

ERIKA T. CAMACHO

Mathematical Sciences & Applied Computing
New College of Interdisciplinary Arts and Sciences
Arizona State University at the West Campus

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Fields of Interest: Mathematical Modeling, Dynamical Systems, Networks, Mathematical Biology, Mathematical Sociology, Differential Equations, Mathematics Education

Education

May 2003 Ph.D. in Applied Mathematics, *Cornell University, Ithaca, NY.*
Title: "Mathematical Models of Retinal Dynamics,"
Advisor: Richard H. Rand

August 2001 M.S. in Applied Mathematics, *Cornell University, Ithaca, NY.*

May 1997 B.A. in Mathematics, cum laude, *Wellesley College, Wellesley, MA.*

May 1997 B.A. in Economics, cum laude, *Wellesley College, Wellesley, MA.*

Professional Experience

8/2007 - present Assistant Professor, *Mathematical Sciences and Applied Computing, Arizona State University.*

8/2004 - 8/2007 Assistant Professor, *Department of Mathematics, Loyola Marymount University.*

10/2003 - present Co-Director, *Applied Mathematical Sciences Summer Institute (AMSSI), Loyola Marymount University & Cal Poly Pomona.*

6/2003 - 8/2003 MTBI Faculty, *Mathematical and Theoretical Biology Institute (MTBI), Cornell University / Los Alamos National Laboratory.*

5/2003 - 8/2004 Postdoctoral Research Associate, *Center for Nonlinear Studies, Los Alamos National Laboratory.*

9/2002 - 3/2003 Lecturer / Instructor, *Department of Mathematics, California State Polytechnic University, Pomona.*

1/2002 - 5/2002 Teaching Assistant, *Department of Mathematics, Cornell University.*

Summers 1998 - 2001 Teaching & Research Assistant, Tutor, *Mathematical and Theoretical Biology Institute.*

Grants (as Principal Investigator [PI])

- *Enhancement of the Mathematics Component of the 2008 SACNAS Conference*, National Security Agency, \$249,072, submitted November 2007, co-PI with S.Wirkus.
- *Applied Mathematical Sciences Summer Institute (AMSSI)*, National Security Agency, \$254,653, MSPF 07IC-043, 3/2007-2/2009, co-PIs E.Mosteig, R.Swift, S.Wirkus.

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

Grants (as co-PI)

- *UBM: Analysis of Stress in Biological Systems*, National Science Foundation \$239,460, 1/2007-12/2009, with PI B.Fitzpatrick, co-PIs E.Camacho, G.Kuleck, W.Binder, K.Dahlquist.
- *REU Site: Applied Mathematical Sciences Summer Institute (AMSSI)*, National Science Foundation, \$511,419 to Cal Poly Pomona (PI S.Wirkus, co-PI R.Swift), DMS-0453602, 4/2005-3/2008, co-PI of LMU subcontract of \$129,114 E.Camacho, E.Mosteig,.
- *Applied Mathematical Sciences Summer Institute (AMSSI)*, National Security Agency, \$75,000, MSPF-04IC-227, 3/2005-2/2006, PI S.Wirkus, co-PIs E.Camacho, E.Mosteig, R.Swift.

Publications

Peer-reviewed—submitted

- E. Camacho, S. Wirkus, “Diversifying the Research Experience: creating an REU environment that is conducive to the education of the whole person,” submitted for publication in *Proceedings of the 2006 MAA Session: Models that Work* (submission solicited by editors), American Mathematical Society, Providence, RI.

