

Krešimir Josić

Curriculum Vitae

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Education

- 1999 **Ph.D., Mathematics**, *Pennsylvania State University*, State College, PA.
Advisor: C.E. Wayne
- 1994 **B.Sc., Mathematics and B.Sc., Physics**, *University of Texas at Austin*, Austin, TX.
Summa cum laude and departmental honors

Professional Experience

- 2020–present **John and Rebecca Moores Professor of Mathematics**, *University of Houston*, Houston, TX.
With joint appointment in Biology and Biochemistry
- 2013–2020 **Professor of Mathematics**, *University of Houston*, Houston, TX.
With joint appointment in Biology and Biochemistry
- 2007–2013 **Associate Professor of Mathematics**, *University of Houston*, Houston, TX.
- 2002–2007 **Assistant Professor of Mathematics**, *University of Houston*, Houston, TX.
- 1999–2002 **Visiting Assistant Professor in Dynamical Systems**, *Boston University*, Boston, MA.
Department of Mathematics and Center for BioDynamics
- 1994–1999 **Graduate Assistant**, *Pennsylvania State University*, State College, PA.
Department of Mathematics

Adjunct Appointments and Affiliations

- 2025–present **Affiliate Member**, *National Institute for Theory and Mathematics in Biology*, Chicago, IL.
- 2015–present **Adjunct Professor**, *Rice University*, Houston, TX.
Department of BioSciences
- 2007–2022 **Adjunct Professor**, *University of Texas at Houston*, Houston, TX.
School of Public Health and Graduate School of Biological Sciences

Research Interests

- Primary Areas Mathematical Biology, Theoretical Neuroscience, Synthetic Biology, Dynamical Systems
- Methods Dynamical Systems Theory, Stochastic Processes, Network Theory, Computational Modeling, Bayesian Inference
- Applications Neural Networks, Decision Making, Microbial Consortia, Gene Regulatory Networks, Social Networks

Book

K. Josić, J. Rubin, M. Matías and R. Romo, eds. *Coherent Behavior in Neuronal Networks*. Springer Verlag (2009).

Publications Under Review

Note: Equal contributions are marked with a *. Publications in which authors are listed alphabetically are preceded with (*). Co-corresponding (senior) authorships are marked with **.

- 2026 **Q. Wang***, **G. J. Gutierrez***, **A. B. Kunin***, **J. T. Vogelstein**, **K. E. Bassler**, **K. Josić****, and **R. Betzel****, *A network neuroscience for nanoscale connectomics*, Submitted.
- 2026 **A.G. Chavez**, ..., **K. Josić**, **S. A. Sheth**, and **B. Y. Hayden**, *Mirror manifolds: partially overlapping neural subspaces for speaking and listening*, Submitted, <https://www.biorxiv.org/content/biorxiv/early/2025/09/20/2025.09.20.677504.full.pdf>.
- 2026 **C. Jarne**, **R.K. Yoon**, **T. Eissa**, **Z. Kilpatrick**, and **K. Josić**, *Task-Parametrized Dynamics: Representation of Time and Decisions in Recurrent Neural Networks*, Submitted, <https://www.biorxiv.org/content/10.1101/2025.09.15.676356v1>.
- 2025 **N. Sherf**, **X. Pitkow**, **K. Josić**, and **K. Bassler**, *From Chaos to Coherence: Effects of High-Order Synaptic Correlations on Neural Dynamics*, Submitted, <http://arxiv.org/abs/2504.00300>.

Refereed Publications

- 2026 **A. Gupta**, **R.K. Yoon**, and **K. Josić**, *Bayesian Inference of Gene Regulatory Networks at Stochastic Steady State*, To appear in *Journal of the Royal Society Interface*, <https://www.biorxiv.org/content/10.64898/2026.01.10.698684v1>.
- 2026 **I. Kalburge**, **A. Dallstream**, **K. Josić**, **Z.P. Kilpatrick**, **L. Ding**, and **J.I. Gold**, *Human decision-makers terminate evidence accumulation using flexible decision rules*, To appear in *eLife*, <https://doi.org/10.7554/eLife.111082.1>.
- 2026 **N. Sherf**, **S. Tang**, **D. Hafner**, **J.D. Touboul**, **X. Pitkow**, **K. Bassler**, and **K. Josić**, *Complexity and dynamics of partially symmetric random neural networks*, To appear in *Physical Review E*, <https://arxiv.org/pdf/2512.24439>.
- 2026 **H. Kim**, **Z.P. Kilpatrick****, and **K. Josić****, *Daring few, patient many: division of labor in decentralized foraging collectives*, *Proceedings of the National Academy of Sciences*, 123(26), e2605309123, <https://doi.org/10.1073/pnas.2605309123>.
- 2026 **N.W. Barendregt**, **J.I. Gold**, **K. Josić**, and **Z.P. Kilpatrick**, *Information-Seeking Decision Strategies Mitigate Risk in Dynamic, Uncertain Environments*, *Journal of the Royal Society Interface*, 23(237), 20251308, <https://arxiv.org/abs/2503.19107>.
- 2026 **M. Wang**, **L. González**, **S. Saha**, **K. Josić**, **A. Mugler****, and **M. R. Bennett****, *Fast, long-range intercellular signal propagation through growth-assisted positive feedback*, *Cell Systems*, 17(3), 101517, <https://doi.org/10.1016/j.cels.2025.101517>.
- 2026 **A. S. Kumar**, **K. Josić**, **C. T. Bauch**, and **M. Anand**, *From Opinion Polarization to Climate Action: A Social-Climate Model of the Opinion Spectrum*, *SIAM Journal on Applied Dynamical Systems*, 25(3), 1469–1495, <https://doi.org/10.1137/25M1759914>.
- 2025 **N. E. Grandel**, **A. M. Alexander**, **X. Peng**, **C. Palamountain**, **R. N. Alnahhas**, **A. J. Hirning**, **K. Josić****, and **M. R. Bennett****, *Long-term homeostasis in microbial consortia via auxotrophic cross-feeding*, *Nature Communications*, 16(1):8573, <https://www.biorxiv.org/content/10.1101/2025.01.08.631749v1>.
- 2025 **H. Jo**, **K. Josić****, and **J.K. Kim****, *Neural Network-Based Parameter Estimation for Non-Autonomous Differential Equations with Discontinuous Signals*, *SIAM Journal on Applied Mathematics* 86:1, pp. 327–347, <https://arxiv.org/abs/2507.06267>.
- 2025 **Z. Ding***, **P. G. Fahey***, **S. Papadopoulos***, et al., *Functional connectomics reveals general wiring rule in mouse visual cortex*, *Nature* 640:459-469, <https://www.biorxiv.org/content/10.1101/2023.03.13.531369v3>.
- 2025 **H. Kim**, **M. Subedi**, and **K. Josić**, *Emergence of multiple foraging strategies under competition*, *Mathematical Biosciences* 380:109377, <https://doi.org/10.1101/2024.04.19.590345>.

