Stephen A. Wirkus
Curriculum Vitae
March 2, 2016

School of Mathematical and Natural Sciences
New College of Interdisciplinary Arts and Sciences
Arizona State University at the West Campus

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Fields of Interest: Mathematical Biology, Differential Equations, Dynamical Systems, Mathematical Modeling, Numerical Methods

Education:

August 1999	Ph.D. in Applied Mathematics, *Cornell University, Ithaca, NY,* Advisor: Richard Rand.
August 1997	M.S. in Applied Mathematics, *Cornell University, Ithaca, NY.*
May 1994	B.S. in Mathematics, With Honors, With Distinction, *University of Missouri–Kansas City.*
May 1994	B.S. in Physics, With Honors, With Distinction, *University of Missouri–Kansas City.*

Academic Positions:

2015–present	Interim Associate Director, School of Mathematical & Natural Sciences, Arizona State University (ASU)
2013–present	Sun Devil Family Association Professor, Arizona State University (ASU)
2007–present	Associate Professor, School of Mathematical & Natural Sciences, Arizona State University (ASU)
2008–2015	Affiliate Faculty Member, Mathematical, Computational and Modeling Sciences Center (MCMSC), ASU
2013–2014	Dr. Martin Luther King Jr. Visiting Associate Professor, Department of Mathematics, Massachusetts Institute of Technology (MIT)
Summers 2011–2013	Co-Executive Director, Mathematical & Theoretical Biology Institute (MTBI), ASU
2008–2010	Research Faculty, MTBI, ASU
2007–2010	Adjunct Associate Professor, Department of Mathematics and Statistics, California State Polytechnic University, Pomona (Cal Poly Pomona)
2005–2007	Associate Professor, Department of Mathematics and Statistics, Cal Poly Pomona
2005–2007	Co-Director, Applied Mathematical Sciences Summer Institute (AMSSI), Cal Poly Pomona & Loyola Marymount University
2004, July	Visiting Faculty, Biomathematics summer program, Hope College
2003, Fall	Visiting Scholar, Center for Nonlinear Studies, Los Alamos National Laboratory (LANL)
2001–2004	Adjunct Assistant Professor, Department of Biological Statistics

	and Computational Biology, Cornell University
2000–2005	Assistant Professor, Department of Mathematics and Statistics, Cal Poly Pomona
2000, Spring	Visiting Assistant Professor, Department of Mathematics, Cornell University
1999, Fall	Teaching Associate; Department of Mathematics, Cornell University
1999–2003	Summer Director, MTBI, Cornell University

Awards:

2015	Grand Marshal, New College of Interdiscplinary Arts & Sciences Convocation
2013	ASU Professor of the Year, Sun Devil Family Association
2011	AGEP Mentor of the Year (NSF Alliances for Graduate Education and the Professoriate program) for the Compact for Faculty Diversity Institute on Teaching and Mentoring, the Southern Regional Education Board (SREB)
2002, 2003 2009, 2011	Mentoring Recognition Award, Mathematical and Theoretical Biology Institute
2006	Leader in Undergraduate Research Citation, National Security Agency
2000	Mentoring Recognition Award, Blackwell/Tapia Distinguished Lecture Series

Peer Reviewed Publications (journal):

21. E. Camacho, A. Radulescu, S. Wirkus, "Bifurcation Analysis of a Photoreceptor Interaction Model for Retinitis Pigmentosa," *Communications in Nonlinear Science and Numerical Simulation*, accepted 2/2016.

20. S. Wirkus, E. Camacho, P. Marshall, "Mathematical modeling of fungal infection in immune compromised individuals: The Effect of back mutation on drug treatment," *Journal of Theoretical Biology*, 385: 66-76, 2015.

19. E.Camacho, L.Melara, C.Villalobos, S.Wirkus, "Optimal Control in the Treatment of Retinitis Pigmentosa," *Bulletin of Mathematical Biology*, 76(2): 292-313, 2014.

18. E. Camacho, C.Kribs-Zaleta, S.Wirkus, "Metering Effects in Population Systems," *Mathematical Biosciences and Engineering*, 10(5-6):1365-1379, 2013.

17. E. Camacho, S.Wirkus, "Tracing the Progression of Retinitis Pigmentosa via Photoreceptor Interactions," *Journal of Theoretical Biology*, 317: 105-118, 2013.

16. E. Camacho, S. Wirkus, P. Marshall, "Mathematical modeling of fungal infection in immune compromised individuals: Implications for drug treatment," *Journal of Theoretical Biology*, 281(1): 9-17, 2011.

15. F. Berezovskaya, S. Wirkus, B. Song, C. Castillo-Chavez, "Dynamics of population communities with prey migrations and Allee effects: a bifurcation approach," *Mathematical Medicine and Biology*, 28(2): 129-152, 2011.

14. E. Camacho, M. Colon-Velez*, D. Hernandez*, U. Rodriguez-Bernier*, J. van Laarhoven*, S. Wirkus, "A Mathematical Model for Photoreceptor Interactions," *Journal of Theoretical Biology*, 267(4): 638-646, 2010.

