

CASEY O. DIEKMAN, Ph.D.

Department of Mathematical Sciences
New Jersey Institute of Technology
University Heights
Newark, NJ 07102-1982

(973) 596-3497
diekman@njit.edu
<https://web.njit.edu/~diekman/>

ACADEMIC POSITIONS

Fulbright U.S. Scholar, Living Systems Institute University of Exeter, Exeter, UK	2019-2020
Associate Professor, Department of Mathematical Sciences New Jersey Institute of Technology, Newark, NJ	2018-present
Assistant Professor, Department of Mathematical Sciences New Jersey Institute of Technology	2013-2018
Graduate Faculty, Federated Department of Biological Sciences NJIT and Rutgers University-Newark	2014-present
Graduate Faculty, Behavioral Neuroscience Graduate Program Rutgers University-Newark	2013-present
Member, Center for Applied Mathematics and Statistics, NJIT	2013-present
Member, Institute for Brain and Neuroscience Research, NJIT	2017-present

EDUCATION & TRAINING

The Ohio State University Postdoctoral Fellowship, Mathematical Biosciences Institute Advisors: Martin Golubitsky and Peter Thomas	Columbus, OH 2010-2013
University of Michigan Ph.D., Industrial & Operations Engineering and Bioinformatics Advisors: Daniel Forger and Vijayan Nair Thesis: <i>Modeling and Analysis of Electrical Network Activity in Neuronal Systems</i>	Ann Arbor, MI 2006-2010
Marine Biological Laboratory Summer course, Neuroinformatics	Woods Hole, MA 2008
University of Michigan M.S.E., Industrial and Operations Engineering	Ann Arbor, MI 2003-2005

PEER-REVIEWED JOURNAL PUBLICATIONS

1. Jeong Y, Dias C, **Diekman C**, Brochon H, Kim P, Kaur M, Kim Y, Jang H, and Kim Y (2019). Magnesium regulates the circadian oscillator in cyanobacteria. *Journal of Biological Rhythms*, 34:380-390.
2. Kaur M, Ng A, Kim P, **Diekman C**, and Kim Y (2019). CikA modulates the effect of KaiA on the period of the circadian oscillation in KaiC phosphorylation. *Journal of Biological Rhythms*, 34:218-223.
3. Moyer M and **Diekman CO** (2018). Data assimilation methods for neuronal state and parameter estimation. *Journal of Mathematical Neuroscience*, 8:11, doi: 10.1186/s13408-018-0066-8.
4. Belle M and **Diekman CO** (2018). Neuronal oscillations on an ultra-slow timescale: daily rhythms in electrical activity and gene expression in the mammalian master circadian clockwork. *European Journal of Neuroscience*, doi: 10.1111/ejn.13856.
5. Kass R, Amari S, Arai K, Brown E, **Diekman CO**, Diesmann M, Doiron B, Eden U, Fairhall A, Fiddyment G, Fukai T, Grun S, Harrison M, Helias M, Nakahara H, Teramae J, Thomas P, Reimers M, Rodu J, Rotstein H, Shea-Brown E, Shimazaki H, Shinomoto S, Yu B, and Kramer M (2018). Computational neuroscience: Mathematical and statistical perspectives. *Annual Reviews of Statistics*, 5:183-214.
6. **Diekman CO** and Bose A (2018). Reentrainment of the circadian pacemaker during jet lag: East-west asymmetry and the effects of north-south travel. *Journal of Theoretical Biology*, 437:261-285.
7. **Diekman CO**, Thomas P, and Wilson C (2017). Eupnea, tachypnea, and autoresuscitation in a closed-loop respiratory control model. *Journal of Neurophysiology*, 118:2194-2215.
8. Wegner S, Belle M, Hughes A, **Diekman CO**, and Piggins H (2017). Delayed cryptochrome degradation asymmetrically alters the daily rhythm in suprachiasmatic clock neuron excitability. *Journal of Neuroscience*, 37:7824-7836.
9. **Diekman CO** and Bose A (2016). Entrainment maps: A new tool for understanding circadian oscillator models. *Journal of Biological Rhythms*, 31:598-616.
10. Flourakis M, Kula-Eversole E, Hutchison A, Han T, Aranda K, Moose D, White K, Dinner A, Lear B, Ren D, **Diekman CO**, Raman I, and Allada R (2015). A conserved bicycle model for circadian clock control of membrane excitability. *Cell*, 162:836-848.

