

Poster Session A

Friday, Jan. 4, 7:30 p.m.–9:30 p.m.

A1. Dynamical Representations of Heterochrony and the Developmental Process

Bradly John Alicea, *Open Worm Foundation, Orthogonal Research and Education Lab*

A2. Quantum Correlations For a Simple Kicked System with Mixed Phase Space

Or Alus, *Rockefeller University*; Shmuel Fishman, *Technion - Israel Institute of Technology*; Mark Srednicki, *University of California Santa Barbara*

A3. Characterizing Atrial Fibrillation Dynamics Using Multiplex Visibility Graphs

Konstantinos N. Aronis, Anastasiya Salova, Ariadna Venegas-Li, Andrea Santoro, *Johns Hopkins University*

A4. Nonlinear Map Model of Functional Quantum Entanglement in Photosynthetic Bacteria

Siegfried Bleher, *Fairmont State University*

A5. Model-Free Control of Chaos with Deep Reservoir Computing

Daniel M. Canaday, Aaron Griffith, Daniel Gauthier, *Ohio State University*

A6. Computation of Sensitivities of Statistics in Chaotic Systems

Nisha Chandramoorthy, Qiqi Wang, *Massachusetts Institute of Technology*

A7. Long-range Interactions of Kinks

Ivan C. Christov, *Purdue University*; Robert J. Decker, A. Demirkaya, *University of Hartford*; Vakhid A. Gani, *National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)*; P. G. Kevrekidis, *University of Massachusetts, Amherst*; R. V. Radomskiy, *P. N. Lebedev Physical Institute of the Russian Academy of Sciences*

A8. Mathematical Model of Gender Bias and Homophily in Professional Hierarchies

Sara M. Clifton, *University of Illinois at Urbana-Champaign*; Kaitlin Hill, *University of Minnesota*; Avinash Karamchandani, *Northwestern University*; Eric Autry, *Duke University*; Patrick McMahon, Grace Sun, *University of Illinois at Urbana-Champaign*

A9. Nonlinear-Linear Alchemy: Koopman Operators, Linear Chaos, and Tape Recorders

Ned J. Corron, *US Army AMRDEC*

A10. Nonequilibrium Statistical Mechanics of Sudden Stratospheric Warming

Justin M. Finkel, Dorian Abbot, Mary Silber, Jonathan Weare, *University of Chicago*

A11. Data-Driven Order Parameters For Coupled Oscillator Models

Oscar L. Goodloe, Joel Nishimura, *Arizona State University*

A12. Using Exact Coherent Structures to Tile the Infinite Spacetime Kuramoto-Sivashinsky Equation

Matthew N. Gurdorf, Predrag Cvitanovic, *Georgia Institute of Technology*

A13. Enhancing the Dynamic Modeling of the Curing of Ethyl Linoleate: Reaction Pathways For Epoxidation

Rebecca E. Harmon, Lindsay H. Oakley, Linda J. Broadbelt, *Northwestern University*

A14. Scalable Learning of Time-varying Vector Autoregression By Low Rank Tensors

Kameron Decker Harris, Aleksandr Aravkin, Rajesh Rao, Bingni Wen Brunton, *University of Washington*

A15. The Effects of Collisions on Observational Signatures of Nonlinear Charged Particle Dynamics in the Magnetotail

Daniel Holland, Phillip Kovarik, Jonathan Sullivan-Wood, *Illinois State University*

A16. Interphase DNA As a Self-returning Random Walk

Kai Huang, Igal Szleifer, *Northwestern University*

A17. The Unruly Effective Diffusion Coefficient of Phase-Locked Bursters

Avinash Jagdish Karamchandani, Hermann Riecke, *Northwestern University*

A18. Dynamical Stability of the Outer Solar System in the Presence of Hypothesized “Planet Nine”

Tali Khain, *University of Michigan*; Konstantin Batygin, Michael E. Brown, *California Institute of Technology*

