CSU San Marcos   `kayers@csusm.edu`
Department of Mathematics
333 Twin Oaks Valley Rd.
San Marocs, CA 92078

EDUCATION

Ph.D. in Mathematics, Iowa State University   2015
Dissertation: **Graph Determined Symbolic Dynamics and Hybrid Systems**.
Adviser: Dr. Wolfgang Kliemann

B.A. in Mathematics, Bowdoin College, Brunswick, Maine   2010
Honors Thesis: "Stochastic Perturbations of the Fitzhugh-Nagumo Equations"
Adviser: Dr. Mary Lou Zeeman.

EMPLOYMENT

Assistant Professor, California State University San Marcos   2021 - present
Assistant Professor, Carroll College   2019 - 2021
Visiting Assistant Professor, Pomona College   2016 - 2019

HONORS AND AWARDS

Project NExT Fellow, Peach '18 Cohort   2018-2019
Aggie Ho Research Award, Iowa State University   2015
Graduate College Research Excellence Award, Iowa State University   2014
Edward S. Hammond Prize, Mathematics Department, Bowdoin College   2010
Graduated with Honors, Mathematics Department, Bowdoin College   2010

PUBLICATIONS AND PAPERS

8. K. Ayers, P. Hinow, A. Radunskaya. "Stabilization of quasi-periodic orbits of the random logistic map." In preparation.

7. K. Ayers, A. Radunskaya. 'Stability of the invariant distribution of the stochastic logistic map." Submitted, January 2024.

6. K. Ayers, D. Dmitrishin, A. Radunskaya, A. Stokolos. "Search for invariant sets of the generalized tent map." Accepted in *Journal of Difference Equations and Applications*, 2022.

5. K. Ayers. "Chain Recurrence in Graph Determined Hybrid Systems". *Journal of Dynamics and Control Systems* (2019). https://doi.org/10.1007/s10883-019-09440-x

4. H. Cho, K. Ayers, L. de Pillis, Y-H. Kuo, J. Park, A. Radunskaya, R. Rockne. "Modeling acute myeloid leukemia in a continuum of differentiation states." *Letters in Biomathematics*, 5(sup1): S69-S98, 2018.

3. K. Ayers. "Graph Determined Symbolic Dynamics and Hybrid Systems," Ph.D. dissertations, Iowa State University: ProQuest/UMI, 2015

2. J. Ackerman, K. Ayers, E. Beltran, J. Bonet, D. Lu, T. Rudelius. " A behavioral characterization of Markov chains and discrete time dynamical systems over directed graphs." *Qualitative Theory of Dynamical Systems*, 13(1):161-180, 2014.

1. K. Ayers, X. Garcia, J. Kunze, T. Rudelius, A. Sanchez, S. Shao, E. Speranza. "Limit and Morse sets of deterministic hybrid systems." *Qualitative Theory of Dynamical Systems*, 12(2):335-360, 2013.

Grants and Fellowships

AMS PUI Travel Grant	2023
Joint Mathematics Meetings	$2100
Co-PI	

AMS PUI Travel Grant	2022
Joint Mathematics Meetings - on hold	$2,100

NIH Research Enhancement Award (R15)	2021-2024
Title: "The Architecture of Missing and Archaic Variation in Human Population Genomic Data"	
Co-PI	$440,087

AIM Math Community	2020-present
"Little School Dynamics - A Dynamical Systems Community Projects for Researchers at PUIs"	
Co-PI	

Professional Presentations

"Stability of the invariant distribution of the stochastic logistic map"	2024
JMM AIM Special Session on Little School Dynamics: Cool Research Done at PUIs	

"Stability of the invariant distribution of the stochastic logistic map"	2023
CSU Mathematical Sciences Conference	

"A Chaotic Introduction"	2023
Route 78 Math Day	

"Search for invariant sets of the generalized tent map"	2023
JMM AIM Special Session on Little School Dynamics: Cool Research Done at PUIs	

"An Exploration of Sharkovskii's Theorem"	2022
University of San Diego Invited Colloquium Talk	

"Baby Sharkovskii"   2022
San Marcos Informal Mathematics In-Person Colloquium

"Selected Topics in Hybrid Systems"   2022
Invited Talk, Boston Computing Group

"Random Perturbations of Self-Regulating Biological Processes"   2022
JMM AWM Special Session on Women in Mathematical Biology

"Harris Irreducibility of the Stochastic Logistic Map"   2022
JMM AMS Special Session on Little School Dynamics: Cool Research done at PUIs

"Fixed Points, Stability, and Oscillations: How can we manipulate systems?"   2022
Invited Colloquium Talk, Cal State Long Beach