11. **Diekman CO** and Golubitsky M (2014). Network symmetry and binocular rivalry experiments. *Journal of Mathematical Neuroscience*, 4(12):1-29.
12. **Diekman CO**, Dasgupta K, Nair V, and Unnikrishnan K. (2014) Discovering functional neuronal connectivity from serial patterns in spike train data. *Neural Computation*, 26:1263-1297.
13. Terman D, Rubin J, and **Diekman CO**. (2013) Irregular activity arises as a natural consequence of synaptic inhibition. *Chaos*, 23(046110):1-20.
14. **Diekman CO**, Belle M, Irwin R, Allen C, Piggins H, and Forger D. (2013) Causes and consequences of hyperexcitation in central clock neurons. *PLOS Computational Biology*, 9(8:e1003196):1-11.
15. **Diekman CO**, Golubitsky M, and Wang Y. (2013) Derived patterns in binocular rivalry networks. *Journal of Mathematical Neuroscience*, 3(6):1-23.
16. **Diekman CO**, Fall C, Lechleiter J, and Terman D. (2013) Modeling the neuroprotective role of enhancing astrocyte mitochondrial metabolism during stroke. *Biophysical Journal*, 104:1752-1763.
17. **Diekman CO**, Golubitsky M, McMillen T, and Wang Y. (2012) Reduction and dynamics of a generalized rivalry network with two learned patterns. *SIAM Journal of Applied Dynamical Systems*, 11:1270-1309.
18. Belle M, **Diekman CO**, Forger D, and Piggins H. (2009) Daily electrical silencing in the mammalian circadian clock. *Science*, 326:281-284.
19. **Diekman CO** and Forger D. (2009) Clustering predicted by an electrophysiological model of the suprachiasmatic nucleus. *Journal of Biological Rhythms*, 24:322-333.
20. **Diekman CO**, Sastry P, and Unnikrishnan K. (2009) Statistical significance of sequential firing patterns in multi-neuronal spike trains. *Journal of Neuroscience Methods*, 182:279-284.
21. **Diekman CO**, He W, Prabhu N, and Cramer H. (2003) Hybrid methods for automated diagnosis of breast tumors. *Analytical and Quantitative Cytology and Histology*, 25:183-190.

PEER-REVIEWED CONFERENCE PAPERS

1. **Diekman CO**, Thomas P, and Wilson C. (2018) Experimental validation of a respiratory control model. *Conf Proc IEEE Eng Med Biol Soc*, 2018:5273-5276.
2. **Diekman CO**, Wilson C, and Thomas P. (2012) Spontaneous autoresuscitation in a model of respiratory control. *Conf Proc IEEE Eng Med Biol Soc*, 2012:6669-6672.

RESEARCH GRANTS

1. PI, “Multiscale Modeling of Circadian Rhythms”, Fulbright US Scholar Award, US-UK Fulbright Commission, 9/1/19 to 5/31/20; £22,500.
2. Co-PI (with Jorge Golowasch), “Neuromodulation of Crustacean Circadian Clock Oscillator”, NJIT Faculty Seed Grant, 7/1/19 to 6/30/20; \$10,000.
3. PI, “Dynamical Systems Modeling of the Basal Ganglia”, IBM Research, 9/26/18 to 12/26/18; \$17,215. JSA W1771644
4. PI, “Circadian Clock Research Consortium”, NJIT Institute for Brain & Neuroscience Research, 10/12/18 to 6/30/19; \$4,000.
5. Co-PI (PI: Ravi Allada, Northwestern University, Co-I: William Kath, Northwestern University), “Multisensory Integration by Circadian Clocks”, U.S. Army Research Office, 10/1/16 to 9/30/19; \$635,688 (\$89,482 to NJIT). Agreement No. W911NF-16-1-0584
6. PI, “CAREER: Neuronal Data Assimilation Tools and Models for Understanding Circadian Rhythms”, National Science Foundation, Division of Mathematical Sciences, 7/1/16 to 6/30/21; \$429,706. NSF-DMS 1555237
7. PI, “Modeling Circadian Clock Mechanisms from Synapse to Gene”, National Science Foundation, Division of Mathematical Sciences, 7/1/14 to 6/30/17; \$241,396 (including REU supplement). NSF-DMS 1412877
8. Co-PI (with Jorge Golowasch), “Role of ionic current co-regulation in circadian activity of 'gonadotropin-releasing hormone'-secreting cells”, NJIT Faculty Seed Grant, 11/24/15 to 6/30/16; \$10,000.
9. PI, “Neurocomputational Properties of Mammalian Clock and Non-Clock Neurons”, Burroughs Wellcome Fund Collaborative Research Grant, 1/1/13 to 12/31/14; \$3,350.
10. PI, “Mathematics of Biological Timekeeping”, Simons Foundation Collaboration Grants for Mathematicians, 9/1/14 to 8/31/19; \$35,000 (Awarded, but could not accept due to receipt of other funding).

SCHOLARSHIPS AND AWARDS

- Rising Star Research Award, NJIT College of Science and Liberal Arts 2016
- National Science Foundation Graduate Research Fellowship 2006-2010
- Nonlinear Dynamics & Stochastic Methods Conference Travel Grant 2014
- SIAM Snowbird Travel Grant 2011
- Landahl SMB Travel Grant 2009
- SAND4 Conference Travel Grant 2008
- Rackham Graduate Student Travel Award 2007-2009