13. N. Crisosto*, C. Kribs-Zaleta, S. Wirkus, C. Castillo-Chavez, "Community Resilience in Collaborative Learning," *Discrete and Continuous Dynamical Systems - Series B*, 14(1): 17-40, 2010.

12. D. Daugherty*, T. Roque-Urrea*, J. Urrea-Roque*, J. Troyer*, S. Wirkus, M. Porter, "Mathematical Models of Bipolar Disorder," *Communications in Nonlinear Science and Numerical Simulation*, 14(7): 2897-2908, 2009.

11. S. Wirkus, M. Porter, "Comment on 'Bifurcation analysis of parametrically excited bipolar disorder model'," *Communications in Nonlinear Science and Numerical Simulation*, 14(6): 2844, 2009.

10. F. Berezovskaya, E. Camacho, S. Wirkus, G. Karev, "Traveling Wave Solutions of Fitzhugh model with Cross-diffusion," *Mathematical Biosciences and Engineering,* 5(2): 239-260, 2008.

9. J. Abiva*, E. Camacho, E. Joseph*, A. Mikaelian*, C. Rogers*, J. Shelton, S. Wirkus, "Alcohol's Effect on Neuron Firing," *The Mathematical Scientist*, 32(1): 32-40, 2007.

8. S. Wirkus, R. Swift, J. Switkes, "On Highway Relativity," *The Mathematical Scientist*, 31(2): 132-133, 2006.

7. S. Wirkus, "Approximating the Time Delay in Coupled van der Pol Oscillators with Delay Coupling," *Stochastic Processes and Functional Analysis: a volume of recent advances in honor of MM Rao*, Marcel Dekker, pp. 483-491, 2004.

6. J. Switkes, S. Wirkus, I. Mihaila, R. Swift, "On the Means of Deterministic and Stochastic Populations," *The Mathematical Scientist*, 28(2): 91-98, 2003.

5. R. Swift, J. Switkes, S. Wirkus, "Perceived Highway Speed," *The Mathematical Scientist*, 28(1): 28-36, 2003.

4. S. Wirkus, R. Rand, "The Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling," *Nonlinear Dynamics*, 30(3): 205-221, 2002.

3. S. Wirkus, R. Rand, A. Ruina, "How To Pump a Swing," *College Mathematics Journal,* 29(4): 266-275, 1998.

Peer Reviewed Mentoring Publications (journal):

2. E. Camacho, R. Holmes, S.Wirkus, "Transforming the Undergraduate Research Experience Through Sustained Mentoring: Creating a Strong Support Network and a Collaborative Learning Environment," *New Directions for Higher Education*, 171: 63-73, 2015.

1. E. Camacho, C.Kribs-Zaleta, S.Wirkus, "The Mathematical and Theoretical Biology Institute—a Model of Mentorship Through Research," *Mathematical Biosciences and Engineering*, 10(5-6):1351-1363, 2013.

Books:

S. Wirkus, R. Swift, R. Szypowski, *A Course in Differential Equations with Boundary Value Problems, 2nd Edition*, Chapman & Hall/CRC Press, Boca Raton, FL, (under contract; expected publishing date: 12/2016).

S. Wirkus, R. Swift, *A Course in Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC Press, Boca Raton, FL, 807 pages, 2015.

R. Swift, S. Wirkus, *A Course in Ordinary Differential Equations,* Chapman & Hall/CRC Press, Boca Raton, FL, 667 pages, 2006.

Solution Manuals:

S. Wirkus, R. Swift, Solution Manual for *A Course in Ordinary Differential Equations, 2nd Edition*, 299 pages, Chapman & Hall/CRC Press, 2015.

R. Swift, S. Wirkus, Solution Manual for *A Course in Ordinary Differential Equations*, 245 pages, Chapman & Hall/CRC Press, 2007.

Peer Reviewed Publications (non-journal):

R. Swift, J. Switkes, S. Wirkus, "Analysis of the Game 'Cover-Up' and Its Variations," *The Mathematical Spectrum*, 42(2): 64-69, 2010.

S. Wirkus, R. Rand, "Bifurcations in the Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling," *Proceedings of the DETC'99, ASME Design Engineering Technical Conferences, Sept 13-16, 1999, paper no. DETC99/VIB-8318.*

S. Wirkus, R. Rand, "Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling," *Proceedings of the DETC'97, ASME Design Engineering Technical Conferences, Sept 14-17, 1997, paper no. DETC97/VIB-4019.*

Non-Peer Reviewed Mentoring Articles:

E. Camacho, S. Wirkus, "The Applied Mathematical Sciences Summer Institute," in Gallian, J. (Ed.), *Proceedings of the Conference on Promoting Undergraduate Research in Mathematics*, pp. 9-14. American Mathematical Society, 2007.

Grants (as Principal Investigator [PI]):

Enhancement of the Mathematics Component of the 2009-2010 SACNAS Conferences, National Science Foundation $238,740, DMS-0935993, 6/2009-5/2011, co-PIs E.Camacho, A.Gallegos.

Enhancement of the Mathematics Component of the 2009-2010 SACNAS Conferences, National Security Agency, $194,937, 7/2009-11/2010, co-PIs E.Camacho, A.Gallegos.

