Stephen A. Wirkus
Curriculum Vitae
May 18, 2021

WORK

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

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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

2018–2019	Interim Director, School of Mathematical & Natural Sciences (SMNS), Arizona State University (ASU)
2017–present	Professor, SMNS, ASU
2017–2018	Associate Director, SMNS, ASU
2015–2017	Interim Associate Director, SMNS, ASU
2013–present	Sun Devil Family Association Professor, 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
2007–2017	Associate Professor (tenured), SMNS, ASU
2007–2010	Adjunct Associate Professor, Department of Mathematics and Statistics, California State Polytechnic University, Pomona (Cal Poly Pomona)
2005–2007	Associate Professor (tenured), 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

PUBLICATIONS

Notation: *=undergraduate student at time of work, **=graduate student at time of work

PEER-REVIEWED RESEARCH PUBLICATIONS (JOURNAL)

32. K. Wifvat**, E.T. Camacho, **S. Wirkus**, T. Léveillard, 2021, "The Role of RdCVFL in a Mathematical Model of Photoreceptor Interactions", *Journal of Theoretical Biology*, 520, 110642. [16 pages]

31. W.K. Caldwell**, A. Hunter, C.S. Plesko, **S. Wirkus**." Understanding Asteroid 16 Psyche's composition through 3D impact crater modeling," *Icarus*, 351, 113962, 2020.

30. W.K. Caldwell*, B. Freedman*, L. Settles*, M.M. Thomas*, E.T. Camacho, **S. Wirkus**, "The Vicodin abuse problem: A mathematical approach," *Journal of Theoretical Biology*, 483, 110003, 2019.

29. E.T. Camacho, S. Lenhart, L.A. Melara, M.C. Villalobos, **S. Wirkus**, "Optimal control with MANF treatment of photoreceptor degeneration," *Mathematical medicine and biology: a journal of the IMA*, 2019.

28. E. Soho**, **S. Wirkus**, "Within Host Dynamical Immune Response to Co-Infection with Malaria and Tuberculosis," in *Advanced Mathematical Methods in Biosciences and Applications*, Springer, Cham, 241-261, 2019.

27. E.T. Camacho, A. Radulescu, **S. Wirkus**, P.A. Marshall "A Qualitative Analysis of Ubiquitous Regulatory Motifs in *Saccharomyces cerevisiae* Genetic Networks," *Communications in Nonlinear Science and Numerical Simulation*, 69: 148-167, 2019.

26. W.K. Caldwell**, A. Hunter, C.S. Plesko, **S. Wirkus**, "Verification and Validation of the FLAG Hydrocode for Impact Cratering Simulations," *ASME. J. Verif. Valid. Uncert.* 3(3), 2018.

25. E. Soho**, **S. Wirkus**, "Connecting immunology and epidemiology," *The Mathematical Scientist*, 43(2): 1-8, 2018.

24. M. Cruz-Aponte**, **S. Wirkus**, "Kolmogorov Equations Applied to a SIS coupled Epidemiological Model," *The Mathematical Scientist*, 41(2): 108-118, 2016.

23. E.T. Camacho, C. Punzo, **S. Wirkus**, "Quantifying the Metabolic Contribution to Photoreceptor Death in Retinitis Pigmentosa via a Mathematical Model," *Journal of Theoretical Biology*, 408: 75-87, 2016.

22. E.T. Camacho, T. Léveillard, J.-A. Sahel, **S. Wirkus**, "Mathematical Model of the Role of RdCVF in the Coexistence of Rods and Cones in a Healthy Eye," *Bulletin of Mathematical Biology*, 78(7): 1394-1409, 2016.

21. E.T. Camacho, A. Radulescu, **S. Wirkus**, "Bifurcation Analysis of a Photoreceptor Interaction Model for Retinitis Pigmentosa," *Communications in Nonlinear Science and Numerical Simulation*, 38: 267-276, 2016.

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

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

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

16. E.T Camacho, **S. Wirkus**, P.A. 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.T. Camacho, M.A. Colon-Velez*, D.J. 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, C. Castillo-Chavez, **S. Wirkus**, "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.T. 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.T. Abiva*, E.T. Camacho, E.S. Joseph*, A.K. Mikaelian*, C.R. Rogers*, J. Shelton**, **S.A. 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.T. Camacho, R.M. Holmes, **S.A. 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.T. 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.A. Wirkus**, R.J. Swift, R. Szypowski, *A Course in Differential Equations with Boundary-Value Problems, 2nd Edition*, Chapman & Hall/CRC Press/Taylor & Francis Group, Boca Raton, FL, 767 pages, 7×10in, 2017. ISBN-13: 978-1498736053; ISBN-10: 149873605X

- **S.A. Wirkus**, R.J. Swift, *A Course in Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC Press/Taylor & Francis Group, Boca Raton, FL, 807 pages, 6.3×9.3in, 2015. ISBN-13: 978-1466509085; ISBN-10: 1466509082