A19. Levitating Granular Cluster: Typical Behavior and Noise-induced Rare Events

Evgeniy Khain, *Oakland University*

A20. Dynamics of Multi-Agent Reinforcement Learning

Jimmy Kim, Daniel Shams, *Northwestern University*; David Schwab, *ITS CUNY*

A21. New Numerical Evidence That Nonlinearity and Local Depletion Reduce Variability in the Single Photon Response of Vertebrate Rod Photoreceptors

Colin Klaus, *Mathematical Biosciences Institute*; Giovanni Caruso, *Italian National Research Council*; Vsevolod Gurevich, *Vanderbilt*; Clint Makino, *Boston University*; Heidi Hamm, Emmanuele DiBenedetto, *Vanderbilt*

A22. Optimizing Simulations of Shaken Granular Media

Anirrudh Krishnan, Nicholas Corkill, Jonathan Bougie, *Loyola University Chicago*

A23. Computer Simulation of the Atomic Transfer Process in Slotted Systems with an Arbitrary Wall Inclination Angle

Alexander T. Kucher, L.V. Pletnev, G.M. Suslov, C. Zhang

A24. Frequency Shredding and Its Presence in Nonlinear Fluid Flows

Michael Lee, Earl Dowell, *Duke University*

A25. Comparing the Growth of Internet Access Worldwide

Jiachen Liu, Haley Yaple, *Carthage College*

A26. Puzzles and Piecewise Isometries - 1D, 2D, and 3D Possibilities

Lachlan D. Smith, Paul B. Umbanhowar, Julio M. Ottino, Richard M. Lueptow, *Northwestern University*

A27. A Pharmacokinetic Model of Lead-Calcium Interactions

Tucker Lundgren, Anca Radulescu, *State University of New York at New Paltz*

A28. Connected Tiling Structures Within a Fractal Sea

Thomas F. Lynn, *Northwestern University*; Lachlan D. Smith, *University of Sydney*; Julio M. Ottino, Paul B. Umbanhowar, Richard M. Lueptow, *Northwestern University*

A29. Modes of Information Flow

Blanca Daniella Masante Ayala, Ryan G. James, James P. Crutchfield, *University of California Davis*; Bahti Zakirov, *College of Staten Island*

A30. Hebbian Model of the Structural Plasticity in the Olfactory System

John Hongyu Meng, Hermann Riecke, *Northwestern University*

A31. Detecting Dynamically Generated Communities in Complex Networks

Alex Mercanti, Adilson E. Motter, *Northwestern University*

A32. Dimer Chain with Single Impurity

Abhik Mukherjee, Igor Barashenkov, *University of Cape Town, South Africa*

A33. Multifaceted Dynamics of Janus Oscillator Networks

Zachary G. Nicolaou, Deniz Eroglu, Adilson E. Motter, *Northwestern University*

A34. Motif Dynamics on Signed Directed Complex Networks

Youngjai Park^(1,2), Young Jin Kim^(1,3), Seung-Woo Son^(1,2).

¹*Hanyang University, Korea*; ²*University of Calgary, Canada*; ³*Korea Institute of Science and Technology, Korea*

A35. The High Forecasting Complexity of Noisy Periodic Orbits Limits the Ability to Distinguish Them From Chaos

Navendu S. Patil, Joseph P. Cusumano, *Pennsylvania State University*

A36. Asymptotic Sets in Networks of Coupled Quadratic Nodes

Anca Radulescu, Simone Evans, *SUNY New Paltz*

A37. Improved Newton Linearization for L^1 -Norm-Type Minimization with Application to Viscoplastic Fluid Solvers

Johann Rudi, *Argonne National Laboratory*; Georg Stadler, *New York University*; Omar Ghattas, *University of Texas at Austin*

A38. Wavenumber Selection in Pattern Forming Systems

Saloni Saxena, J. Michael Kosterlitz, *Brown University*

A39. Examining Human Unipedal Quiet Stance By Characterizing Smoothness

Matthew R. Semak, Jeremiah Schwartz, Gary Heise, *University of Northern Colorado*

A40. Data-driven Model Selection For a Coarse-Grained Description of Coupled Oscillators

