# CASEY O. DIEKMAN, Ph.D.

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## ACADEMIC POSITIONS

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|---|---|
| Professor, Department of Mathematical Sciences<br>New Jersey Institute of Technology, Newark, NJ | 2024-present |
| Co-Director, Mathematical and Computational Biosciences Collective<br>New Jersey Institute of Technology, Newark, NJ | 2025-present |
| Associate Professor, Department of Mathematical Sciences<br>New Jersey Institute of Technology, Newark, NJ | 2018-2024 |
| Fulbright U.S. Scholar, Living Systems Institute<br>University of Exeter, Exeter, UK | 2019-2020 |
| Assistant Professor, Department of Mathematical Sciences<br>New Jersey Institute of Technology | 2013-2018 |
| Graduate Faculty, Federated Department of Biological Sciences<br>NJIT and Rutgers University-Newark | 2014-present |
| Graduate Faculty, Behavioral Neuroscience Graduate Program<br>Rutgers University-Newark | 2013-present |
| Member, Center for Applied Mathematics and Statistics, NJIT | 2013-present |
| Member, Institute for Brain and Neuroscience Research, NJIT | 2017-2021 |

## EDUCATION & TRAINING

| | |
|---|---|
| The Ohio State University<br>Postdoctoral Fellowship, Mathematical Biosciences Institute<br>Advisors: Martin Golubitsky and Peter Thomas | Columbus, OH<br>2010-2013 |
| University of Michigan<br>Ph.D., Industrial & Operations Engineering and Bioinformatics<br>Advisors: Daniel Forger and Vijayan Nair<br>Thesis: *Modeling and Analysis of Electrical Network Activity in Neuronal Systems* | Ann Arbor, MI<br>2006-2010 |

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|---|---|
| Marine Biological Laboratory | Woods Hole, MA |
| Summer course, Neuroinformatics | 2008 |
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| University of Michigan | Ann Arbor, MI |
| M.S.E., Industrial and Operations Engineering | 2003-2005 |
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| Purdue University | West Lafayette, IN |
| B.S., Industrial Engineering (with Honors) | 1998-2002 |
| Minor in Electrical and Computer Engineering | |

## PEER-REVIEWED JOURNAL PUBLICATIONS

1. Wei N, Saghafi S, Khan E, and **Diekman CO** (2025). Modeling circadian clock regulation of immune system response to SARS-CoV-2 infection and antiviral treatment. *Journal of Biological Rhythms*, In Press.

2. Wei N and **Diekman CO** (2025). Dosing time-of-day impacts the safety of antiarrhythmic drugs in a computational model of cardiac electrophysiology. *Journal of Biological Rhythms*, 40(3):301-310.

3. Liao G, **Diekman CO**, and Bose A (2025). Dynamics of Phase Tumbling and the Reentrainment of Circadian Oscillators. *Mathematical Biosciences*, 381:109381.

4. **Diekman CO**, Thomas PJ, Wilson CG (2024). COVID-19 and silent hypoxemia in a minimal closed-loop model of the respiratory rhythm generator. *Biological Cybernetics*, 118:145-163.

5. Saghafi S, Rumbell T, Gurev V, Kozloski J, Tamagnini F, Wedgwood K, and **Diekman CO** (2024). Inferring parameters of pyramidal neuron excitability in mouse models of Alzheimer's disease using biophysical modeling and deep learning. *Bulletin of Mathematical Biology*, 86(46):1-29.

6. Khan E, Saghafi S, **Diekman CO**, and Rotstein HG (2022). The emergence of polyglot entrainment responses to periodic inputs in vicinities of Hopf bifurcations in slow-fast systems. *Chaos*, 32:063137.

7. **Diekman CO** and Bose (2022). Beyond the limits of circadian entrainment: Non-24-h sleep-wake disorder, shift work, and social jet lag. *Journal of Theoretical Biology*, 545: 111148.

8. Bano-Otalora B, Moye M, Brown T, Lucas R, **Diekman CO**, and Belle M (2021). Daily electrical activity in the master circadian clock of a diurnal mammal. *eLife*, 10:e68179.