- R.J. Swift, **S.A. Wirkus**, *A Course in Ordinary Differential Equations,* Chapman & Hall/CRC Press/Taylor & Francis Group, Boca Raton, FL, 667 pages, 6.5×9.3in, 2006. ISBN-13: 978-1584884767; ISBN-10: 1584884762
  ∘Review from zbMATH: `https://zbmath.org/?q=an:1125.34001`
  ∘Review from the Mathematical Association of America (MAA): `http://www.maa.org/press/maa-reviews/a-course-in-ordinary-differential-equations`
  ∘Review from the European Mathematical Society (EMS):`http://www.public.asu.edu/~swirkus/EMS_2007_review_p65_65.pdf`

SOLUTION MANUALS

- **S.A. Wirkus**, R.J. Swift, Solution Manual for *A Course in Ordinary Differential Equations, 2nd Edition*, 299 pages, Chapman & Hall/CRC Press, 2015.
- R.J. Swift, **S.A. Wirkus**, Solution Manual for *A Course in Ordinary Differential Equations*, 245 pages, Chapman & Hall/CRC Press, 2007.

PEER-REVIEWED RESEARCH 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 PUBLICATIONS

- E.T. 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.

TECHNICAL REPORTS

11. 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/2013-2`, 2013; also Cornell University Library arXiv, `http://arxiv.org/pdf/1308.3673.pdf`.

10. 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/2012-5`, 2012.

9. 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/2011-2`, 2011.

8. 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.

7. 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.

6. 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.

5. 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.

4. 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/2002-2`, 2002.

3. 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/2001-3`, 2001.

2. 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/2001-10`, 2001.

1. 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/2000-4`, 2000.

RESEARCH PRESENTATIONS

INTERNATIONAL PRESENTATIONS

- "Optimal control in a pharmacokinetics/pharmacodynamics model of doripenum,"
  Jul 2018 Society for Mathematical Biology (SMB) Conference, Minisymposium, Minisymposium, Sydney, Australia.

- "A Mathematical Model of Photoreceptor Death: Retinitis Pigmentosa and Retinal Detachment,"
  Aug 2015 International Congress on Industrial & Applied Mathematics (ICIAM), Minisymposium, Beijing, China

- "Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neural Network Model,"
  Jul 2014 Society for Mathematical Biology (SMB) Conference, Minisymposium, Osaka, Japan

- "Inferring Photoreceptor Death and Rescue in Retinitis Pigmentosa from Mathematical Models and In Silico Experiments,"
  May 2014 Institut de la Vision, Paris, France.

- "Mathematical Modeling of Fungal Infection in Immune Compromised Individuals: Implications for Treatment with Fungicidal Drugs,"
  Jul 2010 SMB Conference, Minisymposium, Rio de Janiero, Brazil.

- "Evolution of Fluconazole Resistance in *Candida albicans*,"
  Jul 2003 First Joint Meeting of SIAM and The Canadian Applied and Industrial Mathematics Society (CAIMS), Minisymposium, Montreal, Canada.

NATIONAL PRESENTATIONS (NATIONAL AUDIENCE)

- "Mathematical Modeling of Fungal Infection in Immune Compromised Individuals: The Effect of Back Mutation on Drug Treatment,"
  Jul 2016 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting, Minisymposium, Boston, MA,

- "Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neural Network Model,"
  Jul 2014 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting, Minisymposium, Chicago, IL,

- "A Model of Photoreceptor Degeneration in Zebrafish Via a Cone Mutation,"
  Aug 2014 MathFest Minisymposium, Portland, OR,
  Jul 2013 SIAM Annual Meeting, Minisymposium, San Diego, CA.

- "Modeling Molecular Systems with Differential Equations,"
  Nov 2007 Natural Science Week Conf, Univ. of Puerto Rico, Rio Piedras, PR.

- "Numerical Solutions of Delay Differential Equations,"
  Jul 2003 Mathematical Epidemiology Tutorial, LANL, Los Alamos, NM.

- "Who Says We R_0 Ready for Change,"
  Jul 2002 SIAM Annual Meeting, Minisymposium, Philadelphia, PA.
- "Approximations of a Time Delay,"
  Jan 2002 AMS/MAA Annual Meeting, Minisymposium, San Diego, CA.
- "Complete Bifurcation Set of Two Coupled van der Pol Oscillators with Delay Coupling,"
  May 2000 David Blackwell / Richard Tapia Lecture Series, Ithaca, NY
- "Bifurcations in the Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling,"
  May 1999 SIAM Annual Meeting, Minisymposium, Atlanta, GA.
- "The Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling,"
  Oct 1998 Ford Foundation Annual Conf., Academic Exchange Session, Irvine, CA
- "The Mathematics of Pumping a Swing,"
  Oct 1996 Ford Foundation Annual Conf., Academic Exchange Session, Irvine, CA

NATIONAL PRESENTATIONS (REGIONAL AUDIENCE)