Enhancement of the Mathematics Component of the 2008 SACNAS Conference, National Security Agency, $249,072, H98230-08-1-0114, 7/2008-11/2008, co-PI E.Camacho.

REU Site: Applied Mathematical Sciences Summer Institute (AMSSI), National Science Foundation, $511,419, DMS-0453602, 4/2005-3/2008, co-PI R.J.Swift,

Applied Mathematical Sciences Summer Institute (AMSSI), National Security Agency, $75,000, MSPF-04IC-227, 3/2005-2/2006, co-PIs E.Camacho, E.Mosteig, R.J.Swift.

Grants (as co-PI):

International Research Experience for Students (IRES) Project Proposal: Population Dynamics and Complex Systems: Challenges and Opportunities, National Science Foundation, $179,936, DMS-1261211, 10/2013-9/2016; PI C.Castillo-Chavez, co-PI E.Camacho,G.Chowell-Puente,S.Wirkus.

Arizona State University GAANN Fellowships in Applied Mathematics in the Life and Social Sciences, Graduate Assistance in Areas of National Need (GAANN), Department of Education, $399,798, P200A120192, 8/2012-8/2015; PI C.Castillo-Chavez, co-PIs E.Camacho, S.Suslov, S.Wirkus.

REU Site: Mathematical and Theoretical Biology Institute (MTBI), National Science Foundation, $540,000, DMS-1263374, 5/2013-4/2018; PI E.Camacho, co-PI S.Wirkus; stepped down as co-PI 5/2014.

Mathematical and Theoretical Biology Institute (MTBI), National Security Agency, $150,000, MSPF-RE-13-MTBI-0513-asu-2-2-121012, 5/2013-4/2014; PI C.Castillo-Chavez, co-PIs E.Camacho, S.Wirkus.

Applied Mathematical Sciences Summer Institute (AMSSI), National Security Agency, $254,653, MSPF 07IC-043, 3/2007-2/2009, PI E.Camacho, co-PIs E.Mosteig, R.J.Swift, S.Wirkus.

Applied Mathematical Sciences Summer Institute (AMSSI), National Security Agency, $115,000, MSPF 06IC-022, 3/2006-2/2007, PI E.Camacho, co-PIs E.Mosteig, R.J.Swift, S.Wirkus.

Non-Peer Reviewed Publications:

12. W. Caldwell*, B. Freedman*, L. Settles*, M. Thomas*, A. Murillo, E. Camacho, S. Wirkus, "Substance Abuse via Legally Prescribed Drugs: The Case of Vicodin in the United States," *Arizona State University Mathematical, Computational & Modeling Sciences Center Technical Report, MTBI-10-02M,* `http://mtbi.asu.edu/research/archive`, 2013; also Cornell University Library arXiv, `http://arxiv.org/pdf/1308.3673.pdf`.

11. B. Burgett*, M. Rodriguez*, S. Ryan*, W. Tressel*, O. Patterson, S. Wirkus, "Within-Host Dynamics of Antibiotic Resistance in Gonorrhea," *Arizona State University Mathematical, Computational & Modeling Sciences Center Technical Report, MTBI-09-05M,* `http://mtbi.asu.edu/research/archive`, 2012.

10. J. Ames*, A. Feiler*, G. Mendoza*, A. Rumpf*, S. Wirkus, "Determination of Tucson, Arizona as an Ecological Trap for Cooper's Hawks (*Accipiter cooperii*)," *Arizona State University Mathematical, Computational & Modeling Sciences Center Technical Report, MTBI-08-02M,* `http://mtbi.asu.edu/research/archive`, 2011.

9. C.Ambrose*, K.Larson*, J.Jones*, L.Orozco*, D.Uminsky, S.Wirkus, "A Mathematical Model of Political Affiliation," `http://www.public.asu.edu/~etcamach/AMSSI/`, 2007.

8. J. Hunt*, L. LaPlace*, E. Miller*, J. Pham*, E. Camacho, S. Wirkus, "A Continuous Model of Gene Expression," `http://www.public.asu.edu/~etcamach/AMSSI/`, 2005.

7. J.Abiva*, E.Camacho, E.Joseph*, A.Mikaelian*, C.Rogers*, J.Shelton, S.Wirkus, "Alcohol's Effect on Neuron Firing," `http://www.public.asu.edu/~etcamach/AMSSI/`, 2005.

6. D. Daugherty*, T. Roque-Urrea*, J. Urrea-Roque*, J. Snyder*, S. Wirkus, M. Porter, "Mathematical Models of Bipolar Disorder," `http://arxiv.org/abs/nlin.CD/0311032`, 2004.

5. D. Daugherty*, J. Urrea*, T. Roque*, S. Wirkus, "Models of Negatively Damped Harmonic Oscillators: the Case of Bipolar Disorder," *Cornell University Department of Biological Statistics and Computational Biology Technical Report, BU-1613-M,* `http://mtbi.asu.edu/research/archive`, 2002.

4. R. Hernandez*, D. Lyles*, D. Rubin*, T. Voden*, S. Wirkus, "A Model of Beta-cell Mass, Insulin, Glucose, and Receptor Dynamics with Applications to Diabetes," *Cornell University Department of Biological Statistics and Computational Biology Technical Report,*

BU-1579-M, `http://mtbi.asu.edu/research/archive`, 2001.