INVITED SEMINARS AND COLLOQUIA

- Dynamics Seminar, University of Exeter, Exeter, UK. October 1, 2019. “Mathematical modeling of circadian rhythms: gene expression, membrane excitability, and jet lag”
- Center for Computational and Applied Mathematics (CCAM) Seminar, Purdue University, West Lafayette, IN. November 26, 2018. “Mathematical modeling of circadian rhythms: gene expression, membrane excitability, and jet lag”
- Computational Neuroscience Initiative (CNI) Seminar, University of Pennsylvania, Philadelphia, PA. May 1, 2018. “Computational modeling of circadian rhythms: gene expression, membrane excitability, and jet lag”
- Biomathematics Seminar, North Carolina State University, Raleigh, NC. October 17, 2017. “Circadian Regulation of Electrical Activity in Neurons and Cardiomyocytes”
- Applied Mathematics Colloquium, University of Cincinnati, Cincinnati, OH. September 15, 2017. “Circadian Regulation of Electrical Activity in Neurons and Cardiomyocytes”
- Center for Sleep and Circadian Biology Seminar, Northwestern University, Evanston, IL. January 19, 2017. “Entrainment Maps”
- Center for Neural Science, New York University, New York, NY. May 12, 2016. “Eupnea, Tachypnea, and Autoresuscitation in a Closed-loop Model of Respiratory Control”
- Biomathematics Colloquium, Courant Institute, New York University, New York, NY. April 19, 2016. “Multi-level Regulation in the Mammalian Circadian Clock”
- Krasnow Institute for Advanced Study, George Mason University, Fairfax, VA. April 11, 2016. “Multi-level Regulation in the Mammalian Circadian Clock”
- Biophysics, University of California, San Diego, CA. June 11, 2015. “Multi-level Organization of the Mammalian Circadian Clock”
- Computational Neuroscience Seminar, Brandeis University, Waltham, MA. May 18, 2015. “Multi-level Organization of the Mammalian Circadian Clock”,
- Mathematics Department Colloquium, University of Scranton, Scranton, PA. October 21, 2014. “Mathematical Modeling of Circadian Clocks and Binocular Rivalry”,
- Faculty of Life Sciences, University of Manchester, Manchester, UK. January 13, 2014. “Introduction to Data Analysis in R: Effects of Daylength on Electrical Properties of *Per1* Neurons”
- Computational Biology Seminar, IBM T.J. Watson Research Center, Yorktown Heights, NY. January 6, 2014. “Modeling Membrane Excitability and Gene Expression Rhythms in the Mammalian Circadian Clock”
- Center for Sleep and Circadian Biology Seminar, Northwestern University, Evanston, IL. August 19, 2013. “Modeling the Link Between Membrane Dynamics and Gene Expression Rhythms in the Mammalian Circadian Clock”
- Faculty of Life Sciences, University of Manchester, Manchester, UK. August 1, 2013. “Introduction to Nonlinear Dynamics”
- Department of Engineering Sciences and Applied Mathematics Colloquium, Northwestern University, Evanston, IL. March 20, 2013. “Linking Gene Expression Rhythms to Membrane Dynamics in the Circadian Clock”
- Exponent Inc., Menlo Park, CA. February 22, 2013. “Discovering Neuronal Connectivity from Serial Patterns in Spike Train Data”
- Department of Mathematical Sciences, February 12, 2013. New Jersey Institute of Technology, Newark, NJ. “Linking Gene Expression Rhythms to Membrane Dynamics in the Circadian Clock”

- Center for Naval Analyses, Alexandria, VA. January 30, 2013. “Modeling and Analysis of Electrical Network Activity in Neuronal Systems”
- Institute for Defense Analyses, Alexandria, VA. January 29, 2013. “Modeling and Analysis of Electrical Network Activity in Neuronal Systems”
- Mathematical Life Sciences Seminar, Case Western Reserve University, Cleveland, OH. May 4, 2012. “Spontaneous Autoresuscitation in a Model of Respiratory Control”
- Center for Neural Science, New York University, New York, NY. March 1, 2010. “Modeling the Electrophysiology of the Mammalian Circadian Clock”
- Division of Sleep Medicine, Harvard Medical School, Boston, MA. February 26, 2010. “A Network Model of the Suprachiasmatic Nucleus”
- Department of Industrial and Systems Engineering, University of Florida, Gainesville, FL. February 11, 2010. “Discovering Network Properties of Neuronal Systems through Modeling and Analysis”
- Faculty of Life Sciences, University of Manchester, Manchester, UK. June 30, 2008. “Mathematical Modeling of the Suprachiasmatic Nucleus”

INVITED CONFERENCE TALKS

- Institute for Brain & Neuroscience Research Showcase, NJIT, April 29, 2019. “Overview of circadian clock consortium”
- STEM Faculty Presentations, Essex County College, February 28, 2019. “Mathematical modeling of circadian rhythms and cancer therapy”
- MBI Workshop on Control and Modulation of Neuronal Systems, Ohio State University, Columbus, OH. September 11, 2017. “Eupnea, Tachypnea, and Autoresuscitation in a Closed-Loop Respiratory Control Model”
- SIAM Conference on Applications of Dynamical Systems, Snowbird, UT. May 22, 2017. “Reentrainment of the Circadian Pacemaker”
- SIAM Conference on the Life Sciences, Boston, MA. July 13, 2016. “Intra- and Intercellular Roles of Hyperexcitation in Circadian Clock Neurons”
- Frontiers in Applied and Computational Mathematics (FACM) Conference, June 4, 2016. New Jersey Institute of Technology, Newark, NJ. “Eupnea, Tachypnea, and Autoresuscitation in a Closed-loop Model of Respiratory Control”
- SAMSI Optical Imaging Workshop, Research Triangle Park, NC. February 2, 2016. “Calcium Imaging and Neuronal Dynamics”
- AMS Fall Eastern Sectional Meeting, Rutgers University, New Brunswick, NJ. November 15, 2015. “Modeling Circadian Rhythmicity of Cardiac Arrhythmias”
- SAMSI Workshop on Challenges in Linking Mathematical and Statistical Neuroscience, Boston University, Boston, MA. October 14, 2015. “Introduction to Neuronal Data Assimilation”
- From Industrial Statistics to Data Science: A Conference in Honor of Vijay Nair, University of Michigan, Ann Arbor, MI. October 2, 2015. “Discovering Neuronal Connectivity from Spike Train Data”
- European Biological Rhythms Society Meeting, Manchester, UK. August 3, 2015. “Modeling Circadian Rhythmicity of Cardiac Arrhythmias”