- 2024 **B. de Freitas Magalhães***, **G. Fan***, **E. Sontag**, **K. Josić****, and **M. R. Bennett****, *Pattern formation and bistability in a synthetic intercellular genetic toggle*, *ACS Synthetic Biology* **13**:9, <https://www.biorxiv.org/content/10.1101/2022.08.02.502488v1>.
- 2024 **S. Linn**, **S. D. Lawley**, **B. R. Karamched**, **Z. P. Kilpatrick**, and **K. Josić**, *Fast decisions reflect biases, slow decisions do not*, *Physical Review E*, **110**, 024305, <https://arxiv.org/pdf/2401.00306>.
- 2023 **D. M. Zong***, **M. Sadeghpour***, **R. N. Alnahhas**, **A. J. Hirning**, **S. Molinari**, **W. Ott**, **K. Josić****, and **M. R. Bennett****, *Tunable Dynamics in a Multistrain Transcriptional Pulse Generator*, *ACS Synthetic Biology* **12**:12, <https://www.biorxiv.org/content/10.1101/2022.09.23.509237v1>.
- 2023 **H. Hong**, **M. J. Cortez**, **H. J. Kim**, **B. Choi****, **K. Josić****, and **J. K. Kim****, *Inferring delays in partially observed gene regulatory networks*, *Bioinformatics* **39**:1, btad670, <https://doi.org/10.1093/bioinformatics/btad670>.
- 2023 **A. B. Kunin**, **J. Guo**, **K. Bassler**, **X. Pitkow**, and **K. Josić**, *Hierarchical Modular Structure of the Drosophila Connectome*, *Journal of Neuroscience* **43**:37, pp. 6384-6400, <https://www.biorxiv.org/content/10.1101/2022.11.23.517722v1>.
- 2023 **A. R. Andrei**, **A. E. Akil**, **N. Kharas**, **S. Pojoga**, **R. Rosenbaum**, **R. Janz**, **K. Josić**, and **V. Dragoi**, *Rapid compensatory plasticity revealed by dynamic correlated activity in vivo*, *Nature Neuroscience* **26**, pp. 1960-1969, <https://doi.org/10.1038/s41593-023-01446-w>.
- 2023 **W. Zhang**, **S. Wu**, **K. Josić****, and **B. Doiron****, *Sampling-based Bayesian inference in recurrent circuits of stochastic spiking neurons*, *Nature Communications* **14**: 7074, <https://doi.org/10.1038/s41467-023-41743-3>.
- 2023 **M. Stickler**, **W. Ott**, **Z. P. Kilpatrick****, **K. Josić****, and **B. Karamched****, *Impact of correlated information on pioneering decisions*, *Physical Review Research* **5**, 033020, <https://arxiv.org/abs/2304.01078>.
- 2023 **J. J. Winkle***, **S. Saha***, **J. Essman**, **M. R. Bennett****, **W. Ott****, **K. Josić****, and **A. Mugler****, *Signaling in microbial communities with open boundaries*, *Biophysical Journal* **122**:13, p. 2808, <https://www.biorxiv.org/content/10.1101/2023.01.20.524904v1>.
- 2023 **M. J. Cortez**, **A. E. Akil**, **K. Josić****, and **A.J. Stewart****, *Incorporating Computational Challenges into a Multidisciplinary Course on Stochastic Processes*, *SIAM Review* **65**:4, p. 1152, <https://arxiv.org/abs/2109.04431>.
- 2022 **N.W. Barendregt**, **K. Josić**, **J.I. Gold**, and **Z.P. Kilpatrick**, *Normative Decision Rules in Changing Environments*, *eLife*, <https://doi.org/10.7554/eLife.79824>.
- 2022 **T.L. Eissa**, **J.I. Gold****, **K. Josić****, and **Z.P. Kilpatrick****, *Suboptimal human inference can invert the bias-variance trade-off for decisions with asymmetric evidence*, *PLoS Computational Biology* **18**:7, <https://doi.org/10.1371/journal.pcbi.1010323>.
- 2022 **S. Sarmadi**, **J.J. Winkle**, **R.N. Alnahhas**, **M.R. Bennett**, **K. Josić**, **A. Mang**, and **R. Azencott**, *Stochastic Neural Networks for Automatic Cell Tracking in Microscopy Image Sequences of Bacterial Colonies*, *Mathematical and Computational Applications* **27**:2, p. 22, <https://www.mdpi.com/2297-8747/27/2/22>.
- 2022 **K. Schapiro**, **K. Josić**, **Z. Kilpatrick**, **J. Gold**, *Strategy-dependent effects of working-memory limitations on human perceptual decision-making*, *eLife*, <https://doi.org/10.7554/eLife.73610>.
- 2021 **M. J. Cortez**, **H. Hong**, **B. Choi****, **J. K. Kim****, and **K. Josić****, *Hierarchical Bayesian models for inference in biochemical reactions with delays*, *Bioinformatics* **38**:1, p. 187.
- 2021 **J.J. Winkle**, **B.R. Karamched**, **M.R. Bennett**, **W. Ott**, and **K. Josić**, *Emergent spatiotemporal population dynamics with cell-length control of synthetic microbial consortia*, *PLoS Computational Biology* **17**:9, e1009381.

- 2021 **A. E. Akil, R. Rosenbaum, and K. Josić**, *Balanced networks under spike-time dependent plasticity*, *PLoS Computational Biology* **17**(5): e1008958.
- 2020 **B. Karamched, M. Stickler, W. Ott, B. Lindner, Z. P. Kilpatrick, and K. Josić**, *Heterogeneity Improves Speed and Accuracy in Social Networks*, *Physical Review Letters* **125**:21, 218302.
- 2020 **B. Karamched*, S. Stolarczyk*, Z. Kilpatrick**, and K. Josić****, *Bayesian evidence accumulation on social networks*, *SIAM Journal on Applied Dynamical Systems* **19**:3, p. 1884.
- 2020 **R. N. Alnahhas, M. Sadeghpour, Y. Chen, A. A. Frey, W. Ott, K. Josić, and M. R. Bennett**, *Majority sensing in synthetic microbial consortia*, *Nature Communications* **11**, 3659.
- 2020 **Y. Wang, Z. Kilpatrick, and K. Josić**, *A hierarchical model of perceptual multistability involving interocular grouping*, *Journal of Computational Neuroscience* **48**, p. 177.
- 2020 **B. Choi, Y. Cheng, S. Cinar, W. Ott, M. R. Bennett, K. Josić*, and J.K. Kim***, *Bayesian inference of distributed time delay in transcriptional and translational regulation*, *Bioinformatics*, **36**:2, 1 p. 586.
- 2019 **A. E. Radillo, A. Veliz-Cuba, K. Josić*, Z. Kilpatrick***, *Performance of normative and approximate evidence accumulation on the dynamic clicks task*, *Neurons, Behavior, Data Analysis, and Theory*.
- 2019 **N. Barendregt, K. Josić*, Z. Kilpatrick***, *Analyzing dynamic decision-making models using Chapman-Kolmogorov equations*, *Journal of Computational Neuroscience*, **47**, p. 205.
- 2019 **R. N. Alnahhas, J. J. Winkle, A. J. Hirning, B. Karamched, W. Ott, K. Josić, M. R. Bennett**, *Spatiotemporal dynamics of synthetic microbial consortia in microfluidic devices*, *ACS Synthetic Biology* **8**:9, p. 2051.
- 2019 **Z. Kilpatrick, W. Holmes, T. Eissa, and K. Josić**, *Optimal models of decision-making in dynamic environments*, *Current Opinions in Neurobiology* **58**, pp. 54–60.
- 2019 **J. K. Kim*, Y. Chen*, A. J. Hirning, R. Alnahhas, K. Josić**, M. R. Bennett****, *Long-range temporal coordination of gene expression in spatially extended synthetic microbial consortia*, *Nature Chemical Biology* **15**, p. 1102.
- 2019 **B. R. Karamched, W. Ott, I. Timofeyev, R. Alnahhas, M.R. Bennett, and K. Josić**, *Moran model of spatial alignment in microbial colonies*, *Physica D* **395** p. 1.
- 2019 **K. Nguyen, K. Josić, and Z. Kilpatrick**, *Optimizing sequential decisions in the drift-diffusion model*, *Journal of Mathematical Psychology* **88** p. 32.
- 2018 **D. Zong, S. Cinar, D.L. Shis, K. Josić, W. Ott, M.R. Bennett**, *Predicting transcriptional output of synthetic multi-input promoters*, *ACS Synthetic Biology* **7**:8, p. 1834.
- 2018 **Y. Chen, J. Ho, D. Shis, C. Gupta, J. Long, D. S. Wagner, W. Ott, K. Josić*, M. Bennett***, *Tuning the dynamic range of bacterial promoters regulated by ligand-inducible transcription factors*, *Nature Communications* **9**:64.
- 2018 **S. Stolarczyk, M. Bhardwaj, K.E. Basler, W. J. Ma, K. Josić**, *Loss of information in feedforward social networks*, *Journal of Complex Networks* **6**:3, p. 448.
- 2017 **G. Ocker, Y. Hu, B. Doiron, R. Rosenbaum, K. Josić, M. Buice, E. Shea-Brown**, *From the statistics of connectivity to the statistics of spike times in neuronal networks*, *Current Opinion in Neurobiology* **46** p. 109.
- 2017 **Y. Cheng, A. Hirning, K. Josić, M. Bennett**, *The Timing of Transcriptional Regulation in Synthetic Gene Circuits*, *ACS Synthetic Biology*.
- 2017 **J. Winkle, O. Igoshin, M. Bennett, K. Josić*, W. Ott***, *Modeling mechanical interactions in growing populations of rod-shaped bacteria*, *Physical Biology* **14**:5, 055001.
- 2017 **G. Ocker, K. Josić, E. Shea-Brown, M. A. Buice**, *Linking structure and activity in nonlinear spiking networks*, *PLoS Computational Biol* **13**(6): e1005583.