Peer-reviewed—accepted/published

- F.Berezovskaya, E.Camacho, S.Wirkus, G.Karev, “ ‘Traveling Wave’ Solutions of FitzHugh Model with Cross-diffusion,” to appear in *Mathematical Biosciences and Engineering*, 5(2).
- J.Abiva, E.Camacho, E.Joseph, A.Mikaelian, C.Rogers, J.Shelton, S.Wirkus, “Alcohol’s Effect on Neuron Firing,” *The Mathematical Scientist*, vol. 32, No. 1, June 2007.
- E.Camacho, R.Rand, H.Howland, “Dynamics of Two van der Pol Oscillators Coupled via a Bath,” *International Journal of Solids and Structures*, 41(8): 2133-2134, 2004.
- E.Camacho, R.Rand, T.Li, H.Howland, “A Mathematical Model of a Retinal Oscillator,” *Proceedings of the 2000 ASME International Mechanical Engineering Congress and Exposition, Nov.5-10, 2000, Orlando, FL, in BDE-Vol.48 “2000 Advances in Bioengineering” ed. T.Conway, pp.89-90, ASME (2000).*
- E.Camacho, R.Rand, J.Cooke, “Nonlinear Dynamics of the Bombardier Beetle,” *Proceedings of the DETC’99, ASME Design Engineering Technical Conferences, Sept 12-15, 1999, paper no. DETC99/ DAC-1234.*

Non Peer-reviewed

- L.Almada, R.Rodriguez, M.Thompson, L.Voss, L.Smith, E.Camacho, “Deterministic and Small-World Network Models of College Drinking Patterns,” <http://www.amssi.org>, 2006.

- J.Hunt, L.LaPlace, E.Miller, J.Pham, E.Camacho, S.Wirkus, "A Continuous Model of Gene Expression," California Polytechnic University Department of Mathematics & Statistics Technical Report, pp. 43-63, <http://www.amssi.org>, 2005.
- J.Abiva, E.Camacho, E.Joseph, A.Mikaelian,C.Rogers, J.Shelton, S.Wirkus, "Alcohol's Effect on Neuron Firing," California Polytechnic University Department of Mathematics & Statistics Technical Report, pp. 139-163 <http://www.amssi.org>, 2005.
- M.Colon, D.Hernandez, U.Rodriguez-Bernier, J.van Laarhoven, E.Camacho, "A Mathematical Model of Photoreceptor Interactions," *Cornell University, Department of Biological Statistics and Computational Biology Technical Report, BU-1640-M, pp. 25-69, Aug. 2003.*
- K.Lin, S.G.Schirmer, and E.T.Camacho Wirkus. "Chemical pattern formation in reaction-diffusion systems," MSRI Summer program on Dynamics of Low Dimensional Continua Technical Report, U.C. Berkeley, 1999.
- E.Camacho, J. Villareal, M. Yichoy, "Delinquency Dynamics," Cornell University, Department of Biometrics Technical Report, BU-1504-M, Jan 1997.
- M. Arias, E.Camacho, R.Castillo, D.Iniguez, E.Melon, L.Parra, "HIV-1 Replication Rate," Cornell University, Department of Biometrics Technical Report, BU-1367-M, Aug. 1996.

Expository articles

- E. Camacho, S. Wirkus, "The Applied Mathematical Sciences Summer Institute," *Proceedings of the Conference on Promoting Undergraduate Research in Mathematics*, American Mathematical Society, Providence, RI, 2007.
- S. Bozeman, E. Camacho, Epilogue for the Infinite Possibilities Conference 2005 Proceedings, pp. 71-72, February 2006.
- E. Camacho, "The Role of Mentoring in the Teaching of Mathematics," Article for Infinite Possibilities, Epilogue for the Infinite Possibilities Conference 2005 Proceedings, p. 69, February 2006; also at <http://www.ipc2005.com/mentoringandmath.htm>.

Other Grants

- *Modeling Photoreceptor Interactions*, 2005 Summer Research Grant, Loyola Marymount University, \$4000.
- *Dissertation Completion Grant*, Andrew W. Mellon Foundation, \$10,000, 2003.
- *Pre-dissertation Minority Research grant*, Andrew W. Mellon Foundation/ Social Sciences Research Council, \$5000, 1997-2001.