- Clocks Club of New England 2nd Annual Meeting, UMASS Medical School, Worcester, MA. October 25, 2014. “Modeling Circadian Transcription of Ion Channels and Cardiac Arrhythmogenesis”
- Society for Mathematical Biology Annual Meeting, Osaka, Japan. July 31, 2014. “Modeling Circadian Transcription of Ion Channels and Cardiac Arrhythmogenesis”
- SIAM Annual Meeting, Chicago, IL. July 9, 2014. “Network Symmetry and Binocular Rivalry Experiments”
- Frontiers in Applied and Computational Mathematics (FACM) Conference, New Jersey Institute of Technology, Newark, NJ. June 1, 2013. “Derived Patterns in Binocular Rivalry Networks”
- Society for Research on Biological Rhythms Meeting, Sandestin, FL. May 23, 2012. “Effects of Photoperiods on the Electrical Properties of Suprachiasmatic Nucleus *Per1* Neurons”
- MBI Workshop on Robustness in Biological Systems, Ohio State University, Columbus, OH. February 7, 2012. “Using Noisy Inputs to Prevent Infant Apnea”
- SIAM Conference on Applications of Dynamical Systems, Snowbird, UT. May 26, 2011. “Instability of Twinned Orbits in a Coupled Bursting Respiratory Neuron Model”
- SIAM Conference on the Life Sciences, Pittsburgh, PA. July 15, 2010. “Modeling the Electrical Activity of the Circadian Clock”

CONTRIBUTED CONFERENCE TALKS

- European Biological Rhythms Society Meeting, Lyon, France. August 29, 2019. “Circadian Rhythmicity of Cardiac Arrhythmias in a Computational Model of Ventricular Myocytes”
- International Conference of the Engineering in Medicine and Biology Society, San Diego, CA. September 1, 2012. “Spontaneous Autoresuscitation in a Model of Respiratory Control”
- Biomedical Engineering Society Annual Meeting, Austin, TX. October 10, 2012. “Silencing of Electrical Activity in the SCN”
- INFORMS, San Diego, CA. October 14, 2009. “Discovering Root Causes From Symptoms”
- Society for Mathematical Biology, Vancouver, BC. July 26, 2009. “Clustering and Silencing of Electrical Activity in the Suprachiasmatic Nucleus”
- Society for Research on Biological Rhythms, Sandestin, FL, May 18, 2008. “Predicting the Electrical Activity of the Suprachiasmatic Nucleus”
- Society for Neuroscience, San Diego, CA. November 3, 2007. “A Network Model of the Electrophysiology of the Suprachiasmatic Nucleus”
- IIE Regional Conference (Region 4), West Lafayette, IN. 2003. “Automated Diagnosis of Breast Tumors”

LOCAL SEMINARS

- Math Bio- Dynamical Systems Group Meeting, NJIT. February 13, 2019. “Circadian rhythms of cardiac arrhythmias”
- Neuronal Oscillations & Computational Neuroscience Journal Club, NJIT. October 25, 2017. “Circadian dynamics in measures of cortical excitation and inhibition balance”
- STG Lab meeting, NJIT. March 3, 2016. “Role of ionic current co-regulation in circadian activity of GnRH neurons”

- MATH 491 Chaos Seminar, NJIT. April 28, 2014. “Irregular Activity Arises as a Natural Consequence of Synaptic Inhibition”
- MATH 791 Graduate Student Seminar, NJIT. April 20, 2014. “Mathematical Modeling of Circadian Clocks and Binocular Rivalry”
- Mechanical and Industrial Engineering Colloquium, NJIT. October 29, 2014. “Mathematical Modeling of Circadian Clocks and Binocular Rivalry”
- Summer Graduate Program Seminar, NJIT. May 27, 2014. “Mathematical Modeling of Circadian Clocks and Binocular Rivalry”
- Mathematical Biology Seminar, NJIT. March 25, 2014. “Multi-Level Organization of the Mammalian Circadian Clock”
- MBI Postdoc Seminar, Ohio State University. February 28, 2013. “Generalized Rivalry Networks: Reduction, Dynamics, and Derived Patterns”
- MBI Postdoc Seminar, Ohio State University. January 27, 2011. “Modeling the Electrical Activity of the Mammalian Circadian Clock”
- BISTRO seminar, University of Michigan. April 21, 2009. “Clustering and Silencing of Electrical Activity in the Suprachiasmatic Nucleus”
- Bioinformatics Kick-Off Event, University of Michigan. August 30, 2007. “Modeling the Electrophysiology of the Suprachiasmatic Nucleus”

CONFERENCE POSTER PRESENTATIONS

Epstein E, Reyes K, Fagan E, Huggins F, Trinidad J, and **Diekman CO**. Exploring the Viability of a PLSR-based Machine Learning Method in Predicting Circadian Phase in Cancer Patients”, 11th Garden State-Louis Stokes Alliance for Minority Participation/Northern New Jersey-Bridges to the Baccalaureate STEM Research Conference, October 11, 2019. Rutgers University, New Brunswick, NJ.