    3. N. Crisosto*, C. Castillo-Chavez, C. Kribs-Zaleta, S. Wirkus, "Who Says We R_0 Ready for Change, *Cornell University Department of Biological Statistics and Computational Biology Technical Report, BU-1586-M*, `http://mtbi.asu.edu/research/archive`, 2001.

    2. N. Anyadike*, O. Ortega*, A. Greenblatt*, M. Engman, S. Wirkus, "Evolution of Fluconazole Resistance in *Candida albicans," Cornell University Biometrics Unit Technical Report, BU-1528-M*, `http://mtbi.asu.edu/research/archive`, 2000.

    1. S. Wirkus, R. Rand, A. Ruina, "Modeling the Pumping of a Swing," *C*ODE*E Newsletter, Winter-Spring 1997.*

Selected Research Presentations:
"A Mathematical Model of Photoreceptor Death: Retinitis Pigmentosa and Retinal Detachment,"
      August 2015, Internat. Congress on Industr. & Applied Math. (ICIAM), Beijing, China
"Population Models in Biology,"
      October 2014, Institute of Interdisciplinary Research, Cayey, Puerto Rico
"Mathematical Models of Photoreceptor Interactions,"
      October 2014, Applied and Computational Math Seminar, ASU, Glendale, AZ
"Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neural Network Model,"
      July 2014, SMB Minisymposium, Osaka, Japan,
      July 2014, SIAM AN14 Minisymposium, Chicago, IL,
      Feb 2014, MLK Scholar Brown Bag Talk, MIT, Cambridge, MA.
"A Model of Photoreceptor Degeneration in Zebrafish Via a Cone Mutation,"
      August 2014, MathFest Minisymposium, Portland, OR,
      July 2013, SIAM AN13 Minisymposium, San Diego, CA.
"Numerical Solutions of Delay Differential Equations,"
      June 2011, MCMSC Mini-Workshop, ASU, Tempe, AZ,
      July 2004, Summer Colloquium, Hope College, Holland, MI,
      July 2003, Mathematical Epidemiology Tutorial, LANL, Los Alamos, NM.
"Mathematical Modeling of Fungal Infection in Immune Compromised Individuals: Implications for Treatment with Fungicidal Drugs,"
      April 2011, Los Arizona Days, University of Arizona, Tucson, AZ.
      July 2010, Society for Mathematical Biology (SMB) Conf, Rio de Janiero, Brazil.
"Dynamics of a bilocal (two-patch) population community,"
      June 2009, Summer Math Institute (SMI), Cornell University, Ithaca, NY.
"Some Applications of Mathematics,"
      February 2008, MGE@MSA, ASU.
"Modeling Molecular Systems with Differential Equations,"
      November 2007, Natural Science Week Conf, Univ. of Puerto Rico, Rio Piedras, PR.
"Gene Regulatory Network: A Continuous Nonlinear Model"
      September 2007, Dept. of Math BioMath Seminar, ASU, Tempe, AZ.
"An Epidemiological Model of Collaborative Learning,"

March 2007, Loyola Marymount University Math Colloquium, Los Angeles, CA.

"Evolution of Fluconazole Resistance in *Candida albicans*,"
> December 2003, Math Dept. Colloquium, Univ of New Mexico, Albuquerque, NM,
> July 2003, SIAM Annual Meeting, Montreal, Canada.

"Who Says We R_0 Ready for Change,"
> July 2002, SIAM Annual Meeting, Philadelphia, PA.

"Approximations of a Time Delay,"
> January 2002, AMS/MAA Annual Meeting, San Diego, CA.

"Complete Bifurcation Set of Two Coupled van der Pol Oscillators with Delay Coupling,"
> March 2000, Center for BioDynamics, Boston University, Boston, MA
> May 2000, David Blackwell / Richard Tapia Lecture Series, Ithaca, NY,
> March 2001, Loyola Marymount University, Los Angeles, CA.

"The Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling,"
> October 1998, Ford Foundation Annual Conference, Irvine, CA,
> October 1998, Center for Applied Math Student Talks, Ithaca, NY.

"Bifurcations in the Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling,"
> April 1999, Dept. of Applied Mathematics, University of Colorado at Boulder,
> May 1999, SIAM Annual Conference, Atlanta, GA.

"The Mathematics of Pumping a Swing,"
> October 1996, Ford Foundation Annual Conference, Irvine, CA,
> May 2002, Cal Poly Pomona, Pomona, CA.

"Unfolding a Degenerate Equilibrium,"
> October 1997, Center for Applied Math Student Talks, Cornell Univ, Ithaca, NY.

"Similarity Dimension and Fractals,"
> April 1995, Northeast Chapter SACNAS Conference, Ithaca, NY.

Selected Poster Presentations:

"Modeling Photoreceptor Interactions in the Presence of Retinitis Pigmentosa," The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, May 2012, Program#: 6438, Poster#: A331, Fort Lauderdale, FL.