- "Population Models in Biology,"
  Oct 2014 Institute of Interdisciplinary Research, Colloquium, Cayey, Puerto Rico
- "Qualitative Inverse Problems using Bifurcation Analysis in the Recurrent Neural Network Model,"
  Feb 2014 MLK Scholar Brown Bag Talk, MIT, Cambridge, MA.
- "Dynamics of a bilocal (two-patch) population community,"
  Jun 2009 Summer Math Institute Colloquium, Cornell University, Ithaca, NY.
- "Numerical Solutions of Delay Differential Equations,"
  Jul 2004 Summer Colloquium, Hope College, Holland, MI
- "Evolution of Fluconazole Resistance in *Candida albicans*,"
  Dec 2003 Math Dept. Colloquium, Univ of New Mexico, Albuquerque, NM
- "Complete Bifurcation Set of Two Coupled van der Pol Oscillators with Delay Coupling,"
  Mar 2000 Center for BioDynamics Colloquium, Boston University, Boston, MA
- "Bifurcations in the Dynamics of Two Coupled van der Pol Oscillators with Delay Coupling,"
  Apr 1999 Dept. of Applied Mathematics Colloq., University of Colorado at Boulder

REGIONAL/LOCAL PRESENTATIONS

- "Mathematical Modeling Prescription Drug Use (and Abuse),"
  Jan 2019 Dept. of Mathematics Seminar, Howard University, Washington, DC.

- "Mathematical Models of Photoreceptor Interactions,"
  Oct 2014 Applied and Computational Math Seminar, ASU, Glendale, AZ.

- "Numerical Solutions of Delay Differential Equations,"
  Jun 2011 MCMSC Mini-Workshop, ASU, Tempe, AZ.

- "Mathematical Modeling of Fungal Infection in Immune Compromised Individuals: Implications for Treatment with Fungicidal Drugs,"
  Apr 2011 Los Arizona Days, University of Arizona, Tucson, AZ.

- "Some Applications of Mathematics,"
  Feb 2008 MGE@MSA, ASU.

- "Gene Regulatory Network: A Continuous Nonlinear Model"
  Sep 2007 Department of Math BioMath Seminar, ASU, Tempe, AZ.

- "An Epidemiological Model of Collaborative Learning,"
  Mar 2007 Loyola Marymount University Math Colloquium, Los Angeles, CA.

- "The Mathematics of Pumping a Swing,"
  May 2002 Cal Poly Pomona Math Colloquium, Pomona, CA.

- "Complete Bifurcation Set of Two Coupled van der Pol Oscillators with Delay Coupling,"
  Mar 2001 Loyola Marymount University Math Colloquium, Los Angeles, CA.
  Oct 1998 Center for Applied Math Student Talks, Ithaca, NY.

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

- "Similarity Dimension and Fractals,"
  Apr 1995 Northeast Chapter SACNAS Conference, Ithaca, NY.

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.

GRANTS(EXTERNAL)

AS PRINCIPAL INVESTIGATOR (PI)

(Total: $1,269,168; **Total (Estimated) Investment Recognition: $627,358.20**)

- *Enhancement of the Mathematics Component of the 2009-2010 SACNAS Conferences*, National Science Foundation $238,740, **(Estimated Invest Recog: $95,496=40%)**, DMS-0935993, 6/2009-5/2011, co-PIs E.Camacho, A.Gallegos, Beth Roszman. Grant submitted through SACNAS per their requirements.

- *Enhancement of the Mathematics Component of the 2009-2010 SACNAS Conferences,* National Security Agency, $194,937, **(Estimated Invest Recog: $77,974.80=40%)**, 7/2009-11/2010, co-PIs E.Camacho, A.Gallegos, Beth Roszman. Grant submitted through SACNAS per their requirements.

- *Enhancement of the Mathematics Component of the 2008 SACNAS Conference,* National Security Agency, $249,072, **(Estimated Invest Recog: $124,536=50%)**, H98230-08-1-0114, 7/2008-11/2008, co-PI E.Camacho, Beth Roszman. Grant submitted through SACNAS per their requirements.

- *REU Site: Applied Mathematical Sciences Summer Institute (AMSSI),* National Science Foundation, $511,419, **(Estimated Invest Recog: $306,851.40=60%)**, DMS-0453602, 4/2005-3/2008, co-PI R.J.Swift. Grant submitted through Cal Poly Pomona.

- *Applied Mathematical Sciences Summer Institute (AMSSI),* National Security Agency, $75,000, **(Estimated Invest Recog: $22,500=30%)**, MSPF-04IC-227, 3/2005-2/2006, co-PIs E.Camacho, E.Mosteig, R.J.Swift. Grant submitted through Cal Poly Pomona.

AS CO-PI

(Total: $2,782,200; **Total (Est) Invest Recog: $821,491.60**)

- *ASU-Sloan Program for Exceptional Mentoring (PEM)*, ASU Foundation (ASUF 30006275), $697,079, **(ASU Invest Recog: $104,561.90=15%)**, 7/2014-6/2017; PI C.Castillo-Chavez, co-PI E.Camacho, S.Wirkus.

- *International Research Experience for Students (IRES) Project Proposal: Population Dynamics and Complex Systems: Challenges and Opportunities,* National Science Foundation, $179,936, **(ASU Invest Recog: $35,987.20=20%)**, DMS-1261211, 3/2013-2/2016; 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, $527,700, **(ASU Invest Recog: $105,540.00=20%)**, P200A120192, 1/2013-12/2015; PI C.Castillo-Chavez, co-PIs E.Camacho, S.Suslov, S.Wirkus.