Invited Research Presentations

"Two Mathematical Models of a Neuron Firing Under the Influence of Alcohol or Related Drugs,"

November 2007 University of Puerto Rico, Rio Piedras Natural Sciences Week, Rio Piedras, PR.

“Mathematical Models of a Neuron Firing,”

June 2007 SUMSRI REU Colloquium, University of Miami, Ohio.

“Alcohol’s Effect on Neuron Firing,”

January 2007 SIAM Minisymposium at the Joint Math Meetings, New Orleans, LA.

“Diversifying the Research Experience: creating an REU environment that is conducive to the the education of the whole person,”

January 2006 Mathematical Association of America, San Antonio, TX.

“Chaos in a Generalized Two Person Version of Rock-paper-scissors Game,”

June 2005 Social Science Research Council-Mellon Mays Conference, New York, NY.

“Co-development and Interactions of Interest Groups,”

October 2003 SACNAS Annual Conference, Albuquerque, NM.

“Dynamics of Two van der Pol Oscillator Coupled via a Bath,”

July 2004 Hope College Summer Math Seminar, Holland, MI.

May 2003 SIAM Dynamical Systems Annual Conference, Snowbird, UT.

October 2002 Ford Annual Conference, Albuquerque, NM.

“A Mathematical Model of a Retinal Oscillator,”

June 2001 Mellon Fellows Summer Conference, Durham, NC.

“Nonlinear Dynamics of the Bombardier Beetle,”

May 1999 SIAM Annual Conference, Atlanta, GA.

Research Presentations

“ ‘Traveling Wave’ Solutions of the Fitzhugh Model with Cross-diffusion,”

February 2007 Arizona State University Interdisciplinary Math Seminar, Phoenix, AZ.

“Alcohol’s Effect on Neuron Firing,”

November 2007 Infinite Possibilities Conference, North Carolina State University, Raleigh, NC.

February 2007 Arizona State University Interdisciplinary Math Seminar, Phoenix, AZ.

“Modeling Biological Rhythms with Differential Equations,”

July 2006 SIAM Annual Conference, Boston, MA.

April 2006 Math Seminar at Pepperdine University, Malibu, CA.

November 2005 Loyola Marymount Math Department Colloquium, Los Angeles, CA.

“Photoreceptors, Evolutionary Games, and Differential Equations,”

November 2005 Whittier College, College of Science and Eng. Colloquium, Whittier, CA.

June 2005 Cal Poly Pomona Math & Statistics Department Colloquium, Pomona, CA.

“Chaos in a Generalized Two Person Version of Rock-paper-scissors Game,”

April 2005 Infinite Possibilities Conference, Atlanta, GA.

“Two Mathematical Models of Photoreceptor Dynamics,”

April 2005 Occidental College Mathematics Dept Colloquium, Pasadena, CA.

“Modeling Circadian Rhythms in the Eye,”

February 2005 Cal State Univ-San Bernadino Math Dept Colloquium, San Bernadino, CA.

“A Mathematical Model of a Retinal Oscillator,”

April 2003 Biophysics Journal Club, Los Alamos, NM.

Invited Talks

- *The Importance of Mentoring in Overcoming Adversity*, Natural Sciences Week at University of Puerto Rico, Rio Piedras, PR, November 2007.
- *Mentors and Role Models*, Keynote Address at Compact for Diversity Institute, Arlington, VA, October 2007.
- *The Role of Mentoring in Pursuit of a Higher Degree*, Distinguished Speaker at Summer Success Institute, University of Maryland’s AGEP, August 2007.
- *My Career Path from East Los Angeles to an Ivy League Doctoral Degree*, the Hispanics and Latinos in the Humanities and Sciences Two Day Interdisciplinary Event, City University of New York (CUNY) - Queensborough, March 2006.
- *Stand and Deliver: My Experience with Jaime Escalante as Teacher, Role Model, and Mentor*, the Hispanics and Latinos in the Humanities and Sciences Two Day Interdisciplinary Event, City University of New York (CUNY) - Queensborough, March 2006.