"Fixed Points, Stability, and Oscillations: How can we manipulate systems?"   2022
Invited Colloquium Talk, Skidmore College

"Little School Dynamics - Research at PUIs"   2022
Invited Talk, SIMIODE Expo

"Random Perturbations of Self-Regulating Biological Processes"   2021
UCSD NITMB Colloquium

"Fixed Points, Stability, and Oscillations: How can we manipulate systems?"   2021
San Marcos Mathematics Online Colloquium

"Stochastic Logistic Maps and Invariant Distributions"   2021
Invited Graduate Seminar, University of Georgia

"Stochastic Perturbations of Unimodal Maps"   2021
Invited Colloquium Talk, Cal State San Marcos

"Perceiving Patterns and Chaos"   2021
Cal State San Marcos Student Seminar

"Random Perturbations of Unimodal Maps"   2021
AIM Math Community - Little School Dynamics Invited Talk

"Faculty Dynamics Research Opportunities - Primarily Undergraduate Institutions"   2021
Invited Panel, SIMIODE Expo

"Stabilization of Quasi-Periodic Orbits of the Random Logistic Map"   2020
Invited Talk, Women in Math in Southern California Conference

"Chain Recurrence in Graph Determined Hybrid Systems"   2020
MAA Contributed Paper Session, Joint Mathematics Meetings 2020

"A Skew Product Model for Hybrid Dynamical Systems"   2019
Invited Colloquium Talk, University of Montana

"Stochastic Perturbations of the Logistic Map."   2019
MAA Invited Paper Session, MathFest 2019

"Perceiving Patterns and Chaos"   2019
Invited Colloquium Talk, Carroll College

"A Skew Product Model for Hybrid Dynamical Systems" 2018
Invited Colloquium Talk, California Polytechnic Institute, Pomona

"A Chaotic Introduction" 2018
Claremont Math Weekend, Claremont, CA

"Perceiving Patterns and Chaos" 2017
Invited Colloquium Talk, Colorado College

"Perceiving Patterns and Chaos" 2017
Invited Colloquium Talk, Lafayette University

"Perceiving Patterns and Chaos" 2017
Invited Colloquium Talk, Agnes Scott College

"Skew Product Flows and Hybrid Systems" 2017
Applied Mathematics Seminar, Pomona College, CA

"Skew Product Flows and Hybrid Systems" 2017
Women in Math in Southern California Conference, Los Angeles, CA

"Symbolic Dynamics and Deterministic Hybrid Systems" (poster) 2015
Joint Mathematics Meetings, San Antonio, TX

"Symbolic Dynamics and Deterministic Hybrid Systems" 2013
Mathematics Colloquium, University of Augsburg, Augsburg, Germany

Other Presentations

"Panel Industry and Research in CSTEM" 2022
Associated Students Inc. Invited Panelist

"STEM and Twitter" 2022
CSUSM oSTEM Chapter Presentation

"The Math of Climate Science" 2022
Climate Teach in, CSUSM, CA

"Queering Math" 2018
Mathematics Community Seminar, Department of Mathematics, Pomona College, CA

"Queering Math" 2017
FoRCES Reading Group, Pomona College, CA

Professional Workshops

Harvard Master Class Teaching Math Modeling for Life Science   Summer 2023
Teaching Math Modeling for Life Science   Funded Senior Participant

CSUSM Faculty Learning Community Contemplative Pedagogy for Social Justice   Fall 2021
Contemplative Pedagogy for Social Justice   Accepted Participant

ICERM Virtual Workshop   June 2021
Advanced Workshop in Data Science for Mathematical Sciences Faculty   Accepted Participant

MAA Virtual Workshop   April 2021
How and Why Should Sustainability Be Part of What We Teach?   Accepted Participant

Joint Mathematics Meetings, Denver, CO   January 2020
AWM Workshop: Moving Toward Action   Funded Participant

Joint Mathematics Meetings, Baltimore, MD   January 2019
MAA Minicourse: Start Teaching Statistics using R and RStudio   Funded Participant

Mathematical Association of America MathFest 2018, Denver CO   August 2018
Project NExT Participant   Funded Participant

Iowa State University   Summer 2009
NSF-Sponsored REU Program   Funded Participant

CSUSM Professional Service

Academic Senate   2023-present
Senator representing CSTEM

San Marocs Informal Mathematics In-person Colloquium (SMIMIC)   2023-present
Co-Coordinator