Epstein E, Reyes K, Fagan E, Huggins F, Trinidad J, and **Diekman CO**. Exploring the Viability of a PLSR-based Machine Learning Method in Predicting Circadian Phase in Cancer Patients”, NJIT Provost High School Summer Research Symposium, August 5, 2019. Newark, NJ.

Chowdhury S, Goriachi M, Lara L, Trinidad J, Khan E, and **Diekman CO**. Mathematical Modeling of Circadian Rhythms, Tumor Growth, and Radiotherapy”, NJIT’s 12th Annual International Undergraduate Research Symposium, August 1, 2019. Newark, NJ.

Epstein E, Reyes K, Fagan E, Huggins F, Trinidad J, and **Diekman CO**. Exploring the Viability of a PLSR-based Machine Learning Method in Predicting Circadian Phase in Cancer Patients”, NJIT’s 12th Annual International Undergraduate Research Symposium, August 1, 2019. Newark, NJ.

Khan E, **Diekman CO**, Rotstein HG, and Kim YI. “Mathematical modeling of cyanobacterial circadian oscillations”, Institute for Brain and Neuroscience Research Showcase, April 29, 2019. NJIT, Newark, NJ.

Moye M and **Diekman CO**. “Data assimilations methods for neuronal state and parameter estimation”, Institute for Brain and Neuroscience Research Showcase, April 29, 2019. NJIT, Newark, NJ.

Moye M and **Diekman CO**. “Data assimilations methods for neuronal state and parameter estimation”, Workshop on Parameter Estimation for Biological Models, July 28, 2018. North Carolina State University, Raleigh, NC.

Bacote S, Castillo A, Maquiling A, Barnes T, and **Diekman CO**. “Predicting Infant Apneas from Physiological Time Series Data”, NJIT’s 11th Annual International Undergraduate Research Symposium, July 27, 2018. Newark, NJ.

McCann WJ, Bendaoud A, Slawinski T, and **Diekman CO**. “Computer Simulation of a Biophysical Pallidostriatal Network Model”, NJIT’s 11th Annual International Undergraduate Research Symposium, July 27, 2018. Newark, NJ.

Diekman CO and Bose A. “Beyond the limits of circadian entrainment: computational modeling and analysis of shift work, social jet lag, and non-24-hour sleep-wake disorder”, Society for Research on Biological Rhythms, May 13, 2018. Amelia Island, FL.

Moye M and **Diekman CO**. “Data assimilations methods for neuronal state and parameter estimation”, Institute for Brain and Neuroscience Research Showcase, March 29, 2018. NJIT, Newark, NJ.

Maquiling A and **Diekman CO**. “Mathematical modeling of a central nervous system catecholaminergic cell line”, 9th Garden State-Louis Stokes Alliance for Minority Participation/Northern New Jersey-Bridges to the Baccalaureate STEM Research Conference, October 13, 2017. Kean University, Union, NJ.

Brice A, Edwin M, Maquiling A, Mazzone A, Traore M, Wright D, and **Diekman CO**. “Mathematical modeling of a central nervous system catecholaminergic cell line”, NJIT’s 10th Annual International Undergraduate Research Symposium, July 27, 2017. Newark, NJ.

Jassim A, Haspel G, and **Diekman CO**. “Optimizing parameters to produce coherent output from a locomotion network model”, NJIT’s 10th Annual International Undergraduate Research Symposium, July 27, 2017. Newark, NJ.

Diekman CO and Bose A. “Reentrainment of the circadian pacemaker during jet lag”, Gordon Research Conference on Chronobiology, July 17, 2017. Stowe, VT.

Diekman CO. “Circadian rhythms of cardiac arrhythmias”, Frontiers in Applied and Computational Mathematics (FACM) Conference, June 24, 2017. New Jersey Institute of Technology, Newark, NJ.

Diekman CO, Wilson CG, and Thomas PJ. “Eupnea, tachypnea, and autoresuscitation in a closed-loop respiratory control model”, International Conference on Mathematical Neuroscience, June 1, 2017. Boulder, CO.

Diekman CO, Dasgupta K, Nair V, and Unnikrishan K. “Discovering functional neuronal connectivity from serial spike train data”, SAMSI Challenges in Computational Neuroscience Opening Workshop, August 18, 2015. Research Triangle Park, NC.

Diekman CO and Zaleski J. “Modeling circadian rhythmicity of cardiac arrhythmias”, University of Pennsylvania Sleep-Chronobiology Research Retreat, June 17, 2015. Philadelphia, PA.

Diekman CO, Rotstein HG, and Bose A. “Synchronization Mechanisms in Genetic Oscillator Networks”, Frontiers in Applied and Computational Mathematics (FACM) Conference, June 4, 2015. New Jersey Institute of Technology, Newark, NJ.

Diekman CO, Wilson CG, and Thomas PJ. “Eupnea, tachypnea, and autoresuscitation in a closed-loop respiratory control model”, Society for Neuroscience Annual Meeting, November 18, 2014. Washington, DC.