Invited National Workshop Presentations

- *Predoctoral and Dissertation Sciences Workshop*, Ford Foundation Conference of Fellows: “Activism Allied with Scholarship: Marshalling the Tools to Strengthen our Imperiled Communities,” The National Academies Beckman Center, Irvine, CA, October 2007.
- *Successful Networking Practices*, Infinite Possibilities Conference, North Carolina State University, Raleigh, NC, October 2007.
- *Predoctoral and Dissertation Sciences Workshop*, Ford Foundation Conference of Fellows: “Enriching Our Communities,” The National Academies, Washington, DC, October 2006.
- *Predoctoral Sciences Workshop*, Ford Foundation Conference of Fellows, “Engaging Scholars in Transition,” The National Academies, Washington, DC, September 2005.
- *Natural Sciences Dissertation Workshop*, Ford Foundation Conference of Fellows, San Juan, PR, October 2003.

Invited Panelist

- *Mentoring for Postdoctoral Fellows*, Compact for Diversity Institute, Arlington, VA, October 2007.
- *The Spectrum of Undergraduate Research Programs*, PURM Conference, Chicago, IL, September 2006.
- *Success in Graduate School*, SACNAS, Tampa, FL, October 2006.
- *Women in Science and Medicine Panel I: Careers Options*, Wellesley College Alumnae Association’s Making Connections ALANA Forum, Wellesley, MA, October 2005.

- *Women in Science and Medicine Panel II: Balancing Family Life & Career*, Wellesley College Alumnae Association's Making Connections ALANA Forum, Wellesley, MA, October 2005.
- *Career Experiences in Math and Science*, Barnard College, Social Science Research Council-Mellon Mays Conference, New York, NY, June 2005.
- *Rewards of Mathematics*, Spelman College, Infinite Possibilities Conference, Atlanta, GA, April 2005.

Advisory Boards/Committee

- Center for Undergraduate Research in Mathematics (CURM), Brigham Young University, advisory member along with Aparna Higgins, Joe Gallian, Judy Walker, Darren Narayan, and Zsuzsanna Szaniszlo
- SIAM Advisory Committee

Undergraduate Projects Supervised (or Co-supervised)

13. "A Network Model for the "Melting Pot" of Cultures," Kamuela (Wela) Yong (LMU student), Fall 2006, Winter 2007.
12. "A Deterministic Mathematical Model of the "Melting Pot" of Cultures," Marytherese Padberg (LMU student), Fall 2006.
11. "Becoming Greek: Joining the Fraternity Lifestyle," Enrique Schulz-Figueroa (LMU student), Fall 2006.
10. "A Mathematical Model for Gene Expression," Nathan Wanner (LMU student), Fall 2006.
9. "Deterministic and Small-World Network Models of College Drinking Patterns," Supervised Lorenzo Almada, Roberto Rodriguez, Melissa Thompson, Lori Voss (AMSSI students), Summer 2006.
8. "A mathematical model of the effect of environmental effects on long jump performance of world class athletes," Tade Souaiaia (LMU student), Fall 2005.
7. "Is college age drinking becoming a problem? - A mathematical analysis," Jeannine Abiva (LMU student), Fall 2005.
6. "Is the Varicella-Zoster Vaccination Really Working?," Katie Tyler (LMU student), Fall 2005.
5. "Modeling the Spread of Rumors," Paul Schroeder (LMU student), Fall 2005.
4. "How the African elephant population is beginning to stabilize," Miguel Aceves (LMU student), Fall 2005.
3. "Alcohol's Effect on Neuron Firing," Supervised Charles Rogers, Jeannine Abiva, Edna Joseph, Arpy Mikaelian (AMSSI students), Summer 2005.