- 2017 **M. Sadeghpour, A. Veliz-Cuba, G. Orosz, K. Josić*, M. Bennett***, *Bistability and oscillations in co-repressive synthetic microbial consortia*, *Quantitative Biology* **5**:1, p. 55.
- 2017 **A. Radillo, A. Veliz-Cuba, K. Josić*, Z. Kilpatrick***, *Evidence accumulation and change rate inference in dynamic environments*, *Neural Computation* **29**: 6, p.1561.
- 2017 **A. Jacot-Guillarmod, Y. Wang, C. Pedroza, H. Ogmen, Z. Kilpatrick*, K. Josić***, *Extending Levelt's Propositions to perceptual multistability involving interocular grouping*, *Vision Research* **133**, p. 37.
- 2016 **A. Veliz-Cuba, C. Gupta, M. R. Bennett, K. Josić*, W. Ott***, *Effects of cell cycle noise on excitable gene circuits*, *Physical Biology* **13**:6.
- 2016 **B. Doiron, A. Litwin-Kumar, R. Rosenbaum, G. Ocker, K. Josić**, *The mechanics of state dependent neural correlations*, *Nature Neuroscience* **19**, p. 383.
- 2016 **M. Bhardwaj, R. van den Berg, W. J. Ma*, K Josić***, *Do people take stimulus correlations into account in visual search?*, *PLoS One* **11**(3): e0149402.
- 2016 **A. Veliz-Cuba, Z. Kilpatrick*, and K. Josić***, *Stochastic Models of Evidence Accumulation in Changing Environments*, *SIAM Review* **58**(2), p. 264.
- 2015 **J.K. Kim, K. Josić*, M. R. Bennett***, *The relationship between stochastic and deterministic quasi-steady state approximations*, *BMC Systems Biology* **9**:87.
- 2015 **A. Veliz-Cuba, A. J. Hirning, A. A. Atanas, F. Hussain, F. Vancia, K. Josić*, M. R. Bennett***, *Sources of variability in a synthetic gene oscillator*, *PLoS Computational Biology* **11**:12, e1004674.
- 2015 **A. Veliz-Cuba, H. Shouval, K. Josić*, and Z. Kilpatrick***, *Networks that learn the precise timing of event sequences*, *Journal of Computational Neuroscience* **39**: 3, p. 235.
- 2015 **Y. Chen*, J. K. Kim*, A. J. Hirning, K. Josić, M. R. Bennett**, *Emergent genetic oscillations in a synthetic microbial consortium*, *Science* **349**(6251): 986.
- 2015 **T. D. Nguyen-Huu, C. Gupta, B. Ma, W. Ott, K. Josić, M. R. Bennett**, *Timing and variability of galactose metabolic gene activation depend on the rate of environmental change*, *PLoS Computational Biology* **11**:7, e1004399.
- 2015 **M. Bhardwaj, S. Carroll, W. Ma, K. Josić**, *Visual Decisions in the Presence of Measurement and Stimulus Correlations*, *Neural Computation* **27**(11): 2318–2353.
- 2015 **D. Yatsenko, K. Josić, A. Ecker, E. Froudarakis, R. J. Cotton, A. Tolias**, *Improved Estimation and Interpretation of Correlations in Neural Circuits*, *PLoS Computational Biology* **11**:3, e1004083.
- 2014 **A. Veliz-Cuba, A. Kumar, and K. Josić**, *Piecewise linear and Boolean models of chemical reaction networks*, *Bulletin of Mathematical Biology* **76**:2945–2984.
- 2014 **J. Trousdale, S. Carroll, F. Gabbiani, and K. Josić**, *Near optimal decoding from coupled neuronal subpopulations in the fly*, *Journal of Neuroscience* **34**(36):12206.
- 2014 **J.K. Kim, K. Josić*, and M. Bennett***, *The validity of quasi steady-state approximations in discrete stochastic simulations*, *Biophysical Journal* **107**:783.
- 2014 **C. Gupta, M. Lopez, R. Azencott, M. Bennett, K. Josić, and W. Ott**, *Modeling delay in genetic networks: From delay birth-death processes to delay stochastic differential equations*, *Journal of Chemical Physics*, **140**:204108.
- 2014 **J.K. Kim, Z. Kilpatrick, M. Bennett, and K. Josić**, *Molecular mechanisms that regulate the coupled period of the mammalian circadian clock*, *Biophysical Journal*, **106**: 9, p. 2071.
- 2014 **Y. Hu, J. Trousdale, K. Josić, and E. Shea-Brown**, *Local paths to global coherence: Cutting networks down to size*, *Physical Review E* **89**:032802.

- 2014 **F. Hussain, C. Gupta, A. J. Hirning, W. Ott, K. Matthews, K. Josić, and M. Bennet,** *Engineered temperature compensation in a synthetic genetic clock*, *Proceedings of the National Academy of Sciences* **111**(3): 972.
- 2014 **S. Carroll, K. Josić, and Z. Kilpatrick,** *Encoding certainty in bump attractors*, *Journal of Computational Neuroscience* **37**:29–48.
- 2013 **C. Gupta, M. Lopez, W. Ott, K. Josić*, and M. Bennett*,** *Transcriptional Delay Stabilizes Bistable Systems*, *Physical Review Letters* **111** 058104.
- 2013 **J. Trousdale. Y. Hu, E. Shea-Brown, and K. Josić,** *A generative spike train model with time-structured higher order correlations*, *Frontiers in Computational Neuroscience* **7**:84.
- 2013 **Y. Hu, J. Trousdale, K. Josić, and E. Shea-Brown,** *Motif Statistics and Spike Correlations in Neuronal Networks*, *Journal of Statistical Mechanics: Theory and Experiment*, P03012.
- 2012 **E. A. Pnevmatikakis, K. Kelleher, R. Chen, P. Saggau, K. Josić, and L. Paninski,** *Fast spatiotemporal smoothing of calcium measurements in dendritic trees*, *PLoS Computational Biology* **8**(6): e1002569.
- 2012 **A. Hazra, R. Rosenbaum, B. Bodmann, S. Kao, K. Josić, and J. Žiburkus,** *β -Adrenergic modulation of spontaneous spatiotemporal activity patterns and synchrony in hyperexcitable hippocampal circuits*, *Journal of Neurophysiology* **108**:2, 658-671.
- 2012 **J. Trousdale, Y. Hu, E. Shea-Brown, and K. Josić,** *Impact of network structure and cellular response on spike time correlations*, *PLoS Computational Biology* **8**(3): e1002408.
- 2012 **R. van den Berg, M. Vogel, K. Josić, and W. Ma,** *Optimal inference of sameness*, *PNAS*, **109**:8, 3178-3183.
- 2012 **R. Rosenbaum, F. Marpeau, J. Ma, A. Barua and K. Josić,** *Finite volume and asymptotic methods for stochastic neuron models with correlated inputs*, *Journal of Mathematical Biology* **65**:1, 1-34.
- 2011 **R. Rosenbaum and K. Josić,** *Membrane potential and spike train statistics depend distinctly on input statistics*, *Physical Review E* **84**:5, article 051902.
- 2011 **K. Josić, W. Ott, J. M. Lopez, L.-J. Shiau and M. Bennett,** *Stochastic delay accelerates signaling in gene networks*, *PLoS Computational Biology* **7**:11: e1002264.
- 2011 **Y. Wang, B. Iliescu, J. Ma, K. Josić and V. Dragoi,** *Adaptive changes in neuronal synchronization in macaque V4*, *Journal of Neuroscience* **31**:37, 13204-13213.
- 2011 **R. Rosenbaum, J. Trousdale and K. Josić,** *The effects of pooling on spike train correlations*, *Frontiers in Neuroscience* **5**:58.
- 2011 **A. Kumar and K. Josić,** *Reduced models of networks of coupled enzymatic reactions*, *Journal of Theoretical Biology* **278**:1, 87-106.
- 2011 **R. Rosenbaum and K. Josić,** *Mechanisms that modulate transfer of spiking correlations*, *Neural Computation* **23**:5, 1261-1305.
- 2010 **E. Elhaik, D. Graur, K. Josić and G. Landan,** *Identifying compositionally homogeneous and nonhomogeneous domains within the human genome using a novel segmentation algorithm*, *Nucleic Acids Research* **38**:15, e158.
- 2010 **R. Rosenbaum, J. Trousdale and K. Josić,** *Pooling and correlated neural activity*, *Frontiers in Computational Neuroscience* **4**:9.
- 2010 **D. Gutnisky and K. Josić,** *Generation of spatio-temporally correlated spike-trains and local-field potentials using a multivariate autoregressive process*, *Journal of Neurophysiology* **103**:5, 2912-2030.
- 2010 **E. Elhaik, D. Graur and K. Josić,** *Genome order index should not be used for defining compositional constraints in nucleotide sequences - a case study of the Z-curve*, *Biology Direct* **5**:10 (online).