Mentoring Activities:
Ph.D. Students Committee Chair (or Co-Chair)
• Wendy Caldwell, Applied Mathematics, ASU, Ph.D. expected: 5/2018.
• Maytee Cruz-Aponte, Applied Math for the Life and Social Sciences, ASU, "Epidemic Dynamics of Metapopulation Models," Ph.D. awarded: 5/2014.
• Edme Soho, Applied Math for the Life and Social Sciences, ASU, "Immune Response in the Study of Infectious Diseases (Co-Infection) in an Endemic Region," Ph.D. awarded: 12/2011.

Ph.D. Student Committee Member
• Beverly Gonzalez, Applied Mathematics for the Life and Social Sciences, ASU, "Using Statistical Model to Create Epidemiological Models," Ph.D. expected: 12/2014.

• Alicia Urdapilleta, Applied Mathematics for the Life and Social Sciences, ASU, "Theoretical Studies on a Two-Strain Model of Drug Resistance: Understand, Predict, and Control the Emergence of Drug Resistance," Ph.D. awarded: 5/2011.

Masters Student Committee Chair

• Gia Nguyen, Cal Poly Pomona Department of Mathematics and Statistics, "An Epidemiological Model of Collaborative Learning," M.S. awarded: 5/2008.

• Fayez Khoury, Cal Poly Pomona Department of Mathematics and Statistics, "Fitzhugh-Nagumo Equations," M.S. awarded: 5/2006.

• Mourshad Haider, Cal Poly Pomona Department of Mathematics and Statistics, "Mathematical Models of the SARS Epidemic," M.S. awarded: 5/2006.

• Cynthia Robles, Cal Poly Pomona Department of Mathematics and Statistics, "Filtering and Fourier Transforms," M.S. awarded: 5/2005.

Masters Student Committee Member

• Robert Fischer, Jr., Cal Poly Pomona Department of Mathematics and Statistics, "Stationary Processes and Bochner's Theorem," M.S. awarded: 3/2007.

• Margaret Bwogi, Cal Poly Pomona Department of Mathematics and Statistics, "A Study of the Effect of Improved Nutrition of an HIV-Infected System," M.S. awarded: 3/2006.

• Fahima Sadiq, Cal Poly Pomona Department of Mathematics and Statistics, "Some Topics in Functional Analysis," M.S. awarded: 9/2005.

• John Matthewson, Cal Poly Pomona Department of Mathematics and Statistics, "Arthropod-Borne Virus Transmission Models," M.S. awarded: 9/2005.

• Jody Shu, Cal Poly Pomona Department of Mathematics and Statistics, "Genetic Network Translation Using Neural Networks," M.S. awarded: 3/2005.

• Glen Armstrong, Cal Poly Pomona Department of Mathematics and Statistics, "Queues with Multiple Rate Changes," M.S. awarded: 9/2004.

• Sharyn Ly, Cal Poly Pomona Department of Mathematics and Statistics, "Birth-Death Processes with Polynomial Transition Rates," M.S. awarded: 9/2004.

• Flora Mulkey, Cal Poly Pomona Department of Mathematics and Statistics, "An Allee Birth-Death Process," M.S. awarded: 6/2004.

• Kuntel By, Cal Poly Pomona Department of Mathematics and Statistics, "An Introduction to the Foundations of the Bootstrap," M.S. awarded: 6/2004.

• Iva Chang, Cal Poly Pomona Department of Mathematics and Statistics, "Catastrophe Processes," M.S. awarded: 9/2003.

Undergraduate Projects Supervised (or Co-supervised)

"Mathematical Models in Pharmacokinetics/Pharmacodynamics (PK/PD)," Supervised Tim Bosley, Jonathon Burkow, Daniel El Wailey, Christopher Graham, Stephen Lacour, Kathryn Stefanko (ASU students), Spring 2016.

"Numerical Bifurcation Analysis on a Three-Dimensional System of a Fungal Infected Individual," Supervised Jonathan Burkow, Frank Scarpa (ASU students), Spring 2015.

"Substance Abuse via Legally Prescribed Drugs: The Case of Vicodin in the United States," Supervised Wendy K. Caldwell, Benjamin Freedman, Luke Settles, Michael M. Thomas (MTBI students), 2013.

"Mathematical Models of the Production of Melatonin," Supervised Amanda Auchana, Esteban Benitez, Matthew Kearns, Samantha Ryan (ASU students), Spring 2013.

"Mathematical Modeling Melatonin Levels," Supervised Marisa Mitchell, Samantha Ryan (ASU students), Fall 2012.

"Within-Host Dynamics of Antibiotic Resistance in Gonorrhea," Supervised Beverly Burgett, Marisabel Rodriguez, Samantha Ryan, William Tressel (MTBI students), 2012.

"A Model of Political Affiliation," Supervised Daniel Burkow, Cassondra Sutter (ASU students), 2011-2012.

"Determination of Tucson, Arizona as an Ecological Trap for Cooper's Hawks (*Accipiter cooperii*), Jouie Ames, Andrea Feiler, Giancarlos Mendoza, Adam Rumpf (MTBI students), Summer 2011.

"The Mathematics of Dynamic Social Networks," Supervised Robert Bahr (ASU student), 2010-2011.

