Vita

Name	Ernest J. Barany
Post	Professor Department of Mathematical Sciences New Mexico State University Las Cruces, NM 88003
Telephone email	(575)646-3901 ebarany@nmsu.edu

Previous Employment

- 2010-2018 Professor and Associate Department Head, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM
- 2006-2010 Professor, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM
- 1997-2006 Associate Professor, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM
- 2001-2002 Senior Research Scientist, Institute for Complex Additive Systems Analysis, New Mexico Tech, Socorro, NM (On leave from NMSU.)
- 1992-1997 Assistant Professor, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM
- 1989-1992 Visiting Assistant Professor, Department of Mathematics, University of Houston, Houston, TX
- 1988-1989 Lecturer, Department of Physics, The Ohio State University and Part-Time Faculty at Columbus State Community College, Columbus, OH
- 1980-1988 Graduate Teaching Associate, Department of Physics, The Ohio State University, Columbus, OH

Degrees B.S. Physics, Indiana University, Aug. 1980 Ph.D. Physics, Ohio State University, Aug. 1988

Research Interests

- Mathematical modeling of biological systems. Modeling of evolutionary change by bifurcations
- Simulation and analysis of hybrid dynamical models of computer and communication networks and electric power networks.
- Modeling, simulation and control of large, decentralized automatic systems (SCADA systems).
- Control theory, adaptive control and identification, mechanical systems.
- Dynamical systems, equivariant dynamics, bifurcation theory.

Publications

- Abu-Rqayiq, A., E. Barany (2019). Singularity of Lotka-Volterra Models Under Unfoldings. Math Meth Appl Sci, 42(1), 1-13, April 2019
- Izadi, M., A. Sanyal, E. Barany and S. Prabhakaran, "Rigid Body Motion Estimation based on the Lagrange-d'Alembert Principle", Proc 54th IEEE Conference of Decision and Control, Osaka, Japan, December 2015.