- 2010 **E. Elhaik, D. Graur and K. Josić**, *Comparative testing of DNA segmentation algorithms using benchmark simulations*, *Molecular Biology and Evolution* **27**:5, 1015-1024.
- 2009 **M. Scott-Pandorf, D. P. O'Connor, C.S. Layne, K. Josić, and M. J. Kurz**, *Walking in Simulated Martian Gravity: Influence of the Portable Life Support System's Design on Dynamic Stability*, *Journal of Biomechanical Engineering* **131**:9, 091005.
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- 2009 **Y. Sun, B. Danila, K. Josić and K. E. Bassler**, *Improved community structure detection using a modified fine tuning strategy*, *Europhysics Letters* **86**, 28004.
- 2009 **K. Josić, E. Shea-Brown, B. Doiron, and J. de la Rocha**, *Stimulus-dependent correlations and population codes*, *Neural Computation* **21**:10, 2774–2804.
- 2009 **D. Nevozhay, R. Adams, K. Murphy, K. Josić and G. Balazsi**, *Negative autoregulation linearizes the dose response and suppresses the heterogeneity of gene expression*, *PNAS* **106**, 5123-5128.
- 2009 **D. Dingli, C. Offord, R. Myers, K-W. Peng, T. W. Carr, K. Josić, S. J. Russell and Ž Bajzer**, *Dynamics of Multiple Myeloma Tumor Therapy with a Recombinant Measles Virus*, *Cancer Gene Therapy* **16**, 873–882.
- 2009 **F. Marpeau, A. Barua and K. Josić**, *A finite volume method for stochastic integrate-and-fire models*, *Journal of Computational Neuroscience* **26** 445-57.
- 2008 (*) **K. Josić and R. Rosenbaum**, *Unstable Solutions of Nonautonomous Linear Differential Equations*, *SIAM Review* **50** 570–584.
- 2008 **K. Kelleher, V. Hajdik, K. Josić and C. Colbert**, *Learning by structural remodeling in a class of single cell models*, *Journal of Computational Neuroscience* **25**:2, 282–295.
- 2008 **Y. Timofeeva, S.J. Cox, S. Coombes and K. Josić**, *Democratization in a passive dendritic tree: an analytical investigation*, *Journal of Computational Neuroscience* **25**:2, 228–244.
- 2008 **E. Shea-Brown, K. Josić, B. Doiron, and J. de la Rocha**, *Universal properties of correlation transfer in integrate-and-fire neurons*, *Physical Review Letters* **100**, 108102.
- 2008 (*) **Ž. Bajzer, T. Carr, K. Josić, S.J. Russell, and D. Dingli**, *Modeling of cancer virotherapy with recombinant measles viruses*, *Journal of Theoretical Biology* **252**:1, 109–122.
- 2008 (*) **R.E.L. DeVille, A. Harkin, M. Holzer, K. Josić, and T. Kaper**, *Analysis of a Renormalization Group Method for Solving Perturbed Ordinary Differential Equations*, *Physica D* **237**: 8, 1029–1052.
- 2008 **E. Elhaik, D. Graur, and K. Josić**, *Genome order index should not be used for defining compositional constraints in nucleotide sequences*, *Computational Biology and Chemistry*, **32**, 147.
- 2007 **J. de la Rocha, B. Doiron, E. Shea-Brown, K. Josić, and A. Reyes**, *Correlation between neural spike trains increases with firing rate*, *Nature* **448**, 802–806.
- 2007 (*) **N. Barlas, K. Josić, S. Lapin and I. Timofeyev**, *Non-uniform decay of predictability and return of skill in stochastic oscillatory models*, *Physica D* **232**(2), 116–127.
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- 2007 **J. Rubin and K. Josić**, *The firing of an excitable neuron in the presence of stochastic trains of strong synaptic inputs*, *Neural Computation* **19**, 1251–1294.

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- 2006 **K. Josić and A. Török**, *Network architecture and spatiotemporally symmetric dynamics*, *Physica D* **224**(1–2), 52–68.
- 2006 **K. Parwani and K. Josić**, *Rotation sets for networks of circle maps*, *Chaos*. **16**(1), 015115.
- 2006 **D. Dingli, M.D. Cascino, K. Josić, S.J. Russell, and Ž. Bajzer**, *Mathematical modeling of cancer radiotherapy*, *Mathematical Biosciences* **199**(1), 55–78.
- 2006 (*) **M. Golubitsky, K. Josić, and E. Shea-Brown**, *Winding Numbers and Average Frequencies in Phase Oscillator Networks*, *Journal of Nonlinear Science* **16**(3) 201–231.
- 2005 **K. Josić and J. Rubin**, *Deriving information about architecture from activity patterns in coupled cell systems*, *SIAM Journal on Applied Dynamical Systems* **4**(1), 53–77.
- 2004 **K. Josić and S. Peleš**, *Synchronization in Networks of General, Weakly non-linear oscillators*, *Journal of Physics A: Mathematical and General* **37**(49), 11801–11818.
- 2004 **M.S. Baptista, S. Boccaletti, K. Josić, and I. Leyva**, *Irrational Phase Synchronization*, *Physical Review E* **69**, 056228.
- 2004 **K. Josić and E. Sander**, *The Structure of Synchronization Sets for Noninvertible Systems*, *Chaos* **14**(2), 249–262.
- 2004 (*) **R. L. Devaney, K. Josić, M. Moreno Rocha, P. Seal, Y. Shapiro, and A. T. Frumosu**, *Playing catchup with iterated exponentials*, *American Mathematical Monthly* **111**(8), 704–709.
- 2004 (*) **R.L. Devaney, K. Josić, and Y. Shapiro**, *Singular perturbations of quadratic maps*, *International Journal of Bifurcations and Chaos* **14**:1, 161–171.
- 2003 (*) **E. Barreto, K. Josić, C. Morales, E. Sander, and P. So**, *The geometry of chaos synchronization*, *Chaos*, **13**, 151–164.
- 2003 **K. Josić and M. Beck**, *A geometric theory of chaotic phase synchronization*, *Chaos* **13** 247–258.
- 2002 **P. So, E. Barreto, K. Josić, E. Sander, and S. J. Schiff**, *Limits on the experimental detection of nonlinear synchronization*, *Physical Review E*, **65** 046225.
- 2001 **K. Josić and D.J. Mar**, *Phase synchronization of chaotic systems with small phase diffusion*, *Physical Review E*, **64**, 056234–1–056234–10.
- 2001 (*) **R. Bhattacharjee, R. L. Devaney, R. E. L. Deville, K. Josić, and M. Moreno-Rocha**, *Accessible Points in the Julia Set of Stable Exponentials*, *Discrete and Continuous Dynamical Systems B*, **1**(3), 299–318.
- 2001 **K. Josić and R.W. Hall**, *The Mathematics of Musical Instruments*, *American Mathematical Monthly*, **108**(4), 347–357.
- 2000 **K. Josić**, *Synchronization of Chaotic Systems and Invariant Manifolds*, *Nonlinearity*, **13**(4), 1321–1336.
- 2000 **K. Josić and C.E. Wayne**, *Dynamics of a Ring of Diffusively Coupled Lorenz Oscillators*, *Journal of Statistical Physics*, **98**(1), 1 – 30.
- 2000 (*) **K. Josić and R.W. Hall**, *Planetary Motion and the Duality of Force Laws*, *SIAM Review*, **42**(1), 114 – 125.
- 1998 **K. Josić**, *Invariant manifolds and synchronization of coupled dynamical systems*, *Physical Review Letters*, **80**(14) 3053 – 3056.
- 1997 **K. Josić**, *Local Bifurcations in the Symmetric Model of Selection with Fertility Differences*, *Journal of Theoretical Biology*, **189**, 291–295.

Book Chapters and Other Publications

Publications in which authors appear in alphabetical order are marked with a (*). Refereed entries are marked with a (#).

- 2026 **M. Aldana, et al.**, *Modeling Social Systems: Transparency, Reproducibility, and Responsibility*, *SIAM News*, **59**(2), <https://arxiv.org/abs/2508.18542>.
- 2022 **K. Josić, and J.D. Cook**, *A Conversation with Mathematical Consultant John D. Cook*, *SIAM News*, **55**(5).
- 2007 (*) **Ž. Bajzer, D. Dingli, K. Josić, and T. Carr**, *Optimization of tumor virotherapy with recombinant measles viruses*, In *Optimization in Medicine and Biology*, Editors: Gino J. Lim and Eva K Lee.
- 2006 (#) **K. Josić, E. Shea-Brown, and J. Moehlis**, *Isochrons*, In *Scholarpedia: The Free, Peer-Reviewed Encyclopedia*.
- 2006 (#) **J. Moehlis, K. Josić, and E. Shea-Brown**, *Periodic Orbits*, In *Scholarpedia: The Free, Peer-Reviewed Encyclopedia*.
- 2005 (*) **M. Golubitsky, K. Josić, and L.J. Shiau**, *Bursting in Coupled Systems*, in *Bursting: The Genesis of Rhythm in the Nervous System*, edited by S. Coombes and P. Bressloff.
- 2001 (*) **Golubitsky, K. Josić, and T.J. Kaper**, *An Unfolding Theory Approach to Bursting in Fast-Slow Systems*, in *Global Analysis of Dynamical Systems*, dedicated to Floris Takens.

Book Reviews

Ten book reviews in *SIAM Review* including reviews of *Normal Forms and Unfoldings for Local Dynamical Systems* by James Murdock (2004), *Statistics Done Wrong* by Alex Reinhart (2015), *A Course in Networks and Markets* by Rafael Pass (2020), and *Reinforcement Learning* by Andrew Barto and Richard S. Sutton (2021).

with M. Buice: Featured review of *Probability Theory: The Logic of Science* by E. T. Jaynes. *SIAM Review* **68**(2), 459-462 (2026).

with E. Shea-Brown: Featured review of *Mathematics for Neuroscientists* by F. Gabbiani and S. Cox and *Mathematical Foundations of Neuroscience* by G. B. Ermentrout and D. Terman. *SIAM Review* **53**(3), 577-583 (2011).