Jordan Snyder, *UC Davis*; Andrey Lokhov, Anatoly Zlotnik, *Los Alamos National Laboratory*

A41. Effects of Shear-rate Dependent Viscosity on the Flow of a Cement Slurry

Chengcheng Tao, Barbara Kutchko, Eilis Rosenbaum, Mehrdad Massoudi, *U.S. DOE National Energy Technology Laboratory*

A42. Forecasting U.S. Elections with Compartmental Models of Infection

Alexandria Volkening, *OSU Mathematical Biosciences Institute*; Daniel F. Linder, *Augusta University*; Mason A. Porter, *University of California Los Angeles*; Grzegorz A. Rempala, *Ohio State University*

A43. Variational and Phase Response Analysis For Limit Cycles with Hard Boundaries, with Applications to Neuromechanical Control Problem

Yangyang Wang, *Mathematical Biosciences Institute, Ohio State University*; Peter Thomas, Hillel Chiel, Jeff Gill, *Case Western Reserve University*

A44. Frequency Entrainment of Coupled Oscillators with Dynamic Interaction

Seong-Gyu Yang (양성규), *Sungkyunkwan University (성균관대학교)*; Hyunsuk Hong (홍현숙), *Chonbuk National University (전북대학교)*; Beom Jun Kim (김범준), *Sungkyunkwan University (성균관대학교)*

A45. Decoys and Dilution: the Impact of Incompetent Hosts on Prevalence of Chagas Disease

Mondal Hasan Zahid, Christopher M. Kribs, *University of Texas at Arlington*
Note: poster A45 has been moved to Saturday.

A46. Random Beats Design in Network Synchronization

Yuanzhao Zhang, Adilson E. Motter, *Northwestern University*

Also note: poster B28 has been moved to Friday's poster session.

B28. Magnetic Resonance Imaging of Porous Media Flow

Blake Gigout, Jeffrey S. Olafsen, *Baylor University*

Poster Session B

Saturday, Jan. 5, 7:30 p.m.–9:30 p.m.

B1. Forecasting Events in the Complex Dynamics of a Semiconductor Laser with Optical Feedback

Andres Aragonese, Meritxell Colet, *Eastern Washington University*

B2. A Step Towards Personalized Cardiac Electrophysiology: Calibrating Virtual Heart Models Using Disease-Specific Action Potential Restitution Curves.

Konstantinos N. Aronis, Patrick M Boyle, Suyeon Ju, Jonathan Chrispin, Joseph Marine, Sunil Sinha, Hari Tandri, Ronald Berger, Hiroshi Ashikaga, Natalia A Trayanova, *Johns Hopkins University*

B3. On Host-genetic Parasite Models

Faina Berezovskaya, *Howard University*; Georgy Karev; *NCBI, NIH*

B4. Snakes and Lattices: Understanding the Bifurcation Structure of Localized Solutions to Lattice Dynamical Systems

Jason Bramburger, Bjorn Sandstede, *Brown University*

B5. Rheology of Transient Polymer Networks and Polymer-Nanoparticle Composites: A Molecular Dynamics Study

Xue-Zheng Cao, M. Gregory Forest, *University of North Carolina at Chapel Hill*

B6. When Is One Variable Enough to Reconstruct a Dynamical System?

Tom Carroll, *US Naval Research Lab*

B7. Non-linear Time Series Analysis of Density-Stratified Gravity Current

Saurabh Chawdhary, Anshu Dubey, *Argonne National laboratory*; Fotis Sotiropoulos, *Stony Brook University*

B8. Shock Instability and Pattern Formation in Vertically Oscillated Granular Media

Nicholas Corkill, Anirrudh Krishnan, Jonathan Bougie, *Loyola University Chicago*

B9. Relation Between Sensitive Systems, Topological Entropy and Baire Set in MDS

Mauricio Díaz, *Universidad Nacional Andrés Bello*

B10. Geometrical Methods For Stochastic Dynamics

Jinqiao Duan, *Illinois Institute of Technology*

B11. Encoding of Multimodal Sensory Information in a Sensorimotor System

Rosangela Follmann, Christopher J. Goldsmith, Wolfgang Stein, *Illinois State University*