- *REU Site: Mathematical and Theoretical Biology Institute (MTBI),* National Science Foundation, $810,785, **(ASU Invest Recog: $405,392.50=50%)**, 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, $197,047, **(ASU Invest Recog: $59,114.10=30%)**, MSPF-RE-13-MTBI-0513-asu-2-2-121012, 5/2013-4/2015; PI C.Castillo-Chavez, co-PIs E.Camacho, S.Wirkus.

- *Applied Mathematical Sciences Summer Institute (AMSSI),* National Security Agency, $254,653, **(Estimated Invest Recog: $76,395.90=30%)**, MSPF 07IC-043, 3/2007-2/2009, PI E.Camacho, co-PIs E.Mosteig, R.J.Swift, S.Wirkus. Grant submitted through Loyola Marymount University.

- *Applied Mathematical Sciences Summer Institute (AMSSI),* National Security Agency, $115,000, **(Estimated Invest Recog: $34,500=30%)**, MSPF 06IC-022, 3/2006-2/2007, PI E.Camacho, co-PIs E.Mosteig, R.J.Swift, S.Wirkus. Grant submitted through Loyola Marymount University.

SUBMITTED GRANTS

- *NSF INCLUDES Alliance: Developing Resources, Equity, Aptitudes and Mentoring for Math through Virtual and Experiential Learning and a Network of Bridge to Doctorate Programs*, National Science Foundation, PI S.Wirkus, co-PI R.Renaut, M.Español, $1,651,784, collaboration with University of Texas - Arlington (Lead), submitted Jan 2021.

- *R15: Modeling the role of RdCVFL in Cone Photoreceptors*, National Institutes of Health, National Eye Institute, PI S.Wirkus, $430,937, submitted Jun 2020.

ACADEMIC AWARDS /HONORS /FELLOWSHIPS

- Grand Marshal, New College of Interdisciplinary Arts & Sciences Convocation, Spring 2015.

  "College Marshals consist of selected faculty members from each college at all ASU campuses. Selection criteria is left to the individual colleges, but faculty who have recently won awards or have received special recognition are given primary consideration."

- ASU Professor of the Year, Sun Devil Family Association, 2013.
  `https://asunow.asu.edu/content/professor-mathematics-named-2013-asu-professor-year`.

  One tenured faculty member is recognized each year who displayed outstanding commitment to their students, based on a package submitted that included recommendations from Deans, faculty, and students. First faculty member selected in math; first faculty member selected from West campus.

- 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), 2011.

  Awarded nationally to one faculty mentor of an AGEP student each year.

- Mentoring Recognition Award, Mathematical and Theoretical Biology Institute, 2002, 2003, 2009, 2011.

  Awarded by MTBI founder in recognition of dedication to program.

- Leader in Undergraduate Research Citation, National Security Agency, 2006.

  Awarded at the Promoting Undergraduate Research in Mathematics (PURM) Conference for outstanding leadership in undergraduate research.

- Mentoring Recognition Award, Blackwell/Tapia Distinguished Lecture Series, 2000.

Awarded for outstanding mentoring in undergraduate research.

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

MENTORING ACTIVITIES

PH.D. STUDENTS COMMITTEE CHAIR (or CO-CHAIR)

- Sandra Cole, Applied Mathematics, School of Mathematical & Statistical Sciences, "A Mathematical Model of Opioid Abuse", ASU, Ph.D. expected: 5/2022.
- Kathryn Wifvat, Applied Mathematics, School of Mathematical & Statistical Sciences, "Math Models of Photoreceptors and Redox Signaling" (co-Chair with E.Camacho), ASU, Ph.D. expected: 8/2021.
- Danielle Brager, Applied Mathematics, School of Mathematical & Statistical Sciences, "Modeling and Analyzing the Progression of Retinitis Pigmentosa" (co-Chair with E.Camacho), ASU, Ph.D. awarded: 8/2020.
- Wendy Caldwell, Applied Mathematics, School of Mathematical & Statistical Sciences, ASU, "Differential Equation Models for Understanding Phenomena beyond Experimental Capabilities", Ph.D. awarded: 5/2019.
- Maytee Cruz-Aponte, Applied Math for the Life and Social Sciences, School of Human Evolution & Social Change, ASU, "Epidemic Dynamics of Metapopulation Models," Ph.D. awarded: 5/2014.
- Edme Soho, Applied Math for the Life and Social Sciences, School of Human Evolution & Social Change, ASU, "Immune Response in the Study of Infectious Diseases (Co-Infection) in an Endemic Region," Ph.D. awarded: 12/2011.

PH.D. STUDENTS COMMITTEE MEMBER

- Alicia Urdapilleta, Applied Mathematics for the Life and Social Sciences, School of Human Evolution & Social Change, 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 STUDENTS 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 STUDENTS 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.

BARRETT UNDERGRADUATE HONORS THESIS CHAIR

- Cassidy Herzig, School of Mathematical & Statistical Sciences, "Analysis of a Mathematical Model of Adderall Abuse", 2020-2021.