"Mathematical Models of Gene Expression," Supervised Joseph Doggett (ASU student), 2009-2010.

"The Effects of Estrogen and Chemotherapy on the Dynamics of Invasive Carcinoma of Breast Cancer Patients," Supervised Cindy Jackson, Lindsey Lauderdale, Nicholas Millett, Samantha Smee, Adrian Smith (MTBI Students), Summer 2008.

"A Mathematical Model of Political Affiliation," Supervised Carol Ambrose, Kurt Larson, Jennifer Jones, Lucila Orozco (AMSSI students), Summer 2007.

"Alcohol's Effect on Neuron Firing," Supervised Charles Rogers, Jeannine Abiva, Edna Joseph, Arpy Mikaelian (AMSSI students), Summer 2005.

"A Continuous Model of Gene Expression," Supervised Elizabeth Miller, Jason Pham, Lissette LaPlace, Joseph Hunt (AMSSI students), Summer 2005.

"A Mathematical Model of Photoreceptor Interactions," Supervised Miguel Colon, Daniel Hernandez, Ubaldo Rodriguez-Bernier, Jon van Laarhoven (MTBI students), Summer 2003.

"The Phase Coupling of van der Pol Oscillators," Supervised: Darryl Daugherty (Undergraduate student at Cal Poly Pomona), 2002-2003.

"Models of Negatively Damped Harmonic Oscillators: the Case of Bipolar Disorder," Supervised: Darryl Daugherty, John Urrea, Tairi Roque (MTBI Students), Summer 2002.

"Who Says We R_0 Ready for Change," Supervised: Nicolas Crisosto (MTBI Student), Summer 2001.

"A Model of Beta-cell Mass, Insulin, Glucose, and Receptor Dynamics with Applications to Diabetes," Supervised: Ryan Hernandez, Danielle Lyles, Daniel Rubin, Thomas Voden (MTBI Students), Summer 2001.

"The Role of Time Delay in the Fitzhugh-Nagumo Equations: The Impact of Alcohol on Neuron Firing," Supervised: Romel Franca, Ivy Prendergast, Eva-Shirley Sanchez, Marco Sanchez (MTBI Students), Summer 2001.

"Evolution of Fluconazole Resistance in *Candida albicans*," Supervised: Nnaemeka Anyadike, Omayra Ortega, Aaron Greenblatt (MTBI Students), Summer 2000.

"Differential Equation Models of Neoadjuvant Chemotherapeutic Treatment Strategies for Stage III Breast Cancer," Supervised: Edith Aguirre, Nicolas Davidenko, Tametra Smith, Jennifer Stancil (MTBI Students), Summer 1999.

"Discussion of Difference Equation Model of Ventricular Parasystole as an Interaction Between Cardiac Pacemakers Based on the Phase Response Curve," Supervised: Nandi Leslie, Miriam Nuno, Alicia Simms Del Castillo (MTBI Students), Summer 1998.

"A Mathematical Model of the Dynamics of *Rickettsia rickettsii* in Tick-Host Interactions," Supervised: Mary Alderete, Carlos Castillo-Garsow, Carlos Lara, Gina Ramirez, Guarionex Jordan-Salivia, Monica Yichoy (MTBI Students), Summer 1996.

Mentoring Presentations

"Why You Should Consider Doctoral Education and the Professoriate: Personal Testimonies," MGE@MSA, Tempe, AZ, Feb 2012

Summer Undergraduate Research Institutes Organized & Directed

Co-Executive Director, *(MTBI)*, ASU, (Summers 2011–2013). Co-directed summer research program with Prof. Carlos Castillo-Chavez and Erika T. Camacho geared for undergraduate Latino and other minority students. Planned syllabus and homework assignments for daily lectures on topics such as nonlinear difference and differential equations, probability, stochastic processes and linear algebra; advised math instructors; lectured on nonlinear ode's; supervised teaching assistants; helped guide group research projects which culminated in poster and oral presentations as well as MCMSC Technical Reports.

Co-Director, *(AMSSI)*, Cal Poly Pomona and Loyola Marymount University, (2005–2007). Co-directed summer research program with Prof. Erika Camacho geared for undergraduate women and underrepresented minority students. Helped plan syllabus and homework assignments for nonlinear differential equations; co-organized and ran weekly staff meetings; invited guest speakers; co-organized tours of local industries; supervised research assistants; helped guide two group research projects which culminated in poster and oral presentations as well as Department of Mathematics & Statistics Technical Reports; tracked career progress of former AMSSI students.

Summer Director, *(MTBI)*, Cornell University, (Summers 1999–2003). Co-directed summer research program with Prof. Carlos Castillo-Chavez geared for undergraduate Latino and other minority students. Planned syllabus and homework assignments for daily lectures on topics such as nonlinear difference and differential equations, probability, stochastic processes and linear algebra; advised math instructors; organized and ran computer lab sessions; organized and ran weekly staff meetings; lectured on nonlinear ode's; supervised teaching assistants; helped guide group research projects which culminated in poster and oral presentations as well as Department of Biological Statistics and Computational Biology Technical Reports.