Math 132 Community of Practice   Fall 2023
Tenure-Track Faculty Participant

Faculty Center Teaching and Learning Group   2022-present
Group member

Mathematics Department Reid Lecture Committee Member	2022 - present
AWM Student Chapter Faculty Advisor	2021 - present
oSTEM Chapter Faculty Advisor	2021 - present
Committee to create a new life sciences calculus Committee Member	Summer 2022
Cal-Bridge Program Cal State Mentor	2022 - 2023
2021-2022 Math Department Search, Tenure Track Line Search Committee Member	2021-2022
Math 132: Survey of Calculus Lead Instructor	2021-2022

Other Professional Service

AWM Executive Committee Social Media Coordinator	2024 - present
MAA SoCal-Nevada Section Vice Section Chair	2023-2026
SIAM Conference on Applications of Dynamical Systems Mini-Symposium Organizer	2023
AMS Special Session, JMM 2023 Organizer	2023
CSU JMM, CSU Northridge Plenary Talk Chair	2022
Johns Hopkins University Press, Kyne Santos Untitled Book Book Reviewer	2022

CSU JMM Scientific Committee   2022
Committee Member

AMS Special Session, JMM 2022   2022
Organizer

AMS Math Reviews   2020-present
Reviewer

AWM Media Committee   2019-present
Member

Pomona Academy for Youth Success (PAYS)   2017 - 2021
Math Instructor

Carroll College Safe Zone Training   2021
Co-Facilitator

AWM The First Fifty Years: Reminiscences, Participant History, and Visions for the Future 2020
Article Referee

Carroll College Math Debate   2020
Debater: Who is the most influential mathematician who died young? (Debate Winner Representing Srinivasa Ramanujan)

AMS Social, JMM 2020   2020
Performer, Violinist

JMM MAA Workshop: Identifying and Managing Microaggressions in the Academic Setting 2020
Small group discussion facilitator

EDGE (Enhancing Diversity in Graduate Education)   2019
MATLAB Mini Course Instructor

Project NExT Session on Math Education at 2019 JMM   2019
Facilitator

AWM Strategic Task Force on Diversity and Inclusion   2018
Committee Member

Pomona College 1st Annual Sonia Kovalevsky Day   2018
Organizer

Nebraska Conference for Undergraduate Women in Mathematics   2013
Invited Panelist, Life in Graduate School

Bowdoin College Student Math Representative   2009-2010

Media Appearances

LGBTTech   2022
PATHS In-Person Networking Event Invited Panelist

My Favorite Theorem   2022
Podcast Guest

LGBTTech   2022
PATHS Program Interview

Undergraduate Student Projects

Haley Lorenz and Carmen Gutierrez   Summer 2023
"Visualizing the Invariant Distribution of the Stochastic Logistic Map"

Elisa Zepeda   2020-2021
"Random Forests for Prenatal Maternal Data"

Eisen Ipac   2018-2019
"Population dynamics in crime dynamics modeling"

Benjamin Gregory   2017-2018
"Symbolic dynamics of Smale's horseshoe"

Abigail Gardner   2016-2017
"Variation of parameters in crime dynamics modeling"

Master's Student Thesis Projects

Alireza Pakravan   2021-2022
"Solving PDEs Using Neural Networks"

Courses Taught

CSUSM:
Math 132 – Survey of Calculus (Fall 2021, Spring 2022)
Math 346 – Mathematical Methods of Physics (Fall 2021)
Math 350 – Foundations for Theoretical Mathematics (Fall 2022, Spring 2023, Fall 2023)
Math 362 – Differential Equations (Spring 2022)
Math 430 – Real Analysis (Spring 2023, Fall 2023)
Math 448 – Mathematical Methods in Biology (Fall 2022)
Carroll College:
Math 121 – Differential Calculus (Fall 2019, Fall 2020)
Math 122 – Integral Calculus (Spring 2020, Spring 2021)
Math 207 – Introduction to Statistics (Fall 2019, Spring 2020, Spring 2021)
Math 233 – Multivariable Calculus (Fall 2019, Fall 2020)
Math 306 – Real Analysis (Spring 2020, Spring 2021)
Math 401 – Abstract Algebra and Modern Geometry (Fall 2020)
Pomona College:
Math 30 – Differential Calculus (Spring 2018)
Math 31 – Integral Calculus (2 sections, Fall 2016, Fall 2018)
Math 32 – Multivariate Calculus (2 sections, Spring 2017, Fall 2017)
Math 58 – Introduction to Statistics (Spring 2019)
Math 60 – Linear Algebra (Fall 2017, Spring 2018)
Math 101 – Introduction to Real Analysis (Fall 2018, Spring 2019)
Math 102 – Differential Equations with Modeling (Fall 2016)

Professional Memberships

American Mathematical Society
Mathematical Association of America
Association for Women in Mathematics
National Association of Mathematicians
SACNAS
Spectra

Computer Skills

Python
R
LaTeX
MATLAB
Mathematica
Git