9. Lee J, Lim C, Han TH, Andreani T, Moye M, Curran J, Johnson E, Kath W, **Diekman CO**, Lear B, and Allada R (2021). The E3 ubiquitin ligase adaptor Tango10 links the core circadian clock to neuropeptide and behavioral rhythms. *PNAS*, 119: e2110767118.

10. Creaser J, **Diekman CO**, and Wedgwood KCA (2021). Entrainment dynamics organised by global manifolds in a circadian pacemaker model. *Frontiers in Applied Mathematics and Statistics*, 7:703359.

11. **Diekman CO** and Wei N (2021). Circadian rhythms of early afterdepolarizations and ventricular arrhythmias in a cardiomyocyte model. *Biophysical Journal,* 120:319-333.

12. Liao G, **Diekman C**, and A Bose (2020). Entrainment dynamics of forced hierarchical circadian systems revealed by 2-dimensional maps. *SIAM Journal of Applied Dynamical Systems*, 19:2135-2161.

13. Kim P, Porr B, Mori T, Kim YS, Johnson CH, **Diekman CO**, and Kim YI (2020). CikA, an input pathway component, senses the oxidized quinone signal to generate phase delays in the cyanobacterial circadian clock. *Journal of Biological Rhythms*, 35:227-234.

14. 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.

15. 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.

16. Moye 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.

17. 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.

18. 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.

19. **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.

20. **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.

21. 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.

22. **Diekman CO** and Bose A (2016). Entrainment maps: A new tool for understanding circadian oscillator models. *Journal of Biological Rhythms,* 31:598-616.

23. 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.

24. **Diekman CO** and Golubitsky M (2014). Network symmetry and binocular rivalry experiments. *Journal of Mathematical Neuroscience*, 4(12):1-29.

25. **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.

26. Terman D, Rubin J, and **Diekman CO**. (2013) Irregular activity arises as a natural consequence of synaptic inhibition. *Chaos*, 23(046110):1-20.

27. **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.

28. **Diekman CO**, Golubitsky M, and Wang Y. (2013) Derived patterns in binocular rivalry networks. *Journal of Mathematical Neuroscience*, 3(6):1-23.

29. **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.

30. **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.

31. Belle M, **Diekman CO**, Forger D, and Piggins H. (2009) Daily electrical silencing in the mammalian circadian clock. *Science*, 326:281-284.

32. **Diekman CO** and Forger D. (2009) Clustering predicted by an electrophysiological model of the suprachiasmatic nucleus. *Journal of Biological Rhythms*, 24:322-333.

33. **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.

34. **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. co-PI (with Horacio Rotstein), "Mathematical and Computational Biosciences Collective (MCBC): Bridging Mathematics, Computations, Biology, and Data: From Basic Science to Industry and Back", NJIT Collaborative Research and Innovation Strategic Partnership (CRISP), 1/1/2025 to 1/1/2028; $1,222,493.

2. PI, "GOALI:  Merging Deep Learning and Mechanistic Modeling to Analyze the Electrophysiology of Circadian Clock Neurons, Aging, Cardiac Arrhythmias, and Alzheimer's Disease", National Science Foundation, Division of Mathematical Sciences, 7/15/2022 to 6/30/2025; $466,102. NSF-DMS 2152115

3. PI, "Multiscale Modeling of Circadian Rhythms", Fulbright US Scholar Award, US-UK Fulbright Commission, 9/1/19 to 5/31/20; £22,500.

4. Co-PI (with Jorge Golowasch), "Neuromodulation of Crustacean Circadian Clock Oscillator", NJIT Faculty Seed Grant, 7/1/19 to 6/30/20; $10,000.

5. PI, "Dynamical Systems Modeling of the Basal Ganglia", IBM Research, 9/26/18 to 12/26/18; $17,215. JSA W1771644

6. PI, "Circadian Clock Research Consortium", NJIT Institute for Brain & Neuroscience Research, 10/12/18 to 6/30/19; $4,000.