Rubin JE, **Diekman CO**, and Terman D. “Irregular and uncorrelated activity can arise as a natural consequence of synaptic inhibition”, Society for Neuroscience Annual Meeting, November 15, 2014. Washington, DC.

Diekman CO and Zaleski J. “Modeling circadian transcription of ion channels and cardiac arrhythmogenesis”, Sapporo Symposium on Biological Rhythms, July 26, 2014, Sapporo, Japan.

Diekman CO and Zaleski J. “Modeling circadian transcription of ion channels and cardiac arrhythmogenesis”, Society for Research on Biological Rhythms, June 15, 2014, Big Sky, MT.

Diekman CO. “Modeling hyperexcitation in circadian clock neurons”, Nonlinear Dynamics and Stochastic Methods Conference, March 10, 2014, University of Pittsburgh, Pittsburgh, PA.

Diekman CO. “Mathematical modeling of daily biological timekeeping”, NJIT New Faculty Symposium, March 6, 2014, Newark, NJ.

Diekman CO, Belle M, Irwin R, Allen C, Piggins H, and Forger D. “Causes and consequences of hyperexcitation in central clock neurons”, Gordon Research Conference on Chronobiology, July 2013, Newport, RI.

Diekman CO, Golubitsky M, Wang Y. “Derived patterns in binocular rivalry networks”, MBI Institute Partner Meeting, February 2013, Columbus, OH.

Diekman CO, Wilson C, Thomas P. “Experimental validation of a model of respiratory control”, Biomedical Engineering Society Annual Meeting, October 2012, Atlanta, GA.

Diekman CO, Wilson C, Thomas P. “Spontaneous autoresuscitation in a model of respiratory control”, Multiscale Modeling in Medicine and Biology Workshop, September 2012, Nottingham, UK.

Diekman CO, Wilson C, Thomas P. “Using noisy inputs to prevent infant apnea”, MBI Institute Partners Meeting, February 2012, Columbus, OH.

Diekman CO, Wilson C, Thomas P. “Instability of twinned orbits in a coupled respiratory bursting neuron model”, MBI Institute Partners Meeting, February 2011, Columbus, OH.

Diekman CO, Dasgupta K, Nair V, Unnikrishnan KP. “Inferring functional connectivity in neuronal networks using frequent episodes”, Society for Neuroscience 2009, Chicago, IL.

Butler P, Patnaik D, **Diekman CO**, Ramakrishnan N, Unnikrishnan KP. “The use of temporal datamining to model the *C. elegans* neuronal network”, COSYNE 2008, Salt Lake City, UT.

Diekman CO and Unnikrishnan KP, “Discovering polychronous groups by data mining multi-neuronal spike trains”, Society for Neuroscience 2008, Washington D.C.

Diekman CO, Sastry PS, Unnikrishnan KP, “Using correlation counts to infer relative strengths of connections from multi-neuronal spike trains”, SAND 2008, Pittsburgh, PA.

TEACHING HISTORY

Primary Instructor, New Jersey Institute of Technology	2013-2018
<ul style="list-style-type: none">• MATH 227 – Mathematical Modeling• MATH 676 – Advanced Ordinary Differential Equations• MATH 473/573 – Intermediate Differential Equations• MATH 373 – Introduction to Mathematical Biology• MATH 111 – Calculus I• MATH 112 – Calculus II• MATH 491 – Independent Study in Mathematics	
Primary Instructor, The Ohio State University	2012
<ul style="list-style-type: none">• MATH 556 – Differential Equations I	
Project Leader, The Ohio State University	2011
<ul style="list-style-type: none">• MATH 150 – Calculus for Life Sciences	
Guest Lecturer, University of Michigan	2010
<ul style="list-style-type: none">• MATH 462 – Mathematical Models	
Teaching Fellow, Ypsilanti High School	2007-2008
<ul style="list-style-type: none">• Prepared and taught lessons (2x/week) in support of two 9th Grade Biology classes	
Teaching Assistant, Purdue University	2002
<ul style="list-style-type: none">• Primary instructor for two laboratory sections of IE 477 (Work Methods and Measurement)	

POSTDOC AND STUDENT RESEARCH ADVISED

Postdoctoral Scholars

- Adam Ponzi, IBM researcher based at NJIT from September 2018-January 2019. Project: Dynamical systems modeling of the basal ganglia

- Pedro Vilanova, NJIT Department of Mathematical Sciences postdoc, September 2018-present. (co-mentored by several mathematical biology faculty)

Ph.D. students

- Matthew Moye, 5th year student in Applied Mathematics.
Project: Neuronal modeling and data assimilation
- Emel Khan, 4th year student in Applied Mathematics.
Project: Entrainment of biochemical oscillators (co-advised with Horacio Rotstein)
- Soheil Saghafi, 2nd year student in Applied Mathematics.
Project: Optimization of *C. elegans* locomotion model using differential evolution

M.S. students

- Timothy Barnes, Physics, graduating Spring 2018
Project: Effects of noise on closed-loop respiratory control
- Antonio Jurko, Applied Mathematics, graduated Spring 2016
Project: Locomotion in *C. elegans*
- Hamza Ahmad, Applied Mathematics, left program in 2015
Project: Locomotion in *C. elegans*

Undergraduate students

- Jonathan Trinidad, Biological Sciences (2018-2019). Project: Circadian rhythms in cancer biology. Supported by NSF CAREER.
- William (Joe) McCann, Applied Mathematics (2018). Project: Dynamics of neurodegenerative disease. Supported by NSF EXTREEMS-QED.
- Thomas Slawkinski, Applied Mathematics (2018). Project: Dynamics of neurodegenerative disease. Supported by NSF EXTREEMS-QED.
- Amina Bendaud, Mathematical Sciences & Biological Sciences (2018). Project: Dynamics of neurodegenerative disease. Supported by NSF EXTREEMS-QED.
- Peter Eskander, Mathematical Biology (2017). Project: Electrophysiology of GT1-7 cells. Supported by NSF REU supplement.
- Binah Ezra, Mathematical Biology (2016-2017). Project: Modeling of GT1-7 cells. Supported by NSF CAREER.