- Taylor Mooney, School of Mathematical & Statistical Sciences, "A Mathematical Model of Adderall Abuse", 2019.

BARRETT UNDERGRADUATE HONORS THESIS COMMITTEE MEMBER

- Miriam Goldman, School of Mathematical & Natural Sciences, 'Mathematical Analysis of Retina Detachment", 2016-2017.
- Bryan Sawkins, School of Mathematical & Natural Sciences, "Optimal Control PK/PD Model for Doripenem in a *P. aeruginosa* Strain", 2017-2018.

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 Prof. 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.

UNDERGRADUATE PROJECTS SUPERVISED (OR CO-SUPERVISED)

35. "Relaxation Oscillations in Retina Models", Barinda Banerjee (ASU student), Spring 2020.
34. "A Mathematical Model of Adderall Abuse", Taylor Mooney (ASU student), 2019.

33. "Sensitivity Analysis for a PK/PD Model of Doripenem in a *P. aeruginosa* Strain", Bryan Sawkins (ASU Student), Spring 2018.

32. "Photoreceptor Mathematical Models in the Zebrafish," Josh Grosso (Gary K. Herberger Young Scholars Academy Alumni), 2017-2018.

31. "Mathematics in Signal Processing", Wandile Nhlabatsi (ASU student) 2017-2018.

30. "Photoreceptor Death Kinetics in the Zebrafish," Javier Urcuyo (ASU student), Josh Grosso (Gary K. Herberger Young Scholars Academy Alumni), Fall 2016.

29. "Modeling Density Dependence on Retinitis Pigmentosa," Miriam Goldman, Ojeen Korkes (ASU students), Fall 2016.

28. "Sensitivity Analysis for a Pharmacokinetics/Pharmacodynamics (PK/PD) Model of Doripenem in a *P. aeruginosa* Strain," Supervised Daniel El Wailly, Jordan Dubois, Kathryn Stefanko (ASU students), Karaline Petty (Gary K. Herberger Young Scholars Academy), Fall 2016.

27. "Optimal Control of the Concentration of Doripenem to Kill *P. aeruginosa* Strains in a PK/PD Model," Supervised Christopher Graham (ASU student), Fall 2016.

26. "Optimal Control of the Concentration of Doripenem to Kill *P. aeruginosa* Strains in a PK/PD Model," Supervised Daniel El Wailly, Christopher Graham, Stephen Lacour (ASU students), Spring 2016.

25. "Effectiveness of Different Doripenem Dosages on *P. aeruginosa* Strains in a Pharmacokinetics/Pharmacodynamics (PK/PD) Model," Supervised Jonathon Burkow, Kathryn Stefanko (ASU students), Spring 2016.

24. "Pharmacokinetics/Pharmacodynamics (PK/PD) Model in MATLAB's SimBiology," Supervised Tim Bosley (ASU student), Spring 2016.

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

22. "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.

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

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

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

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

17. "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.

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

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

14. "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.

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

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

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

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

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

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

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

6. "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.

5. "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.

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

3. "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.

2. "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.

1. "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.

- Additionally supervised numerous 'Footnote 18' contracts in which Barrett Honors College students undertake an extra project (beyond that required in the course) in order to receive honors credit for the course.

RECOGNITION OF SUPERVISED UNDERGRADUATE RESEARCH

- "Optimal Control of the Concentration of Doripenem to Kill *P. aeruginosa* Strains in a Pharmacokinetics/Pharmacodynamics (PK/PD) Model," Daniel El Wailey, Christopher Graham, Stephen Lacour (ASU students)
    - *Best Poster Award*, New College Undergraduate Research and Creative Projects Symposium, Glendale, AZ, April 2016.

- "Substance Abuse via Legally Prescribed Drugs: The Case of Vicodin in the United States," Wendy Caldwell, Benjamin Freedman, Luke Settles, Michael Thomas (MTBI students)
    - *SACNAS Poster Session Award*, Graduate and Undergraduate Poster Session, San Antonio, TX, October 2013.
    - Featured in *MIT Technology Review*, August 29, 2013.
      `http://www.technologyreview.com/view/518566/how-to-tackle-the-vicodin-abuse-problem/`

- "Alcohol's Effect on Neuron Firing," Charles Rogers, Jeannine Abiva, Edna Joseph, Arpy Mikaelian (AMSSI students)
    - *SIAM Poster Session Award*, SIAM Southeast Atlantic Section Annual Meeting, Auburn, AL, April 2006.
    - *MAA Poster Session Award*, MAA Undergraduate Poster Session, San Antonio, TX, January 2006.

- "A Continuous Model of Gene Expression," Elizabeth Miller, Jason Pham, Lissette LaPlace, Joseph Hunt (AMSSI students)
    - *MAA Poster Session Award*, MAA Undergraduate Poster Session, San Antonio, TX, January 2006.

- "A Model of Beta-cell Mass, Insulin, Glucose, and Receptor Dynamics with Applications to Diabetes," Ryan Hernandez, Danielle Lyles, Daniel Rubin, Thomas Voden (MTBI Students)
    - *MAA Poster Session Award*, MAA Undergraduate Poster Session, San Diego, CA, January 2002.