Press Coverage (Selected)

- 2026 **CU Boulder Today**, *Can leaderless societies get stuff done? Ask the honeybees*, Lisa Marshall. [Link](#)
- 2024 **New Scientist**, *Speed of decision-making reflects our biases*, Karmela Padavic-Callaghan. [Link](#)
- 2024 **ScienceDaily**, *Those with the biggest biases choose first, according to new math study*, [Link](#).
- 2021 **UH College of NSM News**, *Mathematics Professor Teaming Up with Biologists to Model Bacterial Divisions*, [Link](#).
- 2020 **Physics Today**, *Diverse groups make better decisions*, Heather M Hill, [Link](#).
- 2020 **Physics**, *How laggards help decision-making*, Richard A Blythe, [Link](#).
- 2019 **ScienceDaily**, *Synthetic cells make long-distance calls*, [Link](#).
- 2018 **ScienceDaily**, *Models give synthetic biologists a head start*, [Link](#).
- 2017 **University of Houston News**, *Decoding a Treasure Trove of Data from the Brain*, [Link](#).
- 2014 **ScienceDaily**, *Synthetic genetic clock keeps accurate time across a range of temperatures*, [Link](#).

Honors and Awards

- 2026 **University of Houston Excellence in Research and Scholarship Award**, *at the level of Full Professor.*
- 2020–present **John and Rebecca Moores Professor of Mathematics, Biology and Biochemistry**, *University of Houston.*
- 2022–2025 **Chair of the editorial committee**, *for the Proceedings of the AMS Symposia in Applied Mathematics.*
- 2021–2023 **Chair**, *SIAM Activity Group on Life Sciences.*
- 2015–16 **Simons Foundation fellowship.**
- 2012 **University of Houston Excellence in Research and Scholarship Award**, *at the level of Associate Professor.*
- 2009 **Bellman Prize**, *for best article in the journal Mathematical Biosciences between 2006 and 2008.*
- 1999 **Pritchard Dissertation Fellowship**, *Pennsylvania State University.*
- 1999 **ZZRQ Award for Outstanding Achievement by a Doctoral Candidate**, *Pennsylvania State University.*
- 1994–1996 **Curry Fellow**, *Pennsylvania State University.*

Editorial Work

- 2025–present **Editorial board**, *Journal of the Royal Society Interface.*
- 2025–present **Editorial board**, *Nonlinearity.*
- 2024–present **Editorial board**, *Mathematical Biosciences.*
- 2017–present **Editorial board**, *SIAM Journal on Applied Dynamical Systems.*
- 2014–present **Editorial board**, *SIAM Review.*
- 2011–2021 **Editorial board**, *Physica D.*

Grants Awarded

- 2025–2028 **NASA**, *\$182,000*, A Synthetic Bacterial System for Examining Multicellularity, with PI: M. Bennett (Rice).
- 2025–2029 **NSF**, *\$100,000*, EFRI BEGIN OI: Engineered Bacterial Consortia for Parallel Biocomputing, with PI: M. Bennett (Rice), and 3 other co-PIs.
- 2025–2028 **NSF**, *\$160,000*, Collaborative Research: DMS/NIGMS2: Spatiotemporal dynamics of intercellular signaling in growing cellular populations, multi-PI with: M. Bennett (Rice).
- 2024–2026 **NSF-Simons NITMB Subaward**, *\$150,000*, Impact of higher order structure on the dynamics of neural networks, with co-PIs: K. Bassler (UH) and X. Pitkow (CMU).
- 2021–2025 **NIH**, *\$400,000*, Dynamics and pattern formation in differentiating cellular populations, with PI: M. Bennett (Rice), and co-PI: O. Igoshin (Rice).
- 2023–2025 **NIH**, *\$56,850*, Anatomical connectivity and activity in primary visual cortex of mice, with PI: Andreas Tolias (BCM).
- 2021–2025 **NSF CRCNS**, *\$240,970*, Adaptive decision rules in dynamic environments, with PI: J. Gold (U. Penn), co-PI: Z. Kilpatrick (CU, Boulder).
- 2017–2024 **NSF NeuroNex Theory**, *\$4,393,191*, Inferring interactions between neurons, stimuli, and behavior, with co-PIs: A. Patel, X. Pitkow (BCM), G. Allen (Rice), and R. Rosenbaum (Notre Dame).
- 2019–2022 **NSF MODULUS**, *\$395,447*, Design and analysis of biochemical signaling in synthetic microbial populations, multi-PI with: M. Bennett (Rice), and A. Mugler (Pitt).

- 2017–2022 **NIH CRCNS**, \$460,000, Decision Making in Changing Environments, with PI: J. Gold (U Penn), co-PI: Z. Kilpatrick (CU, Boulder).
- 2017–2022 **NSF**, \$300,324, Spatiotemporal Dynamics of Synthetic Microbial Consortia, with PI: M. Bennett (Rice).
- 2016–2020 **NIH**, \$1,250,000, Expanding the utility of transcriptional bacterial computing, with PI: M. Bennett (Rice), co-PI L. Swing-Kruse (U Kansas), and co-I: Will Ott (UH).
- 2015–2018 **NSF**, \$329,445, The Ever-Changing Network: How Changes in Architecture Shape Neural Computations.
- 2015–2016 **Simons Foundation Fellowship**, \$79,840, Funding for sabbatical.
- 2014–2016 **Postdoc Supplement to NIH grant**, \$185,695, Mentors: K. Josić and M. Bennett (Rice).
- 2012–2017 **NIH**, \$1,150,000, Experimental and mathematical analysis of delay in transcriptional signaling, with PI: M. Bennett (Rice), and co-I: Will Ott (UH).
- 2011–2014 **NSF**, \$134,000, Relating architecture, dynamics and temporal correlations in networks of spiking neurons, with B. Doiron (Pitt) and E. Shea-Brown (U.W., Seattle).
- 2010–2012 **John S. Dunn Foundation**, \$30,000, Single cell dynamics of the white/opaque epigenetic switch in *Candida albicans*, with M Bennet and M Gustin.
- 2010–2012 **ARP/ATP**, \$88,600, Coherent behavior and coding in neuronal networks, with V. Dragoi (UT, Houston).
- 2008–2011 **NSF**, \$151,134, Correlations in neural dynamics and coding, with B. Doiron (Pitt) and E. Shea-Brown (U.W., Seattle).
- 2008–2011 **NSF**, \$214,019, REU Site for Theoretical and Computational Neuroscience.
- 2008–2010 **ARP/ATP**, \$148,000, Dynamics and Function of Feed Forward Networks, PI: Josić (50%), Co-PI: M. Golubitsky (50%).
- 2007–2012 **NIH–NIBIB**, \$727,000, Training in Theoretical and Computational Neuroscience, GCC for Theoretical and Computational Neuroscience.
- 2006–2009 **NSF**, \$420,000, Applications of Coupled Cell Systems, PI: Golubitsky (50%), Co-PI: Josić (50%).
- 2008–2009 **REU Supplement to NSF grant**, \$44,000, M. Golubitsky, K. Josić and M. Tomforde.
- 2006–2008 **ARP/ATP**, \$79,000, Theory and Applications of Coupled Systems, PI: Golubitsky (50%), Co-PI: Josić (50%).
- 2004–2007 **NSF CMG Collaborative Research**, \$422,964, Predictability and Dynamics of Models of Quasigeostrophic Turbulence and Their Low-Dimensional Truncations, PI: Glowinski (34%), with Co-PIs: Josić (33%) and Timofeyev (33%).
- 2003–2005 **NSF REU Program**, \$100,000, REU Program in Mathematical Biology, PI: S. Canic.
- 2003–2006 **NSF Focused Research Group**, \$960,758, Synchrony and Structure in Coupled Cell Systems, 2005–2006 PI: Josić (25%), Co-PIs: Golubitsky (25%), Field (25%), and Torok (25%); 2003–2005 PI: Golubitsky (25%), Co-PIs: Field (25%), Josić (25%) and Torok (25%).

Internal Grants and Conference Support

- 2013–2014 **UH GEAR Grant**, \$29,500, How do living organisms see the future?, PI: Josić and Kilpatrick.
- 2005–2006 **UH GEAR Grant**, \$20,562, The Structure and Dynamics of Networks, PI: Josić.
- 2009 **UH Quality Enhancement Program**, \$19,954, Mathematical Biology, PI: Josić, Co-PIs: R. Azevedo, K. Bassler, B. Bodmann, T. Cooper, C. Peters.
- 2007 **NSF**, \$14,410, International Workshop on Coherent behavior in neuronal networks, PI: Josić (50%), Co-PI: J. Rubin (U. Pittsburgh) (50%), Additional funding by ONR, Spanish and EU governments (~ \$18,000).