7. 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

8. PI, "CAREER: Neuronal Data Assimilation Tools and Models for Understanding Circadian Rhythms", National Science Foundation, Division of Mathematical Sciences, 7/1/16 to 9/30/22; $466,001 (including INTERN supplement). NSF-DMS 1555237

9. 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

10. 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.

11. 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.

12. 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 NSF funding).

## SCHOLARSHIPS AND AWARDS

- Fulbright Award Recipient                                             2019-2020
- 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

- Biology Colloquium Series, Rutgers University, Newark, NJ. December 12, 2023. "Data-driven conductance-based neuronal modeling with applications to circadian rhythms and Alzheimer's disease"
- Center for Mathematical Biology Seminar, University of Pennsylvania, Philadelphia, PA. September 18, 2023. "Data-driven conductance-based neuronal modeling with applications to circadian rhythms and Alzheimer's disease"
- Mathematical Biology Seminar, Duke University, Durham, NC (held virtually). December 2, 2022. "Data Assimilation and Dynamical Systems Analysis of Circadian Rhythmicity and Entrainment"
- DMC (Data, Mathematical, and Computational Sciences) Lecture Series, Ramapo College of New Jersey, Ramapo, NJ. September 27, 2022. "Data Assimilation and Dynamical Systems Analysis of Circadian Rhythmicity and Entrainment"
- Math Biology / Applied Dynamical Systems Seminar, Ohio State University, Columbus, OH (held virtually). February 10, 2022. "Data Assimilation and Dynamical Systems Analysis of Circadian Rhythmicity and Entrainment"
- Department of Mathematics Colloquium, University of Idaho, Moscow, ID (held virtually). January 27, 2022. "Data Assimilation and Dynamical Systems Analysis of Circadian Rhythmicity and Entrainment"
- Applied Mathematics and Scientific Computing Seminar, Temple University, Philadelphia, PA (held virtually). December 1, 2021. "Data Assimilation and Dynamical Systems Analysis of Circadian Rhythmicity and Entrainment"
- Development and Cancer Focus Group (DECAFOG) Seminar, California State University, Northridge (held virtually). July 7, 2021. "Data Assimilation and Conductance-Based Modeling of Circadian Pacemaker Neurons"

- Applied Mathematics Colloquium, New Jersey Institute of Technology, Newark, NJ. April 30, 2021. "Data Assimilation and Dynamical Systems Analysis of Circadian Rhythmicity and Entrainment"
- Centre for Biological Timing Seminar, University of Manchester, Manchester, UK (held virtually). June 10, 2020. "Data assimilation methods and modeling of circadian clock neurons"
- Quantitative Biology and Medicine Seminar, University of Exeter, Exeter, UK (held virtually). May 18, 2020. "Data assimilation and modeling of circadian clock neurons"
- Physiology, Pharmacology, and Neuroscience Seminar, University of Bristol, Bristol, UK. February 3, 2020. "Data assimilation methods for neuronal state and parameter estimation"
- Cell, Molecular, and Structural Biology Seminar, University of York, York, UK. January 19, 2020. "Mathematical modeling of circadian rhythms: gene expression, membrane excitability, and jet lag"
- 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

- Autumn UK Clock Club, University of Manchester, Manchester, UK. September 17, 2024. "Modelling circadian regulation of cardiac dynamics and dosing time-of-day effects on the safety of cardiac antiarrhythmic drugs"
- Society for Mathematical Biology 2024 Annual Meeting, Minisymposium on Biological Oscillations and Wearable Devices, Konkuk University, Seoul, South Korea. July 1, 2024. "Modeling circadian rhythms in cardiac dynamics"
- ICIAM 2023, minisymposium on Calibration and Validation of Mathematical Models for Biological Systems. Waseda University, Tokyo, Japan (presented virtually). August 20-25, 2023. "Deep hybrid modeling of neuronal dynamics using generative adversarial networks"
- Dynamical Systems in the Life Sciences, a satellite workshop of the Society for Mathematical Biology Annual Meeting. Ohio State University, Columbus, OH. July 14, 2023. "Deep hybrid modeling of neuronal dynamics"
- SIAM Conference on Applications of Dynamical Systems, Portland, OR. May 18, 2023. "Entrainment map analysis of social jet lag, non-24-hour sleep-wake disorder, and night shift work"