MENTORING PRESENTATIONS

- *Why You Should Consider Doctoral Education and the Professoriate: Personal Testimonies*, MGE@MSA, Tempe, AZ, March 2019.
- *How STEM Professors are Committed to Social Justice*, SUCCESS 2017–Maryland Pipeline Professional Development Conference, Hanover, MD, August 2017.
- *Why You Should Consider Doctoral Education and the Professoriate: Personal Testimonies*, MGE@MSA, Tempe, AZ, March 2017
- *Scholarship, Research, and Creative Activities*, Preparing Future Faculty Session, Tempe, AZ, September 2016.
- *Excellence in Teaching*, Preparing Future Faculty Session, Tempe, AZ, Oct 2015.
- *Why You Should Consider Doctoral Education and the Professoriate: Personal Testimonies*, MGE@MSA, Tempe, AZ, February 2012

SERVICE

STEERING COMMITTEES FOR INTERNATIONAL OR NATIONAL CONFERENCES

- SIAM Annual Meeting (AN14), Chicago, IL, 2014.
- AIMS' Fifth International Conference on 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 CHAIRED RESEARCH SESSIONS AT INTERNATIONAL CONFERENCES

- International Congress on Industrial and Applied Mathematics (ICIAM) Quadrennial Meeting, Beijing, China, 8/2015
    - *MS-Fr-E-49: Mathematical Models of Retinal Degeneration and Treatments*
- Society for Mathematical Biology (SMB) Conference, Osaka, Japan, 7/2014
    - *MS14: Dynamical Models in Mathematical Biology*
- ICIAM Quadrennial Meeting, Vancouver, Canada, 7/2011
    - *MS152: The Diversity of Applied Mathematics*

- SMB Conference, Rio de Janiero, Brazil, 7/2010
  - *MS14: Dynamic Mathematical Models in Biology*

- AIMS' Dynamical Systems and Differential Equations Conference, Pomona, CA, 6/2004
  - *CS06: Bifurcation and Oscillation* (Chaired session only.)

- First Joint Meeting of SIAM and The Canadian Applied and Industrial Mathematics Society (CAIMS), 6/2003
  - *MS14: Applications of Nonlinear Oscillators*
  - *MS29: Theoretical Biology and Nonlinear Dynamics* Montreal

ORGANIZED AND CHAIRED RESEARCH SESSIONS AT NATIONAL CONFERENCES

- SIAM Annual Meeting, Boston, MA, 7/2016
  Workshop Celebrating Diversity
  - *MS64: Some Biological and Physical Models in Applied Mathematics*

- SIAM Annual Meeting, Chicago, IL, 7/2014
  Workshop Celebrating Diversity
  - *MS63: Dynamical Models in Applied Mathematics*

- SIAM Annual Meeting, San Diego, CA, 7/2013
  Workshop Celebrating Diversity
  - *MS102: Numerical Models in Applied Problems*

- SIAM Annual Meeting, Minneapolis, MN, 7/2012
  Workshop Celebrating Diversity
  - *MS55: Dynamical Systems and Its Applications to Biological Models*

- Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Annual Conference, Dallas, TX, 10/2009
  - *An Abstract Look at Algebra*
  - *New Generation of Math Ph.D.s*

- SACNAS Annual Conference, Kansas City, MO, 10/2007
  - *New Generation of Math Ph.D.s*

- SACNAS Annual Conference, Tampa, FL, 10/2006
  - *New Generation of Math Ph.D.s*

- SACNAS Annual Conference, Denver, CO, 10/2005
  - *New Generation of Math Ph.D.s*

- SIAM Annual Meeting, Portland, OR, 7/2004
  - *MS56: Applications of Discrete and Continuous Dynamical Systems*

- Ford Foundation Annual Conference, Albuquerque, NM, 10/2002
  - *Mathematics, Physical Science & Engineering Academic Exchange Session*

- SIAM Annual Meeting, Philadelphia, PA 7/2002
  - *MS30: Theoretical Biology and Nonlinear Dynamics, Part I*
  - *MS46: Theoretical Biology and Nonlinear Dynamics, Part II*

ORGANIZED RESEARCH SESSIONS AT NATIONAL CONFERENCES

- SIAM Conference on Computational Science and Engineering, Salt Lake City, UT, 3/2015
  Workshop Celebrating Diversity
  - *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 Annual Meeting, Chicago, IL, 7/2014
  Workshop Celebrating Diversity
  - *MS32: Mathematical Modeling of Health Problems*
  - *MS48: Applications in Human Performance, Counterterrorism, and Risk Analysis*
  - *MS79: Theoretical and Numerical Results in Dynamical Systems*
  - *MS95: Analysis and Applications of Optimization*
  - *MS109: Modeling and Algorithm Development for Mathematical Geosciences*

- SIAM Annual Meeting, San Diego, CA, 7/2013
  Workshop Celebrating Diversity
  - *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*