2. “A Continuous Model of Gene Expression,” Supervised Elizabeth Miller, Jason Pham, Lissette LaPlace, Joseph Hunt (AMSSI students), Summer 2005.
1. “A Mathematical Model of Photoreceptor Interactions,” Supervised Miguel Colon, Daniel Hernandez, Ubaldo Rodriguez-Bernier, Jon van Laarhoven (MTBI students), Summer 2003.

Recognition of Supervised Undergraduate Projects

- “A Mathematical Model for Gene Expression,” Nathan Wanner (LMU student)
 - *Synthesis to Systems Poster Session Award*, SDCSB Symposium (he was the only undergraduate presenter), San Diego, CA, January 2007.
 - *Profiled in Argonaut Newspaper*, Weekly Westchester newspaper interview; see www.argonautnewspaper.com/articles/2007/02/22/news_-_features/westchester/w3.txt
 - Profiled in *Vistas Magazine*, LMU, to appear Spring 2007
- “Deterministic and Small-World Network Models of College Drinking Patterns,” Lorenzo Almada, Roberto Rodriguez, Melissa Thompson, Lori Voss (AMSSI students)
 - *MAA Poster Session Award*, MAA Undergraduate Poster Session, New Orleans, LA, January 2007.
- “Alcohol’s Effect on Neuron Firing,” Charles Rogers, Jeannine Abiva, Edna Joseph, Arpy Mikaelian (AMSSI students),
 - *SIAM Poster Session Award*, Society for Industrial & Applied Mathematics 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 Mathematical Model of Photoreceptor Interactions,” Miguel Colon, Daniel Hernandez, Ubaldo Rodriguez-Bernier, Jon van Laarhoven (MTBI students),
 - *SACNAS Poster Session Award*, Graduate and Undergraduate Poster Session, Albuquerque, NM, October 2003.

Organizational Activities

Steering Committee for National Conferences

- Co-Chair, Ford Foundation Conference of Fellows, Irvine, CA, 10/2007.
- Member, Infinite Possibilities Conference, Spelman College, 10/2007.
- Member, Ford Foundation Conference of Fellows, Washington, DC, 10/2006.
- Member, Ford Foundation Conference of Fellows, Washington, DC, 9/2005.

- Member, Infinite Possibilities Conference, Spelman College, 4/2005.

Summer Undergraduate Research Institutes Organized & Directed

- Co-Director, *Applied Mathematical Sciences Summer Institute (AMSSI)*, Cal Poly Pomona and Loyola Marymount University, (2005-present). Co-directed summer research program with Prof. Stephen Wirkus 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 group research projects which culminated in poster and oral presentations as well as Technical Reports.

Proposed, Accepted, and Chaired National Conference Sessions

- *New Generation of Mathematics Ph.D.s - Research Talks*, Society for Advancement of Chicano and Native Americans in Science (SACNAS) Annual Conference, Kansas City, MO, October 2007.
- *Women at the Interface of Mathematics and Biology*, SIAM Annual Conference, Boston, MA, July 2006.
- *New Generation of Mathematics Ph.D.s - Research Talks*, SACNAS Annual Conference, Tampa, FL, October 2006.
- *New Generation of Mathematics Ph.D.s - Research Talks*, SACNAS Annual, Denver, CO, October 2005.

Chaired and Organized Sessions at National Conferences

- *Mathematics, Physical Science & Engineering Academic Exchange Session*, Ford Foundation Conference for Fellows, Washington, DC in 9/2005.
- *Interdisciplinary Courses*, MAA Annual Conference: Project NExT, Atlanta, GA, 1/2005.
- *Poster Session*, Ford Foundation Conference for Fellows, Washington, DC in 9/2005.
- *Modeling Our World*, Andrew Mellon Minority Conference, St. Louis, MO, 6/2004.
- *Mathematics, Physical Science & Engineering Academic Exchange Session*, Ford Foundation Conference for Fellows, San Juan, Puerto Rico, 10/2003.