- Vivas-Barber, A., C. Castillo-Chavez and E. Barany, "Dynamics of an SAIQR Influenza Model", Biomath, 3(2), October, 2014
- Birand, A. and E. Barany, "Evolutionary Dynamics through Multi-species Competition", *Theoretical Ecology*, 7(4), May 2014
- 5. Barany, E., "Bifurcation as the source of polymorphism", Proceedings of COMPLEX 2012, Santa Fe, December 2012.
- Shpak, M., S. Orzack and E. Barany, "The influence of demographic stochasticity on evolutionary dynamics and stability", *Theoretical Population Biology*, 88 pp47-56, 2013
- 7. Galayda, S. and E. Barany, "Stochastic Differential Equation Derivation: Comparison of the Markov Method versus the Additive Method". *Physica A* **391** (20), pp 4564-4574, 15 October 2012
- 8. Barany, E., M.P. Beccar Varela, I. Florescu and I. SenGupta. Detecting market crashes by analyzing long memory effects using high frequency data. *Quantitative Finance*, **12**, #4, pp623-634, Jan 2012
- 9. Barany, E., M.P. Beccar Varela. Stochastic differential equations and Levy models with applications to high-frequency data, *Handbook of Modeling High-Frequency Data*, pp327-346, Wiley, Hoboken NJ 2012
- Barany, E., M.P. Beccar Varela. Long Correlations applied to the study of memory effects in high frequency (tick) data, the Dow-Jones index and international indices. *Handbook of Modeling High-Freugency Data*, pp119-164, Wiley, Hoboke, NJ 2012
- Ballyk, Mary; Barany, Ernest The role of resource types in the control of chemostats using feedback linearization *Ecological Modelling* 211 #1-2 Pages: 25-35, FEB 24 2008
- Ball, Steven; Barany, Ernest; Schaffer, Steve; Wedeward, Kevin Nonlinear controllability of singularly perturbed models of power flow networks. Int. J. Pure Appl. Math. 47 (2008), no. 2, 243–266.
- 13. Ballyk, M. and E. Barany, "The role of resource type in the control of chemostats using feedback linearization", Proc. of Amer. Cont. Conf., New York, NY, July 2007
- 14. Barany, E. and M. Krupa, "Stability of multiple access network control schemes with carrier sensing and exponential backoff", *Physica A*, **363**, pp573-590, May, 2006
- Golinski, M., E. Barany, M. Ballyk, "Ecological conditions that favor the evolution of intermediate virulence in an environmentally transmitted parasite." *Journal of Mathematical Biology* 51 389-402, 2005
- Ball, S., E. Barany, S. Schaeffer and K. Wedeward, "Nonlinear Control of Power Network Models using Feedback Linearization", Proc. IASTED conference on Circuits, Signals and Systems, Marina del Rey, CA, pp20-25, October 2005
- Ball, S., E. Barany, S. Schaeffer and K. Wedeward, "A Reduced Generator Model with Excitation Limits", Proc. IASTED Conference on Power and Energy Systems, Marina del Rey, CA, pp100-105, October (2005)
- Barany, E., Schaeffer, S., Wedeward, K., Ball, S.: "Nonlinear controllability of singularly perturbed models of power flow networks." Proceedings of 43rd IEEE Conference on Decision and Control, pp4826-4832, Bahamas, December (2004)
- Barany, E., and M. Krupa, "Emergence of critical rates in multiple access network control schemes", Proceedings of the 42nd IEEE Conference on Decision and Control, pp1592-1597, Maui, HI, December (2003)
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- 23. Colbaugh, R., E. Barany and M. Trabatti, "Control of Nonholonomic Mechanical Systems Using Reduction and Adaptation", *Robotica*, **17**(3), pp249-260, 1999
- 24. Barany, E. and R. Colbaugh, "Identification in the Presence of Symmetry: Oscillator Networks", Proc. 38th IEEE Conference on Decision and Control, pp 1059-1064, Phoenix, AZ, December 1999
- Colbaugh, R., E. Barany and K. Glass, "Identification of SCADA Systems: Case Studies", Proc. 38th IEEE Conference on Decision and Control, Phoenix, AZ, pp63-68, December 1999
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- Barany, E, R. Colbaugh and K. Glass, "Control of symmetric mechanical systems with incomplete model information using reduction, dynamic feedback and flatness", (Invited paper) 1999 Amer. Control Conf., pp3505-3509, San Diego, CA, June 1999
- Barany, E. and R. Colbaugh, "Global Stabilization of Uncertain Mechanical Systems With Bounded Controls", International Journal of Robotics and Automation, Vol. 13, Vol. 2, pp48-53, 1998
- Colbaugh, R., E. Barany and K. Glass, "Adaptive Control of Nonholonomic Robotic Systems", Journal of Robotic Systems, 15(7), pp365-393, 1998
- Colbaugh, R., E. Barany and K. Glass, "Adaptive Stabilization of Uncertain Nonholonomic Mechanical Systems", *Robotica*, 16(2), pp181-192, 1998
- Colbaugh, R., E. Barany and K. Glass, "Adaptive Control of Constrained Robotic Systems for Waste Management Applications", International Journal of Environmentally Conscious Design and Manufacturing, 7(1), 1998
- Barany, E., K. Glass, and R. Colbaugh "Control of Uncertain Nonholonomic Mechanical Systems Using Differential Flatness", Proc. 1998 American Control Conference, pp917-921, Philadelphia, PA, June 1998
- Colbaugh, R. and E. Barany, "Global Stabilization of Uncertain Mechanical Systems with Bounded Controls", Proc. 1998 American Control Conference, pp2212-2216, Philadelphia, PA, June 1998
- 34. Colbaugh, R. and E. Barany, "Global Stabilization of Uncertain Underactuated Mechanical Systems", Proc. 37th IEEE Conference on Decision and Control, pp4553-4554, Tampa, FL, December 1998
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- Colbaugh, R., E. Barany, and K. Glass "Adaptive Stabilization of Nonholonomic Mechanical Systems", Proc. 1997 IEEE Conference on Decision and Control, pp3081-3088, San Diego, CA, December, 1997
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PhD students

- 1. Noussi, Hubert, "Stabilization of Chemostats via Feedback Linearization", 2008
- 2. Galayda, Suzanne, "Effect of the diffusion coefficient on noise expression in the logistic equation and single microbe model of the chemostat", 2010
- 3. Beccar Varela, Pia, "Stochastic differential equations and Levy models with applications in finance and biology", 2011
- 4. Vivas-Mejia, Ana Luz, "Dynamics of a single-strain influenza with isolation and asymptomatic class", 2011
- 5. Abu Rqayiq, Abdullah, "Singularity of Lotka-Volterra Models Under Unfoldings", 2017