- SIAM Annual Meeting, Minneapolis, MN, 7/2012
  Workshop Celebrating Diversity
  - *MS33: Cut Cell Methods for Solids and Incompressible Fluids*
  - *MS45: Computational Mathematics Applied to Scientific Problems*
  - *MS70: Analysis and Applications of Optimization*
  - *MS83: New Developments in Mathematical Epidemiology*
  - *MS95: Operations Research*

ORGANIZED AND CHAIRED PROFESSIONAL DEVELOPMENT SESSIONS

- SACNAS Annual Conference, San Jose, CA, 10/2011
  - *Critical Transitions in Grad School: Advice for Current and Prospective Grad Students*

- SACNAS Annual Conference, Anaheim, CA, 10/2010
  - *Opportunities in Mathematics from a Funding Agency Perspective*
- SACNAS Annual Conference, Tampa, FL, 10/2006
  - *Math REUnion*
- Ford Foundation Annual Conference, Washington, DC, 10/2006
  - *Natural Sciences Dissertation Workshop*
- SACNAS Annual Conference, Denver, CO, 10/2005
  - *Math REUnion*
- Center for Nonlinear Studies at Los Alamos National Laboratory, Los Alamos, NM, 12/2003
  - *Natural Sciences Dissertation Workshop*
- Ford Foundation Annual Conference, San Juan, PR, 10/2003
  - *Natural Sciences Dissertation Workshop*
- First Joint Meeting of SIAM and CAIMS, 6/2003
  - *Diversity Day*

EDITORIAL BOARDS

- Associate Editor, *The Mathematical Scientist*, 2016-2018, `http://www.appliedprobability.org/content.aspx?Group=tms&Page=tms`

OTHER PROFESSIONAL SERVICE

- Reviewed grant proposals for
  - *Ford Foundation Diversity Fellowships*
  - *National Army Research Office*
  - *NSF Directorate for Education and Human Resources (EHR), Division of Undergraduate Education (DUE)*
  - *NSF Directorate for Mathematical and Physical Sciences (MPS), Division of Mathematical Sciences (DMS)*
  - *Portugal's Foundation for Science and Technology (FCT)*
- Reviewed book proposals for
  - *Brooks/Cole Publishing Co.*
  - *Chapman & Hall/CRC Press*
  - *Wiley*
- Refereed manuscripts for
  - *Advances in Computational Mathematics*
  - *Australian and New Zealand Journal of Psychiatry*
  - *Bulletin of Mathematical Biology*
  - *Communications in Nonlinear Science and Numerical Simulation*

  - *Discrete and Continuous Dynamical Systems-Series B*
  - *Journal of Theoretical Biology*
  - *Journal of Vibration & Control*
  - *Mathematical Biosciences*
  - *Mathematical Biosciences and Engineering*
  - *Nonlinear Dynamics*
  - *The Mathematical Scientist*

- Workshop Celebrating Diversity Working Group, SIAM
  - Chair, 8/2012-7/2014
  - Member, 8/2011-7/2012, 8/2014-7/2015

- External Reviewer for Tenure and Promotion Files, multiple universities
- External Reviewer for Faculty Recognition Awards, multiple universities
- SACNAS Math Task Force, 2008-present
- Latinos in the Mathematical Sciences Conference (Lat@Math) REU Panelist, 4/2015
- Richard Tapia Conference Scholarship Review Committee

UNIVERSITY SERVICE (∗ =Elected Committee)

Arizona State University: (significant demonstration of leadership in bold)

University or College level

- NCIAS Convocation Committee (8/2018-present)
- NCIAS Retention Committee (1/2018-6/2019)
- Night of the Open Door
  - *SMNS Liaison, 2016*
  - *SMNS Participant, 2017, 2018*
- General Studies Council (8/2016-7/2019)
- Hiring Committee for SMNS Director* (Member, 2014-2015)
- New College of Interdisciplinary Arts & Sciences (NCIAS) Program Review Committee (2009-2011)
- Applied Mathematics in the Life and Social Sciences Ph.D. Admissions Review Committee
- NCIAS Promotion & Tenure Committee* (**Chair, 2010-2011**; Member, 2008-2010)
  Chaired and served on College-level tenure and promotion committee; evaluated promotions for Assistant Professors and Lecturers.
- Teacher's College Liaison Committee (2010)
- Teacher's College Academic Specialization Task Force (2010)
- NCIAS Veteran's Committee
- NCIAS recruitment table: Road to the University (2015)
- NCIAS Homecoming table (2015)

School or Department level

- SMNS Interim Director (**8/2018-6/2019**)
  - Made hiring recommendations to the Dean of NCIAS for tenure-track and Lecturer faculty positions.
  - Oversaw and implemented budget covering instructional faculty, staff, initiatives, equipment upkeep, travel, etc. in SMNS.
  - Coordinated plans and progress with all SMNS Program Leads.
  - Participated in University leadership meetings for Directors & higher admins.
  - Represented SMNS/served as liaison for numerous on- and off-campus events and NCIAS/ASU initiatives.
  - Planned and ran bi-monthly faculty & weekly staff meetings, two faculty retreats.
  - Scheduled ACO/MAT/STP courses; coordinated scheduling of all SMNS courses; opened sections as needed to address growth.
  - Evaluated SMNS faculty for promotions, tenure, and 3rd year reviews.
  - Performed annual performance evaluations of SMNS faculty members (based on Personnel Committee recommendations), and of all SMNS staff.
  - Performed in-class peer evaluation of half of SMNS faculty members each year.
  - Evaluated and hired candidates for the positions of Instructor, Faculty Associate, Instructional Lab Assistant
  - Met and/or communicated with relevant individuals to address concerns by/about students and/or faculty regarding SMNS students, classes, faculty, and other challenges and opportunities.