- Alina Mohit-Tabatabai, Mathematical Biology (2017). Project: Electrophysiology of CAD cells. Supported by NSF CAREER.
- Alexis Brice, Electrical and Computer Engineering (2017). Project: Modeling of CAD cells. Supported by NSF CAREER.
- Amin Jassim, Applied Mathematics (2017). Project: Optimal neuronal network for *C. elegans* locomotion. Supported by NJIT Provost Fellowship.
- Rebecca Deek, Biological Sciences, graduated Spring 2016 (now a M.S. student at Columbia University). Project: Electrophysiology of SCN 2.2 cells. Supported by NSF REU supplement.
- Joe Ballardo, Mathematical Biology, graduated Spring 2017 (now a M.S. student at University of Michigan). Project: Data-driven biophysical modeling of neuronal dynamics. Supported by NSF EXTREEMS-QED.
- Nilanjan Haldar, Biological Sciences (2015-2016). Project: Data-driven biophysical modeling of neuronal dynamics. Supported by NSF EXTREEMS-QED.
- Jonathan Dougherty, Electrical and Computer Engineering (2015-2016). Project: Data-driven biophysical modeling of neuronal dynamics. Supported by NSF EXTREEMS-QED.
- Joe Zaleski, Applied Mathematics, graduated Spring 2015 (now a Ph.D. student at Rensselaer Polytechnic Institute). Project: Circadian cardiac excitability. Supported by NJIT Provost Fellowship.

Community college students

- Essex County College (2019): Elizabeth Epstein, Mariia Goriachi, Luis Lara, and Karen Reyes. Project: Circadian rhythms in cancer biology. Supported by NSF CAREER.
- Essex County College (2018): Sean Bacote, Angela Castillo, and Alyssa Marie Maquiling. Project: Predicting infant apneas based on physiological time series data. Supported by NSF CAREER.
- Essex County College (2017): Mahamadi Compaore, Michael Edwin, Serge Fopposi, Alyssa Marie Maquiling, Alfonse Mazzoni, Edwin Mwallo, Ralph Erickson Suarez, Mohamed Traore, and Daquan Wright. Project: Modeling of CAD cells. Supported by NSF CAREER.
- Kartik Patel, Bergen Community College (2014). Project: Numerical simulation of cardiac electrophysiology. (now an undergrad at NJIT)

High school students

- Evan Fagan (Summer 2019), Columbia High School, Maplewood, NJ. Project: Circadian rhythms in cancer biology
- Fritz Huggins (Summer 2019), Governor Livingston High School, Berkeley Heights, NJ. Project: Circadian rhythms in cancer biology

PROFESSIONAL SERVICE

- SIAM Life Sciences Activity Group Awards Committee

Workshop and Conference Organization

- Organizing Committee, Conference on “Frontiers in Applied and Computational Mathematics (FACM)”, June 24-25, 2017. Newark, NJ
- Co-organizer, Minisymposium on “Novel Applications of Discrete Maps in Neuroscience”, SIAM Conference on Applications of Dynamical Systems, May 22, 2017. Snowbird, UT
- Co-organizer, MBI Workshop on “Dynamical Systems and Data Analysis in Neuroscience: Bridging the Gap”, October 17-21, 2016. Ohio State University, Columbus, OH.
- Co-organizer, SAMSI Workshop on “Optical Imaging”, February 1-2, 2016. Research Triangle Park, NC.
- International Organizing Committee, 14th Congress of the European Biological Rhythms Society / 4th World Congress of Chronobiology, August 2-6, 2015. Manchester, UK
- Organizer and co-chair, Minisymposium on “Modeling: From Oscillators to Real-World Tools”, European Biological Rhythms Society Meeting, August 3, 2015. Manchester, UK
- Organizer and co-chair, Minisymposium on “Collective Behavior of Circadian Clocks”, Society for Mathematical Biology Annual Meeting, July 31, 2014. Osaka, Japan.
- Organizer and chair, Minisymposium on “Circadian Rhythms”, Conference on Frontiers in Applied and Computational Mathematics (FACM), May 22, 2014. Newark, NJ.
- Co-chair, Cardiopulmonary Modeling Session, IEEE EMBS 2012, San Diego, CA.
- Organizing Committee, MBI “Workshop for Young Researchers in Mathematical Biology (WYRMB)”, August 29-September 1, 2011. Columbus, OH.