Students and Postdocs Supervised

Current Ph.D. Students

- 2025–present **Youval Jayasinghe**, *Ph.D. candidate*, Expected completion date 2029.
2024–present **Vera Schroeder**, *Ph.D. candidate*, Expected completion date 2027.
2023–present **Anshi Gupta**, *Ph.D. candidate*, Expected completion date 2027.
2023–present **Parnian Ahmadzadeh**, *Ph.D. candidate*, Expected completion date 2026.

Ph.D. Graduates (16 total)

- 2023 **Manoj Subedi**, *Ph.D.*, *Population Dynamics and Evolution of Phenotypic Attributes During Multi-Agent Foraging*.
2022 **Megan Stickler**, *Ph.D.*, *Decision Making in Multi-Agent Groups*.
2022 **Jayson Cortez**, *Ph.D.*, *Hierarchical Bayesian Inference of Stochastic Biochemical Processes*.
2021 **Alan Akil**, *Ph.D.*, *The Dynamics of Balanced Neural Networks Under Spike-Timing Dependent Plasticity*.
2020 **Kate Nguyen**, *Ph.D.*, *How Trial Correlations and Feedback Shape Sequential Decision-Making*.
2019 **Selahittin Cinar**, *Ph.D.*, *Inference Methods for Synthetic Gene Regulatory Networks*.
2018 **James Winkle**, *Ph.D.*, *Mechanical Constraint and Cell Shape Interaction Modeling of Bacterial Growth in Microfluidic Devices*.
2018 **Adrian Radillo**, *Ph.D.*, *Optimal Decision Making Models in Changing Environments*.
2017 **Simon Stolarczyk**, *Ph.D.*, *Decision making in social networks*.
2017 **Changan Liu**, *Ph.D.*, *The impact of STDP and correlated activity on network structure*.
2014 **Manuel Lopez**, *Ph.D.*, *Impact of stochastic transcriptional delay on gene networks*.
2013 **Manisha Bhardwaj**, *Ph.D.*, *Visual decision making in the presence of stimulus and measurement correlations*.
2013 **James Trousdale**, *Ph.D.*, *The interplay of architecture and correlated variability in neuronal networks*.
2011 **Robert Rosenbaum**, *Ph.D.*, *The propagation and transfer of correlated neural activity*.
2011 **Ajit Kumar**, *Ph.D.*, *Reduced models of networks of coupled enzymatic reactions*.
2010 **Keith Kelleher**, *Ph.D. (Biology, with P. Saggau)*, *Spatio-temporal information processing in single neurons*.

Current Postdocs

- 2022–present **Nimrod Sherf**, *with Xaq Pitkow and Kevin Bassler*, Postdoctoral Fellow.

Former Postdocs (with first position held)

- 2022–2026 **Amanda Alexander**, *with Matt Bennett*, Assistant Professor at Colgate University.
2022–2025 **RK Yoon**, *with Xaq Pitkow*, Assistant Professor at Wabash College.
2019–2024 **Tahra Eissa**, *with Zack Kilpatrick*, Assistant Professor at University of Colorado.
2020–2023 **Bridget Fan**, *with Matt Bennett*, Altos Labs.
2023–2024 **Hyunjoong Kim**, Assistant Professor at University of Cincinnati.
2019–2021 **James Winkle**, Instructor at the University of Houston.
2019–2022 **Alex Kunin**, *with Xaq Pitkow*, Assistant Professor at Creighton University.
2017–2020 **Bhargav Karamched**, *with Matt Bennett*, Assistant Professor at Florida State University.
2018–2020 **Mehdi Sadeghpour**, *with Matt Bennett*, Quantitative Analyst at Citigroup.
2013–2015 **Alan Veliz-Cuba**, *with Matt Bennett*, Now Associate Professor at Dayton University.
2013–2015 **Jae-Kyoung Kim**, *with Matt Bennett*, Now Associate Professor at KAIST and IBS, S. Korea.
2012–2015 **Chinmaya Gupta**, *with Matt Bennett*, Allstate.

- 2009–2011 **Fabien Marpeau**, *Seismic Imaging Project Leader at CGG.*
 2009–2011 **Jiainfu Ma**, *Principal Engineer at Haliburton.*
 2005–2006 **Kamlesh Parwani**, Associate Professor at Eastern Illinois University.
 2004–2006 **Sergey Lapin**, Professor at Washington State University.

Recent Courses Taught

- Spring 2026 **Applied Graph Theory**, 19 students.
 Fall 2025 **Computational Neuroscience**, *Graduate level*, 8 students.
 Spring 2025 **Mathematics of Machine and Reinforcement Learning**, *Graduate level*, 16 students.
 Fall 2024 **Applied Graph Theory**, 24 students.
 Spring 2024 **Transitions to Advanced Mathematics**, 22 students.
 Fall 2023 **Introduction to Computational Neuroscience**, *Graduate level*, 13 students.
 Spring 2023 **Applied Graph Theory**, 32 students.
 Fall 2022 **Topics in Machine and Statistical Learning**, *Graduate level*, 14 students.
 Spring 2022 **Applied Graph Theory**, 41 students.
 Fall 2021 **Introduction to Stochastic Processes**, 39 students.
 Spring 2021 **Topics in Machine and Statistical Learning**, *Graduate level*, 17 students.
 Fall 2020 **Stochastic Processes in Biology**, *Graduate level*, 16 students.
 Spring 2020 **Applied Graph Theory**, 50 students.
 Fall 2020 **Statistics for the Sciences**, 60 students.

Service and Leadership

- 2014–2021 **Chair**, *Gulf Coast Consortium for Theoretical and Computational Neuroscience.*
 2021–2023 **Chair**, *SIAM Activity Group on Life Sciences.*
 2022–2025 **Chair**, *Editorial committee for the Proceedings of the AMS Symposia in Applied Mathematics.*

Conference and Workshop Organization (Selected)

- July 2027 **Co-organizer**, *Workshop on Mathematical Approaches at the Interface of Machine Learning and Synthetic Biology, BIRS, Banff, Canada.*
 July 2026 **Co-organizer**, *Minisymposium on Mathematical Principles of Decentralized Collective Decisions, SIAM Conference on the Life Sciences, Cleveland, OH.*
 June 2026 **Co-organizer**, *Workshop on extreme events in biology, NITMB, Chicago, US.*
 June 2025 **Co-organizer**, *Minisymposium on stochastic neural dynamics, SIAM Midwest Regional meeting, Fayetteville, AK.*
 June 2025 **Co-organizer**, *Workshop on social decisions, BIRS station at Oaxaca, Mexico.*
 May 2025 **Co-organizer**, *Workshop on Stochastic Modeling, SIADS, Denver.*
 August 2023 **Co-organizer**, *Workshop on Stochastic Modeling and Data Analysis in Biology.*
 October 2019 **Co-organizer**, *Workshop on Modeling Social Decisions, University of Houston, TX.*
 September 2019 **Co-organizer**, *NeuroNex Junior Scientists Workshop, Columbia University, NY.*
 July 2019 **Organization Committee**, *ICMNS, Copenhagen, Denmark.*
 July 2018 **Co-organizer**, *Workshop on “Emergent Behavior in Biological Systems”, BIRS, Banff, Canada.*
 December 2015 **Co-organizer**, *Workshop on “Theoretical Neuroscience”, BIRS, Banff, Canada.*
 October 2010 **Co-organizer**, *Workshop on “Network Dynamics and Coding”, BIRS, Banff, Canada.*

October 2007 **Organizer**, Conference “Coherent Behavior in Neuronal Networks”.