Other Service Activities

- Infinite Possibilities Conference, Publicity Sub-committee, Atlanta, GA, April 2005.
- Judge for Association of Women in Mathematics Essay Contest, December 2004
- Judge for Undergraduate Poster Session, MAA Annual Conference: Project NExT, Atlanta, GA, 1/2005.

- Judge for Association of Women in Mathematics *Biographies of Contemporary Women in Mathematics* Essay Contest, December 2003
- Reviewed a prospective differential equations textbook *Differential Equations in Science and Engineering*, by V.W. Noonburg and R. Decker, for publisher: Pearson Education.
- Reviewer for Chicana/ Latina Studies: the Journal of Mujeres Activas en Letras y Cambio Social (MALCS), 2005.

Outreach Activities

- Latino Scholars Day 2006, faculty panelist; for recruitment of prospective LMU students and their parents, organized by Office of Undergraduate Admission, panel addressed various academic aspects and expectations at LMU, November 2006.
- Amino Leadership Charter High School Dialogue with Teachers, college faculty panelist; one-day meeting to discuss expectations of colleges and how high school teachers can better prepare their students for success in college, August 2006.

Professional Development

- Participated in two Center for Teaching Excellence workshops.
- Participated in the 2nd year faculty Pedagogy Workshops on "Creating the Inclusive Classroom at LMU."
- Participated in BioQUEST Curriculum Consortium workshop: Investigating Interdisciplinary Interactions, at Beloit College, June 11-19, 2005. (Applicants were accepted on a competitive basis.)
- Participated in Project NExT (New Experiences in Teaching). (Applicants were accepted on a competitive basis.)

ASU Committees

University: Ad Hoc Committee of Student Research and Creative Performance Exhibition.

New College of Interdisciplinary Arts & Science: Graduate Committee.

Mathematical Sciences & Applied Computing Department: Lecturer Hiring Committee.

LMU Committees

University: Intercultural Faculty Committee; LMU Latina Collective; LMU Latino Spiritual Retreat 2005, Organizing Committee.

College of Science & Engineering: Presidential Position in Biomath Search Committee.

Math Department: Careers Committee; Pi Mu Epsilon Advisor; Math Club Advisor; Colloquium Committee; Co-founder and Advisor of SIAM Student Chapter.

Honors and Awards

Interdisciplinary Research, LMU Sponsored Projects Office Achievement Award, 2/2007

Leader and Mentor in Undergraduate Research Citation, National Security Agency, 9/2006

Fulfilling LMU's Mission, LMU Sponsored Projects Office Achievement Award, 2/2006

Elected to Sigma Xi, 2005/2006

Leitzel Project NExT (New Experiences in Teaching) Fellow

Ford Foundation Fellow

Sloan Fellow

Social Science Research Council-Mellon Mays Fellow

Newspaper Publicity

- Profiled for Leadership Skills in *SACNAS News*, "They May Not Call Themselves Leaders: Profiles of Leadership in Action," Interviewed over e-mail in January 2007, appeared in Spring 2007.
- Interviewed for AMSSI in *La Opinion* Los Angeles Spanish Newspaper in Section Vida y Estilo. "Mas Latinos En las Matematicas: Un instituto de ciencias ofrece oportunidades de aprendizaje y trabajo a estudiantes de minorias etnicas," written by Patricia Prieto, (Translation: "More Latinos in Mathematics: An institute in the sciences offers opportunities in learning and future careers for underrepresented minority students"), Interview on 11/9/2005, Appeared on 11/21/2005.
- Featured in *SIAM News* for Diversity Day 2006. Appeared Volume 39, number 8, October 2006 issue; see also, www.siam.org/news/news.php?issue=0039.08.

Membership

Chicano/Latino Faculty & Staff Association

Sigma Xi, Scientific Research Society

Pi Mu Epsilon, Honorary National Mathematics Society

Society for Industrial and Applied Mathematics (SIAM)

Mathematical Association of America (MAA)

Society for Advancement of Chicanos and Native Americans in Science (SACNAS)