- SIAM Conference on the Life Sciences, Pittsburgh, PA (presented virtually). July 12, 2022. "Beyond the limits of circadian entrainment: Non-24-h sleep-wake disorder, shift work, and social jet lag"
- American Mathematical Society Spring Central Sectional Meeting (held virtually). March 26, 2022. "Data assimilation and modeling of circadian clock neurons"
- Society for Mathematical Biology Annual Meeting (held virtually). June 17, 2021. "Oxygen handling and parameter space interrogation in a minimalist closed-loop model of the respiratory oscillator"
- SIAM Conference on Applications of Dynamical Systems (held virtually). May 26, 2021. "Circadian Reentrainment Dynamics Organized by Global Manifolds"
- MBI Workshop on Mathematical and Computational Methods in Biology (held virtually), Ohio State University, Columbus, OH. May 5, 2020. "Data assimilation methods for conductance-based neuronal modeling"
- Fulbright Forum, Cardiff, UK. January 7, 2020. "Multiscale modeling of circadian rhythms"
- 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 Arrythmogenesis"
- 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

- SIAM NNP Section Annual Meeting, NJIT, Newark, NJ. October 22, 2023. "Data assimilation and conductance-based neuronal modeling"
- 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 Success Initiative (MSI) Summer Talk, New Jersey Institute of Technology, Newark, NJ. August 5, 2024. "Mathematical modeling of circadian rhythms"
- Data-Driven Methods for Dynamic Systems Reading Group, Case Western Reserve University, Cleveland, OH (talk was given virtually). August 14, 2025.
- Summer Graduate Program Seminar, NJIT. July 20, 2021. "Data Assimilation and Conductance-Based Modeling of Circadian Clock Neurons"
- Math Bio- Dynamical Systems Group Meeting, NJIT. March 10, 2021. "Beyond entrainment"
- 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

"Inferring parameters of pyramidal neuron excitability in mouse models of Alzheimer's disease using biophysical modeling and deep learning". KSMB-SMB Satellite Workshop: Tutorials for Recent Advances in Methods for Biomedical Mathematics. Institute for Basic Science, Daejeon, South Korea. June 27, 2024.

Alonge D, Rodriguez Reyes F, Uzowuru C, Saghafi S, and **Diekman CO**. "Using Deep Hybrid Modeling to Identify Biophysical Mechanisms Underlying Circadian Rhythms in Cardiac Arrhythmias", 2022 Undergraduate Summer Research and Innovation Symposium, NJIT, Newark NJ. July 27, 2022.

Saghafi S and **Diekman CO**. "Deep Hybrid Modeling of Neuronal Dynamics using Generative Adversarial Networks", Frontiers in Applied and Computational Mathematics (FACM) Conference, NJIT, Newark NJ. May 20-21, 2022.

Alonge D, Epstein E, Uzowuru C, Saghafi S, and **Diekman CO**. "Using Deep Hybrid Modeling to Determine Treatment Strategies for COVID-19 Patients", Frontiers in Applied and Computational Mathematics (FACM) Conference, NJIT, Newark NJ. May 20-21, 2022.

Botadra R and **Diekman CO**. "Modeling Pyramidal Neuron Excitability using 4-D Variational Data Assimilation", Frontiers in Applied and Computational Mathematics (FACM) Conference, NJIT, Newark NJ. May 20-21, 2022.