Invited Lectures and Presentations at Conferences

- 2025 **SIAM Midwest Regional Meeting**, *University of Arkansas, Fayetteville.*
- 2025 **Workshop on Social Phenomena**, *Casa Matematica, Oaxaca, Mexico.*
- 2025 **Biologically Physics and Physical Biology**, *Online.*
- 2024 **International Workshop on Mathematical Biology**, *Boracay, Philippines.*
- 2023 **Mathematical Challenges in Neuronal Network Dynamics**, *ICERM, Providence RI.*
- 2023 **International Congress on Applied and Industrial Mathematics**, *Tokyo, Japan.*
- 2023 **Stochastic Modeling and Data Analysis in Biology**, *Daejeon, S. Korea.*
- 2023 **Dynamical Systems in the Life Sciences**, *Columbus, OH.*
- 2023 **SIAM Dynamical Systems**, *Portland, OR.*
- 2023 **Oberwolfach Workshop on Mathematics in Biology**, *Oberwolfach, Germany.*
- 2022 **SIAM Texas–Louisiana Meeting**, *Houston, TX.*
- 2022 **Biomedical Mathematics Online Colloquium**, *S. Korea.*
- 2021 **Address to the Croatian Academy of Arts and Sciences.**
- 2021 **7th International Conference on Mathematical NeuroScience (ICMNS)**, *Plenary Lecture.*
- 2019 **Workshop on Dynamics, Randomness, and Control in Molecular and Cellular Networks**, *Harvard University, Cambridge, MA.*
- 2019 **Workshop on Social Decisions**, *Houston, TX.*
- 2019 **q-Bio Summer School**, *Rice University, Houston, TX.*
- 2019 **5th International Conference on Mathematical NeuroScience (ICMNS)**, *Denmark.*
- 2019 **SIAM Dynamical Systems**, *Snowbird, CO.*
- 2018 **NeuroNex PI Meeting**, *San Diego, CA.*
- 2016 **IEEE Workshop on Complex Systems and Networks**, *Atlanta, GA.*
- 2016 **Analysis of PDEs using Dynamical Systems Techniques**, *Boston, MA.*
- 2016 **SIAM Conference on Life Sciences**, *Boston, MA.*
- 2016 **MBI Workshop on Interplay of Deterministic and Stochastic Dynamics in Networks.**
- 2015 **Mathematical Models in Medicine**, *Rijeka, Croatia.*
- 2014 **SIAM Life Sciences**, *Charlotte, NC.*
- 2014 **Conference in honor of Jack Cowan**, *Banff, CA.*
- 2013 **MBI Workshop for Young Researchers in Math Bio**, *Columbus, OH*, Plenary Speaker.
- 2013 **MBI Workshop on Sensory Systems and Coding**, *Columbus, OH.*
- 2013 **Computational and Theoretical Biology Symposium**, *Houston, TX.*
- 2012 **Dynamical systems on random graphs**, *Castro Urdiales, Spain*, Plenary Speaker.
- 2012 **Mathematical Physics of Complex Networks**, *Max Planck Institute, Dresden, Germany.*
- 2011 **Meanfield methods in Theoretical Neuroscience**, *CIRM, Marseille.*
- 2011 **2011 National IRACDA Conference**, *Houston, TX.*
- 2011 **Keck Seminar**, *Houston, TX.*
- 2011 **AMS Annual Meeting**, *New Orleans, LA.*
- 2010 **SIAM Life Sciences**, *Pittsburgh, PA.*
- 2009 **SIAM Annual Meeting**, *Denver, CO.*
- 2009 **FACM – 2009**, *NJIT, Newark, NJ.*
- 2009 **SIAM Dynamical Systems**, *Snowbird, CO.*

- 2008 **SIAM Life Sciences**, *Montreal, Canada.*
- 2008 **SIAM Annual Meeting**, *San Diego, CA.*
- 2008 **AMS regional meeting**, *Baton Rouge, LA.*
- 2007 **SIAM Dynamical Systems**, *Snowbird, CO.*
- 2007 **Dynamics Days**, *Boston, MA.*
- 2006 **Theoretical Neuroscience Network**, *Bristol, UK.*
- 2006 **Neuromath**, *San Julia de Lorria, Andorra.*
- 2006 **SIAM Life Sciences**, *Raleigh, NC.*
- 2006 **International Workshop on the Dynamics on Complex Networks**, *Dresden, Germany.*
- 2005 **Theory and Application of Coupled Cell Networks**, *Cambridge, UK.*
- 2005 **SIAM Conference on Applications of Dynamical Systems**, *Snowbird, CO.*
- 2005 **Workshop on Mathematical Neuroscience**, *Edinburgh, Scotland.*
- 2005 **Houston Society for Engineering in Biology and Medicine Annual Meeting**, *Houston, TX.*
- 2005 **Coupled 60 Workshop**, *Houston, TX.*
- 2004 **5th International Conference on Dynamical Systems and Diff. Equations**, *Pomona, CA.*
- 2004 **6th Joint Meeting of the AMS and SMM**, *Houston, TX.*
- 2004 **2nd Texas Dynamical Systems Workshop**, *Houston, TX.*
- 2003 **5th International Congress on Industrial and Applied Mathematics**, *Sydney, Australia.*
- 2003 **SIAM Conference on Applications of Dynamical Systems**, *Snowbird, CO.*
- 2002 **AMS Sectional Meeting 982**, *Orlando, FL.*
- 2002 **SIAM Conference on Life Sciences**, *Boston, MA*, Minisymposium organizer and speaker.
- 2002 **Dynamics Days 2002**, *Baltimore, MD*, Poster presentation.
- 2002 **4th International Conference on Dynamical Systems and Diff. Equations**, *Willmington, NC.*
- 2001 **Workshop on the Control and Synchronization of Dynamical Systems**, *Max Planck Institute, Dresden, Germany.*
- 2001 **SIAM Conference on Applications of Dynamical Systems**, *Snowbird, CO.*
- 2001 **Gordon Conference on Nonlinear Science**, *Mount Holyoke College, South Hadley, MA*, Discussion leader.
- 2001 **Semi-annual Workshop on Dynamical Systems and Related Topics**, *University of Maryland, College Park, MD.*
- 2000 **Pacific Rim Dynamical Systems Conference**, *Maui, Hawaii*, Minisymposium organizer and speaker.
- 2000 **Symposium on the Synchronization of Chaotic Systems**, *The Abdus Salam ICTP, Trieste, Italy.*
- 2000 **Nonlinear Science 2000**→, *Courant Institute, New York, NY*, Poster presentation.
- 2000 **Complex Synchrony in Neuroscience**, *Krasnow Institute for Advanced Study, GMU, Fairfax, VA.*
- 2000 **953rd AMS meeting, Session on Applications of Invariant manifolds**, *University of Notre Dame, Notre Dame, IN.*
- 1999 **SIAM Conference on Applications of Dynamical Systems**, *Snowbird, CO.*
- 1998 **Midwest Dynamical Systems Conference**, *Northwestern University, Evanston, IL.*
- 1997 **Semi-annual Workshop on Dynamical Systems and Related Topics**, *Pennsylvania State University, State College, PA.*

1997 **Annual Meeting of the Society for Mathematical Biology**, *University of North Carolina, Chapel Hill, NC.*

Invited Lectures at Universities and Colleges

2025 **University of Waterloo**, *Applied Mathematics Colloquium.*
2025 **Bernstein Center**, *Berlin, Germany.*
2025 **Virginia Tech**, *Mathematics Colloquium.*
2024 **Seminario MatBio, UTEM**, *Chile (online).*
2024 **University of Pittsburgh**, *Colloquium.*
2024 **University of the Philippines at Diliman**, *World Expert Lecture.*
2023 **University of Utah**, *Mathematical Biology Seminar.*
2023 **University of Texas at Austin**, *Neuroscience Seminar.*
2023 **Texas Southern University**, *Applied Mathematics Seminar.*
2023 **Rice University**, *CTBP Seminar.*
2022 **University of Pennsylvania**, *Mathematical Biology Seminar.*
2022 **University of South Florida**, *Mathematics and Statistics Seminar.*
2022 **Georgia Tech**, *Mathematical Biology Seminar.*
2021 **University of Chicago**, *Neuroscience and Applied Math Seminars.*
2020 **Brandeis University**, *Mathematical Biology Seminar (online).*
2019 **Northwestern University**, *Applied Mathematics Colloquium.*
2019 **University of Texas at Austin**, *Random Media Seminar.*
2018 **NYU**, *Mechanical Engineering.*
2018 **Notre Dame**, *Applied Math Colloquium.*
2018 **CU, Boulder**, *Applied Math Colloquium.*
2017 **KAIST, Republic of Korea**, *2 lectures.*
2017 **New Jersey Institute of Technology**, *Mathematics Colloquium.*
2015 **University of Texas at San Antonio**, *Neuroscience Seminar.*
2014 **University of California, Santa Barbara**, *CCDC Seminar.*
2014 **Georgia State University**, *Mathematics Colloquium.*
2013 **IUPUI, Indianapolis**, *Colloquium.*
2013 **University of Illinois, Urbana-Champaign**, *Applied Math Seminar.*
2013 **Columbia University**, *Center for Theoretical Neuroscience.*
2013 **Case Western Reserve**, *Mathematical Biology Seminar.*
2012 **University of Arizona**, *Applied Mathematics Colloquium.*
2012 **University of Pittsburgh**, *Mathematical Biology Seminar.*
2012 **Rice University**, *CAAM Colloquium.*
2010 **University of Texas Medical School at Houston.**
2010 **University of Texas, Austin**, *Center for Perceptual Systems.*
2009 **Columbia University**, *Center for Theoretical Neuroscience.*
2009 **Trinity University**, *Majors' Seminar.*
2009 **Brown University**, *Dynamical Systems Seminar.*
2008 **University of Oklahoma**, *Colloquium and Undergraduate Seminar.*
2006 **Baylor College of Medicine**, *Neuroscience Seminar.*
2005 **University of Texas, School of Public Health**, *Biostats Colloquium.*