Fellowships:

1998–1999: Cornell University Graduate Anonymous Donor Award
1995: Cornell University EMPO Director's Award for Academic Excellence
Ford Foundation Fellow
Corning Foundation Graduate Fellow
NSF Graduate Engineering Education Fellow
Honor Society of Phi Kappa Phi Graduate Fellow

Service:
Steering Committee for International or National Conferences
SIAM Annual Conference, Chicago, IL, 2014.
AIMS' Fifth International Conference Dynamical Systems and Differential Equations, Cal Poly Pomona, 2004.
Blackwell/Tapia Conference Local Organizing Committee, Institute for Pure and Applied Mathematics (IPAM), Los Angeles, CA, 2004.
Ford Foundation Annual Conference, San Juan, Puerto Rico, 2003.

Organized and/or Chaired Sessions at National Conferences
SIAM Conference on Computational Science and Engineering
Workshop Celebrating Diversity, Salt Lake City, UT, 3/2015
MS88: Computational Advances in Energy Research
MS113: Fluid transport dynamics in biology and medicine
MS140: Modern computational modeling in fluids
MS166: Computational Science for Current Multidisciplinary Research Problems
MS192: The System Dynamics of Social and Health Processes using Quantitative Data Sciences Methods
MS216: Water Resources Management: How to add it all up
SIAM Conference on Computational Science and Engineering
Workshop Celebrating Diversity, Chicago, IL, 7/2014
MS32: Mathematical Modeling of Health Problems
MS48: Applications in Human Performance, Counterterrorism, and Risk Analysis
MS63: Dynamical Models in Applied Mathematics
MS79: Theoretical and Numerical Results in Dynamical Systems
MS95: Analysis and Applications of Optimization
MS109: Modeling and Algorithm Development for Mathematical Geosciences
Workshop Celebrating Diversity, San Diego, CA, 7/2013
MS34: Computational Science
MS47: Combinatorial Optimization
MS60: Mathematical and Theoretical Ecology
MS68: Mathematical Models of Public Health Problems
MS86: Computational Approaches to Mathematical Modeling and Analysis of Biological Systems
MS102: Numerical Models in Applied Problems
Workshop Celebrating Diversity, Minneapolis, MN, 7/2012

MS33: Cut Cell Methods for Solids and Incompressible Fluids
MS45: Computational Mathematics Applied to Scientific Problems
MS55: Dynamical Systems and Its Applications to Biological Models
MS70: Analysis and Applications of Optimization
MS83: New Developments in Mathematical Epidemiology
MS95: Operations Research

Applications of Discrete and Continuous Dynamical Systems (MS56),
Portland, OR, 7/2004

Applications of Nonlinear Oscillators (MS14), Montreal, Canada, 6/2003

Theoretical Biology and Nonlinear Dynamics (MS29), Montreal, Canada, 6/2003

Diversity Day, Montreal, Canada 6/2003

Theoretical Biology and Nonlinear Dynamics (MS30, MS46), Philadelphia, PA 7/2002

International Congress on Industrial and Applied Mathematics (ICIAM) Conference
The Diversity of Applied Mathematics (MS152), Vancouver, Canada, 7/2011

Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
Critical Transitions in Grad School: Advice for Current and Prospective Grad Students,
San Jose, CA, 10/2011
An Abstract Look at Algebra, Dallas, TX, 10/2009
New Generation of Math Ph.D.s, Dallas, TX in 10/2009; Kansas City, MO in
10/2007; Tampa, FL in 10/2006; and Denver, CO, 10/2005
Math REUnion Tampa, FL in 10/2006 and Denver, CO, 10/2005
Opportunities in Mathematics from a Funding Agency Perspective, Anaheim, CA, 10/2010

Society for Mathematical Biology Biennial Conference
Dynamic Mathematical Models in Biology (MS14), Rio de Janiero, Brazil, 7/2010

Ford Foundation Annual Conference
Natural Sciences Dissertation Workshop, Washington, DC, in 10/2006; San Juan,
PR in 10/2003
Mathematics, Physical Science & Engineering Academic Exchange Session,
Albuquerque, NM, 10/2002

Center for Nonlinear Studies at Los Alamos National Laboratory
Natural Sciences Dissertation Workshop, Los Alamos, NM, 12/2003

AIMS' Dynamical Systems and Differential Equations Conference
Bifurcation and Oscillation (CS06), Pomona, CA, 6/2004.

Other Service
• Reviewed Proposals for National Army Research Office
• Reviewed Proposals for Portugal's Foundation for Science and Technology (FCT)
• Reviewed grant proposals for National Science Foundation, Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (TUES), Research Experience for Undergraduates (REU)

• Reviewed book manuscripts for Chapman & Hall/CRC Press, Wiley, and Brooks/Cole Publishing Co.

• Refereed manuscripts for *Journal of Theoretical Biology*, *Journal of Vibration & Control*, *Discrete and Continuous Dynamical Systems-Series B*, *Communications in Nonlinear Science and Numerical Simulation*, *Mathematical Biosciences*, *Mathematical Biosciences and Engineering*, *Australian and New Zealand Journal of Psychiatry*, *The Mathematical Scientist*, and *Nonlinear Dynamics*

• External Reviewer for Tenure and Promotion Files

• SACNAS Math Task Force, 2008-present.