Uzowuru C, Alonge D, Kanwanya-Nwajueboe F, Kowal K, Saghafi S, and **Diekman CO**. "Using Deep Hybrid Modeling to Determine Treatment Strategies for COVID-19 Patients", 12th Garden State-Louis Stokes Alliance for Minority Participation/Northern New Jersey-Bridges to the Baccalaureate STEM Research Conference, February 25, 2022. (held virtually)

Uzowuru C, Alonge D, Kanwanya-Nwajueboe F, Kowal K, Saghafi S, and **Diekman CO**. "Using Deep Hybrid Modeling to Determine Treatment Strategies for COVID-19 Patients", NJIT's 13th Annual International Undergraduate Research Symposium, July 29, 2021. 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", 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, Mazzoni 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        2013-2025
- MATH 111 – Calculus I
- MATH 112 – Calculus II
- MATH 211 – Calculus III
- MATH 227 – Mathematical Modeling
- MATH 328 – Mathematical Methods for Scientists and Engineers
- MATH 373 – Introduction to Mathematical Biology
- MATH 451-H – Methods of Applied Mathematics II (Capstone II)
- MATH 491 – Independent Study in Mathematics
- MATH 473/573 – Intermediate Differential Equations
- MATH 676 – Advanced Ordinary Differential Equations

Primary Instructor, The Ohio State University        2012
- MATH 556 – Differential Equations I

Project Leader, The Ohio State University        2011
- MATH 150 – Calculus for Life Sciences

Guest Lecturer, University of Michigan        2010
- MATH 462 – Mathematical Models

Teaching Fellow, Ypsilanti High School        2007-2008
- Prepared and taught lessons (2x/week) in support of two 9th Grade Biology classes

Teaching Assistant, Purdue University        2002
- 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-January 2021. (Departmental postdoc co-mentored by several mathematical biology faculty)

**Ph.D. students**

- Matthew Moye, Applied Mathematics, Graduated May 2020
  Dissertation: Data Assimilation for Conductance-Based Neuronal Models

- Emel Khan, Applied Mathematics, Graduated May 2021 (co-advised with Horacio Rotstein)
  Dissertation: Mechanisms of Oscillations and Polyglot Entrainment in Neuronal and Circadian Models

- Soheil Saghafi, PhD student in Applied Mathematics, Graduated May 2023
  Dissertation: Deep Hybrid Modeling of Neuronal Dynamics using Generalized Adversarial Networks

- Michael Luo, PhD student in Applied Mathematics, Expected Graduation May 2026

**M.S. students**

- Elizabeth Epstein, Applied Statistics, graduated Spring 2024
  - Thesis: Comparison of methods for solving stochastic inverse problems

- Charles Mainwaring, Applied Mathematics, graduated Spring 2023; co-advised with Amitabha Bose
  - Thesis: Entrainment, bright light therapy, and depression

- Timothy Barnes, Physics, graduated Spring 2018
  Project: Effects of noise on closed-loop respiratory control

- Antonio Jurko, Applied Mathematics, graduated Spring 2016
  Project: Modeling locomotion in *C. elegans*

- Hamza Ahmad, Applied Mathematics, left program in 2015
  Project: Modeling locomotion in *C. elegans*

**Undergraduate students**

- Christopher Agesen, Mathematical Biology (2024). Project: Dynamical systems analysis in computational psychiatry. Supported by NSF GOALI.

- Kevin Yotongyos, Mathematical Sciences (2021). Project: SEIAQRV model of spread of COVID-19 with cGAN parameter estimation

- 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 Bendaoud, 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 (2024): Albright Owusu, Pharell Kenda. Project: Mathematical modeling and data analysis in computational psychiatry. Supported by NSF GOALI.

- Essex County College (2022): Franklyn Rodriguez Reyes, David Alonge, Chinonye Uzowuru. Project: Using deep hybrid modeling to identify biophysical mechanisms underlying circadian rhythms in cardiac arrhythmias. Supported by NSF CAREER.

- Essex County College (2021): David Alonge, Karolina Kowal, Francis Kanwaya-Nwajueboe, Chinonye Uzowuru. Project: Using deep hybrid modeling to determine treatment strategies for COVID-19 patients. Supported by NSF CAREER.

- 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 Foppossi, 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.

