics department (2018, 2020)
- External PhD examiner, University of Edinburgh (Michael Nicholson) Mathematics (2018)
- External promotion and tenure evaluations (various)

Refereeing

Numerous papers reviewed for journals including:

Nature Communications, Nature Ecology and Evolution, Proc. National Academy of Sciences, Annals of Applied Probability, Journal of Computational Physics, SIAM Review, SIAM Applied Math, SIAM Journal of Scientific Computing, Communications in Computational Physics, Journal of Mathematical Biology, Journal of Fluids and Structures, Journal of Scientific Computing, Public Library of Science (PLoS) Biology, PLoS Computational Biology, Journal of Theoretical Biology, Integrative Biology, Physical Biology, Theoretical Population Biology, PLoS ONE, Proceedings of Royal

Society Interface, Mathematical Biosciences and Engineering, IEEE Transactions on Biomedical Engineering, BMC Evolutionary Biology, Cancer Research.

Other service

- Workshop proposal review, Banff International Research Station (BIRS) (2021)
- Representative for Society for Industrial and Applied Math (SIAM) at Coalition for National Science Foundation lobbying event. Capitol Hill, Washington DC (2013).
- Invited contributor to the National Academy of the Sciences: Report on Convergence in Life Sciences (2013).
- MBI Institute Partner meeting (Feb 2012).

SELECTED K-12 OUTREACH ACTIVITIES

- Developed high school summer internship program in data science + epidemiology for students (with Jeff Calder), summer 2023.
- Discover STEM (2015-present) Lead sessions during summer on applied mathematics in biology and medicine for rising seniors in high school
- EUREKA (2015-present) Lead sessions during summer for middle and high school girls on mathematical modeling of cancer, modeling of infectious diseases, radiation treatment optimization.
- Run the World (summer 2022): Organized and ran a week long camp for high school students on machine learning/epidemiology
- Solve it! Mathematics in Biology and Medicine (2014-2017) Organized and ran a week long camp for high school students on mathematical biology/medicine
- Minnesota Program for Mathematics, participant in panel/presenter (2018,2021)
- Sunway International School (Malaysia), Career Week panel, 2020.
- High school student shadowing, Meghan Cahill, Buffalo High School, Oct 2016
- Math excursions at Carver Elementary 4th grade (2014).
- Boston Scientific High School student program (July 2012).

PROFESSIONAL DEVELOPMENT

Trainings through Office of Equity and Diversity

- Inclusivity in teaching training (June 2023)
- Workshop on Navigating Challenging Conversations (June 2023)
- Microaggressions and Implicit Bias (Nov 2018)