- 2005 **Southern Methodist University**, *Department of Mathematics Colloquium.*
- 2005 **Trinity University**, *Department of Mathematics Colloquium.*
- 2004 **New York University**, *Computational Neuroscience Seminar.*
- 2004 **University of Texas at Arlington**, *Applied Mathematics Seminar.*
- 2004 **Georgia Institute of Technology**, *Center for Nonlinear Science Colloquium.*
- 2003 **University of Texas at San Antonio**, *Mathematics Colloquium.*
- 2003 **Rice University**, *Mathematics Colloquium.*
- 2003 **College of the Holy Cross**, *Colloquium.*
- 2003 **Worcester Polytechnic Institute**, *Colloquium.*
- 2003 **Georgia Institute of Technology**, *Nonlinear Dynamics Seminar.*
- 2002 **University of Texas at Austin**, *Dynamical Systems Seminar.*
- 2002 **Boston University**, *Dynamical Systems Seminar.*
- 2002 **Georgetown University**, *Department of Mathematics.*
- 2002 **University of Houston**, *Department of Mathematics.*
- 2002 **University of Texas at Austin**, *Mathematical Physics Seminar.*
- 2001 **Tufts University**, *Department of Mathematics Colloquium.*
- 2001 **Boston University Academy**, *Masterclass (talented high school students).*
- 2001 **Rensselaer Polytechnic Institute**, *Department of Mathematics Colloquium.*
- 2000 **SUNY, Stony Brook**, *Dynamical Systems Seminar.*
- 2000 **Universitat Autònoma de Barcelona**, *Department of Mathematics Colloquium.*
- 2000 **University of Houston**, *Nonlinear Dynamics Seminar.*
- 2000 **New Jersey Institute of Technology**, *Department of Applied Mathematics Colloquium.*
- 2000 **Institute for Physical Sciences Seminar**, *University of Maryland.*
- 2000 **George Mason University**, *Department of Physics Colloquium.*
- 1999 **Dartmouth College**, *Department of Mathematics Colloquium.*
- 1999 **Trinity College**, *Department of Mathematics Colloquium.*
- 1999 **George Mason University**, *Department of Mathematics Colloquium.*
- 1998 **Boston University**, *Center for BioDynamics Seminar.*
- 1998, 2000 **Boston University**, *Dynamical Systems Seminar.*
- 1996 **Pennsylvania State University**, *Dynamical Systems Seminar.*

--- Outreach Activities

- 2009–present **Contributor**, *“Engines of Our Ingenuity”*, Selected episodes out of about 50 contributions, <http://www.uh.edu/engines/>.
 - Episode 2487: “Von Neumann, Computers, and Brains” - <https://engines.egr.uh.edu/episode/2487>
 - Episode 2502: “Computer Proofs” - <https://engines.egr.uh.edu/episode/2502>
 - Episode 2514: “Linear Algebra and Netflix” - <https://engines.egr.uh.edu/episode/2514>
 - Episode 2719: “The Mathematics of Language” - <https://engines.egr.uh.edu/episode/2719>
 - Episode 2862: “Randomness” - <https://engines.egr.uh.edu/episode/2862>
 - Episode 3050: “Space Travel” - <https://engines.egr.uh.edu/episode/3050>
 - Episode 3071: “The Unreasonable Effectiveness of Mathematics” - <https://engines.egr.uh.edu/episode/3071>
 - Episode 3109: “Aumann’s Theorem” - <https://engines.egr.uh.edu/episode/3109>
- Spring 2008 **Seminar leader**, *Houston Teachers Institute (HTI)*, <http://hti.math.uh.edu/>.

Course and Program Development

Program Development	Lead the development of the program leading to a degree in Mathematical Biology offered jointly by the Departments of Mathematics and Biology and Biochemistry.
Undergraduate Courses	Participated in the development of three new undergraduate courses: Biostatistics, Mathematics of Evolution, and Mathematical Biology that are offered as part of the degree.
Graduate Courses	Developed graduate courses in Mathematical Neuroscience, Information Theory and Stochastic Processes.

Teaching at the University of Houston and Boston University (Graduate courses marked with *)

Spring 2025	Mathematics of Machine and Reinforcement Learning (*) , <i>Graduate level.</i>
Fall 2024	Applied Graph Theory , <i>24 students.</i>
Spring 2024	Transitions to Advanced Mathematics , <i>22 students.</i>
Fall 2023	Introduction to Computational Neuroscience (*) , <i>13 students.</i>
Spring 2023	Applied Graph Theory , <i>32 students.</i>
Fall 2022	Topics in Machine and Statistical Learning (*) , <i>14 students.</i>
Spring 2022	Applied Graph Theory , <i>41 students.</i>
Fall 2021	Introduction to Stochastic Processes , <i>39 students.</i>
Spring 2021	Topics in Machine and Statistical Learning (*) , <i>17 students.</i>
Fall 2020	Stochastic Processes in Biology (*) , <i>16 students.</i>
Spring 2020	Applied Graph Theory , <i>50 students.</i>
Fall 2020	Statistics for the Sciences , <i>60 students.</i>
Spring 2019	Applied Graph Theory , <i>80 students.</i>
Fall 2019	Introduction to Statistics , <i>56 students.</i>
Spring 2018	Applied Graph Theory , <i>54 students.</i>
Spring 2017	Intermediate Analysis , <i>45 students.</i>
Fall 2016	Stochastic Processes in Biology (*) , <i>9 students.</i>
Spring 2015	Honors Statistics , <i>26 students.</i>
Spring 2015	Survey of Undergraduate Mathematics , <i>50 students.</i>
Fall 2014	Introduction to Probability , <i>50 students.</i>
Spring 2014	Linear Algebra , <i>79 students.</i>
Fall 2013–Spring 2014	Probability and Statistics (*) , <i>14 students.</i>
Fall 2012	Introduction to Stochastic Processes , <i>26 students.</i>
Fall 2012	Calculus II , <i>289 students.</i>
Spring 2012	Undergraduate Mathematical Biology , <i>16 students.</i>
Fall 2011	Mathematics of Neuronal Networks (*) , <i>10 students.</i>
Fall 2011	Calculus II , <i>142 students.</i>
Spring 2011	Undergraduate Mathematical Biology , <i>11 students.</i>
Fall 2009, 2010	Stochastic Processes in Biology (*) , <i>12 students.</i>
Spring 2009	Mathematics of Evolutionary Theory , <i>10 students.</i>

Fall 2008–Spring 2009 **Probability and Statistics (*)**, 26 students.

Spring 2008, Fall 2010 **Engineering Mathematics**, *Online course*.

Fall 2007 **Introduction to Information Theory (*)**, 8 students.

Fall 2007 **Complex Analysis**, 12 students.

Spring 2007 **Nonlinear Dynamics**, 18 students.

Spring 2007 **Introduction to Mathematical Neuroscience (*)**, 8 students.

Fall 2006 **Ordinary Differential Equations**, 58 students.

Fall 2006 **Stochastic Processes**, 15 students.

Spring 2006 **Dynamical Systems II (*)**, 7 students.

Fall 2006 **Concepts in Algebra**, 82 students.

Fall 2006 **Dynamical Systems I (*)**, 7 students.

Spring 2005 **Stochastic Processes**, 14 students.

Fall 2004 **Calculus III**, 115 students.

Fall 2003/Spring 2004 **Mathematical and Computational Neuroscience (*)**, 17/11 students, Two semester graduate course.

Spring 2003 **Nonlinear Dynamics 2**, 4 students.

Fall 2002 **Introduction to Statistics and Probability**, 80 students.

Spring 2002 **Graduate Seminar on Invariant Manifolds (*)**, 8 students.

Spring 2002 **Calculus for Life Sciences I**, 60 students.

Fall 2001 **Differential Equations (*)**, 6 students.

Fall 2001 **Methods of Applied Mathematics**, *Undergraduate/graduate*, 20 students.

Spring 2001 **Differential Equations**, 126 students.

Spring 2001 **Calculus II**, 60 students.

Fall 2000 **Differential Equations (*)**, 3 students.

Fall 2000 **Calculus for Life Sciences I**, 60 students.

Spring 2000 **Calculus for Life Sciences II**, 40 students.

Spring 2000 **Discrete Mathematics**, 14 students.

Fall 1999 **Calculus for Life Sciences**, 190 students.

Experience in Working with Undergraduates and High School Students

Undergraduate Research	Supervised undergraduate research of S. McReynolds 2021-present, N. Quazi 2019-2021, I. Korotaeva 2012-2013, S. Carroll 2011-2013, T. Huynh 2009-2010, P. Valenzuela 2009-2010, M. Lopez 2008-2010, M. Lin 2008-2009, S. Kazzaz 2007-2008, N. Laurie and R. Rosenbaum, summer 2006
REU Programs	Supervising 2 REU students in MBI supported REU program (2012-2014); Supervised 3 REU students in GCC-TCN program (2008-2011)
High School Outreach	Guest lecturer in PROMYS program for talented high school students (Summer 2000); Guest lecturer and co-organizer of BU Academy Seminars for high school students (Spring 2000, 2002)
Competition Training	Putnam team trainer at Boston University (Fall 1999 - Spring 2001)
Special Programs	Collaborator in the Honors Calculus Project (Fall 1996 – Fall 1997)

References

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