**High school students**

- Catherine Huggins (Summer 2024), Governor Livingston High School, Berkeley Heights, NJ. Project: Dynamical systems analysis in computational psychiatry

- Evan Fagan (Summer 2019), Columbia High School, Maplewood, NJ. Project: Circadian rhythms in cancer biology

- Fritz Huggins (Summer 2019/Summer 2021), Governor Livingston High School, Berkeley Heights, NJ. Projects: Circadian rhythms in cancer biology/Using deep hybrid modeling for neuronal dynamics

## PROFESSIONAL SERVICE

- SIAM Dynamical Systems Activity Group Officer Nominating Committee, 2025
- Officer (Secretary), SIAM Dynamical Systems Activity Group Officer, 2024-2025
- Editor-In-Chief, SIAM DSWeb (Dynamical Systems Web Magazine), 2024-2025
- SIAM Life Sciences Activity Group Awards Committee, 2017

**Workshop and Conference Organization**

- Co-organizer, Minisymposium on "Data Assimilation and Modeling of Cardiac Dynamics", SIAM NNP Section Annual Meeting, October 22, 2023. Newark, NJ
- Organizing Committee, Conference on "Frontiers in Applied and Computational Mathematics (FACM)", May 20-21, 2022. Newark, NJ
- 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.
- Organizing Committee, Conference on "Frontiers in Applied and Computational Mathematics (FACM)", June 3-4, 2016. Newark, NJ
- 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**

- NJIT CSLA Faculty Seed Grants, April 2021
- NSF Mathematical Biology Review Panel Member, March 2015, November 2022, June 2023
- Army Research Office Proposal Reviewer, February 2017.
- 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, Applied Sciences, SIAM Journal of Applied Dynamical Systems, Chaos: An Interdisciplinary Journal of Nonlinear Science, Frontiers in Physiology, Journal of Computational Neuroscience, Frontiers in Neuroscience, Nature Communications, iScience, Cell Reports, Physical Review Letters*

**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**

- Institute Sabbatical Committee, 2020-2023
- CSLA Faculty Seed Grant Reviewer, 2021
- 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, 2020-present
    - Mathematical Biology Seminar Organizer, 2014-2018
    - Faculty Search Committee, 2014-2015, 2017-2018, and 2018-2019
    - Postdoctoral Scholar Search Committee, 2017-2018
    - FACM Conference Organizing Committee, 2015-2016, 2016-2017, and 2021-2022
    - Curriculum Review Committee, 2022-

- Ohio State University, Mathematical Biosciences Institute
    - Colloquium Committee, 2011-2012

**Ph.D. Dissertation Committees**

- Prianka Bose, Department of Mathematical Sciences. "Learning Paradigms for Rhythm Detection and Generation using Mathematical Models, Biophysical and Artificial Neural Networks". Role: member. Dissertation Defense Date: December 3, 2024.
- Pyong Hwa Kim, Department of Chemistry and Environmental Science. "Reconstituting the Cyanobacterial Circadian Clock In Vitro". Role: member. Dissertation Defense Date: March 30, 2021.
- Manpreet Kaur, Department of Chemistry and Environmental Science. "Molecular Mechanism of Cyanobacterial Circadian Clock Oscillator and Effect of Co-factors on its Oscillation". Role: member. Dissertation Defense Date: March 15, 2020.
- 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.

**Master's Thesis Committees**

- Jung Hyun Park, Department of Mathematical Sciences. "Parameter estimation in a Biophysical Neuron Model: A Bayesian Approach". Role: member. Dissertation Defense Date: April 25, 2024

## PROFESSIONAL DEVELOPMENT ACTIVITIES

Institute for Teaching Effectiveness Workshops       2017
- January 10, 2018
- August 31, 2017
- May 18, 2017

NJIT New Faculty Development Series       2015
- Ten workshops throughout Fall 2015

STEM $C^2$ Research Summit (Bergen Community College)       2015
- April 17 – flipping the classroom

Teaching, Technology, and Learning Faculty Institute       2013
- August 26 -- facilitating student engagement and success
- August 20 -- Learning Management Systems (Moodle)

University Center for Advancement of Teaching (Ohio State University)    2012
- Observed my teaching and provided feedback mid-term

Completed course in Teaching Engineering (ENGIN 580)       2009
- Covered learning theories, teaching strategies, course preparation

Participated in INFORMS Future Academician Workshop       2009

- 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