B12. Electrochemical Signaling and Oscillatory Growth in Bacillus Subtilis

Noah Ford, David Chopp, Arthur Prindle, *Northwestern University*

B13. Connecting Gene Expression to Cellular Movement: a New Transport Model For Cell Migration

Alexis Grau Ribes, Yannick De Decker, Laurence Rongy, *Université libre de Bruxelles (ULB), Belgium*

B14. Understanding and Designing Emergent Behavior Via Stability Analysis of Mean Field Games

Piyush Grover, *Mitsubishi Electric Research Labs*; Kaivalya Bakshi, Evangelos A. Theodorou, *Georgia Tech*

B15. Data-driven Spatiotemporal Modal Decomposition For Time Frequency Analysis

Seth Michael Hirsh, Bing Brunton, Nathan Kutz, *University of Washington*

B16. A Minimal Mathematical Model For Free Market Competition Through Advertising

Joseph D. Johnson, Daniel M. Abrams, *Northwestern University*

B17. Growing Network Model For Knowledge Space: Micro to Macro Views

Hyunuk Kim, *Pohang University of Science and Technology, Korea*; Daniel Kim, *Natural Science Research Institute, Korea*; Young-Ho Eom, *University of Strathclyde, UK*; Hawoong Jeong, *Korea Advanced Institute of Science and Technology, Korea*; Woo-Sung Jung, *Pohang University of Science and Technology, Korea*; Hyejin Youn, *Northwestern University*

B18. Delay Differential Analysis of Sensory Processing Dysfunction in Schizophrenia

Robert Kim (1,2), Aaron L. Sampson (1, 2), Claudia Lainscsek (1, 2), Michael L. Thomas (2, 3), Karen Man (1), Xenia Lainscsek (4), The COGS Investigators, Neal R. Swerdlow (2), David L. Braff (2, 5), Terrence J. Sejnowski (1, 2), Gregory A. Light (2, 5); Affiliations: (1) *Salk Institute for Biological Studies*; (2) *University of California San Diego*; (3) *Colorado State University*; (4) *Technische Universitat Graz, Austria*; (5) *VISN-22 Mental Illness, Research, Education and Clinical Center (MIRECC), VA San Diego Healthcare System*

B19. Sliding on Moving Strings: From Regular Motions to Nonlinear Resonances and Chaos

Steven R. Knudsen, Leonardo Golubovic, *West Virginia University*

B20. Noise-induced Frequency Increase in Synchronization of Human Rhythmic Activities

Wataru Kurebayashi, Masahiro Okano, Masahiro Shinya, Kazutoshi Kudo, *Shiga University*

B21. A New Frame For Phase Plane Analysis: Using Differential Geometry to Reveal Local Dynamics

Benjamin G. Letson, Jonathan Rubin, *University of Pittsburgh*

B22. Variable Cutting-and-Shuffling to Enhance Mixing

Lachlan Smith, Paul B. Umbanhowar, Julio M. Ottino, Richard M. Lueptow, *Northwestern University*

B23. Automatic Recognition of Multiple Sclerosis Through Gait Data Using Machine Learning Algorithms

Sanjana Menon, Richard Sowers, Manuel Hernandez, *University of Illinois at Urbana-Champaign*

B24. Machine-learning Inference of Variables of a Chaotic Fluid Flow From Data Using Reservoir Computing

Kengo Nakai, Yoshitaka Saiki, *University of Tokyo*

B25. Quasi-Periodicity to Period-Doubling of Parallel-Input/Parallel-Output Buck-Boost DC-DC Converter

Ammar Nimer Natsheh, *Higher Colleges of Technology; Dubai Women's College*

B26. Strain Rate Effects on Quasi-two-dimensional Advection-reaction-diffusion Experiments

Thomas D. Nevins, Douglas Kelley, *University of Rochester*

B27. Multistability in Chemical Networks: Interplay of Coupling Strength and Delay

Simbarashe Nkomo, *Emory University*

B28. Magnetic Resonance Imaging of Porous Media Flow

Blake Gigout, Jeffrey S. Olafsen, *Baylor University*

Note: poster B28 has been moved to Friday.