- SMNS Associate Director (**2015-2018**)
  - Coordinated program assessment for all SMNS program leads.
  - SMNS Scheduling ACO/MAT/STP courses (**2015-2018**)
  - SMNS Faculty (Peer) Evaluations (**2015-2018**)
  - Helped evaluate candidates for the position of Instructor and Faculty Associate

- School of Mathematical & Natural Sciences (SMNS) Program Lead for Applied Mathematics (**2016-2018**)
  - Annual Program Assessment in Applied Mathematics
  - ACETS course transfer representative.
  - Oversaw and coordinated curricular changes within Program
- SMNS M.S. Degree Development Committee (**Chair, 2015-2019**)
  Chaired committee of 6 faculty to create the first STEM graduate degree on ASU's West Campus.
- Created new graduate biomath course for M.S. in degree (LSC 562)
- SMNS Hiring Committee for Applied Mathematics Instructor (**Chair, 2015, 2017**)
- SMNS Hiring Committee for Tenured/Tenure-track Faculty
  - Statistics (**Chair, 2017-2018**)
  - Applied Mathematics (**Chair, 2012-2013**)
  - Applied Computing (**Member, 2007-2008, 2009-2010**)

Chaired hiring committee for an Assistant/Associate Professor positions; advertised position, reviewed applications; conducted Skype and on-campus interviews; coordinated with candidates and faculty at each step.

- SMNS Personnel Review Committee* (Member, 2020)
  Evaluated applications for sabbatical
- SMNS Personnel Review Committee* (**Chair 2010-2013**; Member, 2008-2010)
  Performed Faculty Annual Reviews (FAR) of SMNS faculty members and gave recommendations to the SMNS Director. Rewrote both FAR document and Promotion & Tenure document that govern SMNS, first when we combined departments to become a School and again when instructed by the Provost's Office.
- Applied Math Degree Implementation Committee (**Chair, 2007-2010**)
  Wrote B.S. in Applied Mathematics degree program in consultation with 3 other Applied Math faculty and all SMNS faculty.
- Created two new math courses for B.S. in Applied Math degree (MAT 350, MAT 450)
- 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 (**Chair, 2020** for 2 committees; Member, 2015; **Chair, 2011; Chair, 2010**; Member, 2008)
  Chaired and served on School-level tenure and promotion committee; evaluated promotions for Assistant Professors and Lecturers.
- Society for Industrial and Applied Mathematics (SIAM) West Campus - Chapter Advisor
- SMNS Peer Review Committee - Lecturer Review (Member, 2012)
- Mathematical Sciences & Applied Computing (MSAC) Math Lecturer Hiring Committee (**Chair, 2007-2008**)
- SMNS *Math Faculty Brown Bag Lunch* Panelist (2017- present)
- SMNS *Pizza, Professors, and Profession* Panelist (2016, 2017)

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)
- Department Textbook Committee (2006-2007)

Cornell University, Center for Applied Mathematics Service:

- Degree Requirements Committee, Member (1998-1999);
- Bill Sears Seminar Committee, Member (1995-1996).

FEATURED IN ARTICLES/ MEDIA INTERVIEWS

- Podcast for Lathisms: Latinxs and Hispanics in the Mathematical Sciences, MAA Tensor-SUMM project honoring Latinx mathematicians, January 17, 2019. `http://lathisms.org/podcasts.html` or `http://lathisms.com/2019Podcasts/Lathisms%20Wirkus.mp3`
- Profiled in AMS Hispanic Heritage Month project, "Lathisms (Latin@s and Hispanic in the Mathematical Sciences)" project & AMS Notice October issue, 2017, `http://lathisms.org/` or `http://lathisms.org/thursday-october-13th-2017.html`
- Filmed for *VME/PBS Series for Latino Youth and STEM Careers*, 2016.
- Interviewed by *ImprovScience*, 2014, `https://www.youtube.com/watch?v=_PIeLz6yVsY`.

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 452 - Introduction to Chaos and Nonlinear Dynamics
- MAT 499** - Independent Study (Capstone Course)
- STP 421 - Probability

- LSC 562** - Applied Mathematics Techniques in Biology
- AML 590 Reading and Conference
- AML 592 Research (Graduate)
- AML 792 Research (Graduate, doctoral)
- APM 792 Research (Graduate, doctoral)

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 (SMB); lifetime member
- 1997 – present: Society for Industrial and Applied Mathematics (SIAM)
- 1995 – present: Society for the Advancement of Chicanos and Native Americans in Science (SACNAS); lifetime member
- 1991 – present: Golden Key National Honor Society
- 1992 – present: Honor Society of Phi Kappa Phi; lifetime member