Peer Reviewing

- NSF Mathematical Biology Review Panel Member, March 2015.
- Reviewer for *Physica D*, *PLOS Computational Biology*, *Biophysical Journal*, *Physics Letters A*, *PLOS ONE*, *Mathematical Biosciences*, *Journal of Theoretical Biology*, *Journal of Biological Rhythms*, *IET Systems Biology*, *Journal of Mathematical Neuroscience*, *Biological Cybernetics*, *Bulletin of Mathematical Biology*, *Communications in Nonlinear Sciences and Numerical Simulation*

Outreach

- Presenter, Sidmouth Science Festival, United Kingdom, October 12, 2019
 - Presented an interactive game on circadian rhythms research to the general public

- Director, Community College Biomathematical Research Initiation Program (C2BRIP), 2017-present
 - recruitment and mentorship of Essex County College students through summer research projects
- Board member, Urban Scholar Society, 2015-2016
 - a non-profit conducting educational outreach in the greater Newark area
- Served as a mentor in the Graduate Student Mentoring Program at the 2014 SMB Meeting in Osaka, Japan

University Service

- Served as a judge of graduate student poster presentations at the Dana Knox Student Research Showcase, NJIT, Newark, NJ, April 20, 2016.
- NJIT representative at the Mathematical Biosciences Institute (MBI) Institute Partner Meeting, Columbus, OH, February 6, 2014

Departmental Service

- NJIT, Department of Mathematical Sciences
 - Undergraduate Recruitment Committee, 2013-2015
 - Graduate Recruitment and Admissions Committee, 2014-2016
 - DMS Graduate Education Committee, 2015-2016
 - Undergraduate Major Advisor, 2015-2019
 - Mathematical Biology Seminar Organizer, 2014-
 - Faculty Search Committee, 2014-2015, 2017-2018, and 2018-2019
 - Postdoctoral Scholar Search Committee, 2017-2018
 - FACM Conference Organizing Committee, 2015-2016 and 2016-2017
- Ohio State University, Mathematical Biosciences Institute
 - Colloquium Committee, 2011-2012

Ph.D. Dissertation Committees

- Pyong Hwa Kim, Department of Chemistry and Environmental Science. “Bioaugmentation of Haloalkane Dehalogenase into the Cyanobacterial Genome”. Role: member. Qualifying exam date: June 24, 2019.
- Emel Khan, Department of Mathematical Sciences. “Mathematical Modeling and Analysis of the Cyanobacterial Circadian Clock”. Role: co-chair. Proposal date: April 22, 2019.
- Guangyuan Liao, Department of Mathematical Sciences. “Mathematical models for understanding the entrainment of hierarchical circadian systems”. Role: committee member. Proposal date: September 10, 2018.
- Yinbo Chen, Department of Mathematical Sciences “Nanodomains of cell membrane Ca²⁺ channels: mathematical modeling and physiological implications”. Role: committee member. Proposal date: September 7, 2018.
- Matthew Moye, Department of Mathematical Sciences. “Assimilating Neuronal Data for Biophysical Models”. Role: chair. Proposal date: January 22, 2018.

- Manpreet Kaur, Department of Chemistry & Environmental Science, “Molecular Mechanism of Cyanobacterial Circadian Oscillator”. Role: committee member. Proposal date: December 18, 2017.
- Randolph Leiser, Department of Mathematical Sciences, “Effects of Heterogeneity on Oscillatory Network Dynamics”. Role: committee member. Defense date: August 28, 2017.
- Aminur Rahman, Department of Mathematical Sciences, “Qualitative modeling and Analysis of Chaotic Logical Circuits and Walking Droplets: A Dynamical Systems Approach”. Role: committee member. Defense date: April 20, 2017
- Casayndra Basarab, Department of Mathematical Sciences, “Hamiltonian Bifurcations in Schrödinger Trimers.” Role: committee member. Defense date: August 4, 2016.

PROFESSIONAL DEVELOPMENT ACTIVITIES

Institute for Teaching Effectiveness Workshops	2017
<ul style="list-style-type: none"> • January 10, 2018 • August 31, 2017 • May 18, 2017 	
NJIT New Faculty Development Series	2015
<ul style="list-style-type: none"> • Ten workshops throughout Fall 2015 	
STEM C ² Research Summit (Bergen Community College)	2015
<ul style="list-style-type: none"> • April 17 – flipping the classroom 	
Teaching, Technology, and Learning Faculty Institute	2013
<ul style="list-style-type: none"> • August 26 -- facilitating student engagement and success • August 20 -- Learning Management Systems (Moodle) 	
University Center for Advancement of Teaching (Ohio State University)	2012
<ul style="list-style-type: none"> • Observed my teaching and provided feedback mid-term 	
Completed course in Teaching Engineering (ENGIN 580)	2009
<ul style="list-style-type: none"> • Covered learning theories, teaching strategies, course preparation 	
Participated in INFORMS Future Academician Workshop	2009
<ul style="list-style-type: none"> • Discussed engaging students and designing an effective syllabus 	

PROFESSIONAL SOCIETY MEMBERSHIPS

- Society for Industrial and Applied Mathematics (SIAM)
- Society for Mathematical Biology (SMB)
- Society for Research on Biological Rhythms (SRBR)
- Society for Neuroscience (SFN)
- American Physiological Society (APS)
- Institute of Industrial Engineers (IIE)
- Institute for Operations Research and Management Sciences (INFORMS)
- Biomedical Engineering Society (BMES)
- Biophysical Society