B29. Complex Contagion Leads to Complex Dynamics in Models Coupling Behavior and Disease

Matthew T. Osborne, *Ohio State University*; Xueying Wang, *Washington State University*; Joseph H. Tien, *Ohio State University*

B30. Stability of Multi-pulse Solutions to Nonlinear Wave Equations

Ross Hamilton Parker, Björn Sandstede, *Brown University*

B31. Empirical Determination of the Optimum Attack For Fragmentation of Modular Networks

Carolina A. Pereira, Sebastián Gonçalves, *Federal University of Rio Grande do Sul (UFRGS)*; Bruno Requião da Cunha, *Federal Police*

B32. Drainage Through Holes Drives Arctic Sea Ice Melt Ponds to the Critical Percolation Threshold

Predrag Popovic, Mary C. Silber, Dorian S. Abbot, *University of Chicago*

B33. Standard Map-like Models For Single and Multiple Walkers in an Annular Cavity

Aminur Rahman, *Texas Tech University*

B34. Active Suspension of Self Rotating Particles

Cody Reeves, *Northwestern University*; Igor Aronson, *Penn State*; Petia Vlahovska, *Northwestern University*

B35. Chaos Mediated Synchronous Neuronal Transitions

Epaminondas Rosa, Annabelle Shaffer, Zach Mobbille, George Rutherford, Rosangela Follmann, *Illinois State University*

B36. Parametrically Excited Bihyhythmic Generalised Van Der Pol Model

Sandip Saha, Gautam Gangopadhyay, *S N Bose National Centre for Basic Sciences, India.*

B37. Koopman Operator and Its Approximations For Dynamical Systems with Symmetries

Anastasiya Salova, Jeffrey Emenheiser, Adam Rupe, James Crutchfield, Raissa D'Souza, *University of California, Davis*

B38. A Mechanistic Framework For Transcriptional Regulation Through Intranuclear Crowding Kinetics

Anne R. Shim, Rikkert J. Nap, Luay Almassalha, Hiroaki Matusda, Vadim Backman, Igal Szleifer, *Northwestern University*

B39. Bayesian Parameter Estimation in the Spatial Organization of Metabolism

Sasha Shirman, Svetlana P. Ikonomova, Taylor Nichols, Keith E.J. Tyo, Danielle Tullman-Ereck, Niall Mangan, *Northwestern University*

B40. The Lotka Model: One Century Later

Gessner Antonio Soto, *University of Colorado*

B41. Controlling a Belousov-Zhabotinsky Droplet Using a Light Intensity Gradient

Syed Jazli Syed Jamaluddin, *West Virginia University*; Kritsana Khaothong, *Kasetsart University, Thailand*; Mark Tinsley, Kenneth Showalter, *West Virginia University*

B42. New Amplitude Equations For Ocean Waves

Jim Thomas, *Dalhousie University and Woods Hole Oceanographic Institution*

B43. Measurement Induced Complexity in Quantum Dynamics

Ariadna E. Venegas-Li, Fabio Anza, James P. Crutchfield, *University of California Davis*

B44. The Effect of Diffusion on Mixing By Cutting and Shuffling

Mengying Wang, *Northwestern University*; Ivan C. Christov, *Purdue University*

B45. Enhancing the Synchronization of Coupled Rhythms Through Intrinsic Network Heterogeneity

Xize Xu, Hermann Riecke, *Northwestern University*

B46. Emotions Predict Presidential Voting Choices

Vicky Chuqiao Yang, *Santa Fe Institute*

B47. Pattern Formation in a Fully-3D Segregating Flow

Mengqi Yu, Paul B. Umbanhowar, Julio M. Ottino, Richard M. Lueptow, *Northwestern University*

Also note: poster A45 has been moved to Saturday's poster session.

A45. Decoys and dilution: the impact of incompetent hosts on prevalence of Chagas disease

Mondal Hasan Zahid, Christopher M. Kribs, *University of Texas at Arlington*