• Latinos in the Mathematical Sciences Conference (Lat@Math) REU Panelist, 4/2015.

University Service

Arizona State University:

SMNS MS Degree Development (Chair, 2015-2016); SMNS Scheduling ACO/MAT/STA courses (2015-2016); SMNS Faculty Evaluations (2015-2016); SMNS Hiring Committee for Applied Mathematics Instructor (Chair, 2015); SMNS Hiring Committee for SMNS Director* (Member, 2014-2015); SMNS Hiring Committee for Applied Mathematics (Chair, 2012-2013); NCIAS Program Review Committee (2009-2011); SMNS Personnel Review Committee* (Chair 2010-2013; Member, 2008-2010); NCIAS Promotion & Tenure Committee* (Chair, 2010-2011; Member, 2008-2010); Teacher's College Liaison Committee (2010); Teacher's College Academic Specialization Task Force (2010); Applied Math Degree Implementation Committee (Chair, 2007-2010); Created two new math courses for Applied Math B.S. degree (MAT 350, MAT 450); NCIAS Veteran's Committee; SMNS Peer Review Committee - Three Year Pre-tenure Review (Member, 2015; Member, 2014; Member, 2013; Member, 2012; Chair, 2011; Chair, 2010; Chair, 2008; Chair, 2007); SMNS Peer Review Committee - Tenure Review Committees (Member, 2015; Chair, 2011; Chair, 2010; Member, 2008); SMNS Peer Review Committee - Lecturer Review (Member, 2012); SMNS Hiring Committee for Applied Computing (2007-2008, 2009-2010); MSAC Math Lecturer Hiring Committee (Chair, 2007-2008).

Outreach: SMNS *Pizza, Professors, and Profession* Panelist (2016); NCIAS recruitment table: Road to the University (2015); NCIAS Homecoming table (2015);

Cal Poly Pomona:

University Curriculum Committee (2001-2003); College Commencement Committee (2002-2003); Reader for Graduate Writing Test (6 times during 2001-2004). Department Scholarship Committee (2000-2001); Department Instructional Assessment Committee (2000-2001, Chair 2001-2002); Department Recruitment and Outreach Committee (2001-2005); Department RTP Document Review Committee (2001-2007, Chair 2003-2004); Academic Excellence Workshop Faculty Advisor (2000-2007); Science Educational Enhancement Services (SEES) Faculty Advisor (2003-2007); Department Budget Committee (2002-2003, 2004-2005); Department Colloquium Committee (2002-2003; Chair in Fall 2002, Winter 2003); Department Computer Committee (2003-2007; Chair 2004-2007); Department Curriculum Committee (2003-2004); Department Lecturer Evaluation Committee* (2005-2006); Department Nominating Committee (2005-2006); Department RTP Committee* (2006-2007); De-

partment Textbook Committee (2006-2007).

Cornell University, Center for Applied Mathematics Service:
Degree Requirements Committee Member (1998-1999); Bill Sears Seminar Committee Member (1995-1996).

∗ =Elected Committee

Courses Taught
∗ =Course I created; ∗∗ =Course I co-created

Massachusetts Institute of Technology (14-week semesters):
18.03 - Differential Equations
18.384 - Undergraduate Seminar in Physical Mathematics

Arizona State University (15-week semesters):
MAT 210 - Brief Calculus
MAT 270 - Calculus with Analytic Geometry I
MAT 275 - Modern Differential Equations
MAT 300 - Mathematical Structures
MAT 310 - Introduction to Geometry
MAT 350* - Techniques and Applications of Applied Mathematics
MAT 371 - Advanced Calculus I
MAT 421 - Applied Computational Methods
MAT 450* - Mathematical Models in Biology
MAT 499** - Independent Study (Capstone Course)
STP 421 - Probability

Cal Poly Pomona (10-week quarters):
MAT 114 - Analytic Geometry and Calculus I
MAT 115 - Analytic Geometry and Calculus II
MAT 116 - Analytic Geometry and Calculus III
MAT 201 - Introduction to Numerical Methods
MAT 208 - Introduction to Linear Algebra
MAT 214 - Calculus of Several Variables I
MAT 216 - Differential Equations
MAT 224** - Elementary Linear Algebra and Differential Equations
MAT 380 - Mathematics of Operations Research I
MAT 381 - Mathematics of Operations Research II
MAT 401 - Numerical Analysis
MAT 402 - Numerical Methods in Differential Equations
MAT 431 - Differential Equations I
MAT 432 - Differential Equations II
MAT 508 - Numerical Linear Algebra

MAT 509 - Error Analysis
MAT 545 - Mathematically Modeling I
MAT 546 - Mathematically Modeling II
STA 315 - Probability and Statistics for Engineers

Cornell University (15-week semesters):
MATH 1110 - Calculus I
MATH 1120 - Calculus II

Memberships:

2009 – present: Society for Mathematical Biology
1997 – present: Society for Industrial and Applied Mathematics
1995 – present: Society for the Advancement of Chicanos and Native Americans in Science
1991 – present: Golden Key National Honor Society
1992 – present: Honor Society of Phi Kappa Phi

References:

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