

PROGRAM SCHEDULE

Monday, May 14

Undergraduate Student Research Day

8:00 a.m. – 8:45 a.m. **Registration** (Coffee and Pastries) Kupfrian 1st Floor Lobby

8:45 a.m. – 12:00 p.m. **Student Presentations: Morning Session** Kupfrian 118

MORNING SESSION

8:45 a.m. **Katherine Dunning**, Arizona State University
Effects of Light Intensity on Daphnia Dynamics and Coexistence: A Stoichiometric Perspective

9:00 a.m. **Claire Pettit**, University of Louisiana
A Discrete-Time Three-Stage Population Model for Hyla cinerea Green Treefrog

9:15 a.m. **Abraham Rosales**, New Jersey Institute of Technology
Understanding Colonial Wading Bird Metapopulation Dynamics in NJ Meadowlands and NY Harbors

9:30 a.m. **Colin Kremer**, State University of New York at Geneseo
Chaotic Dynamics Lost in Small-World Network Metapopulations

9:45 a.m. **Neil Miller and Joel Adornetto**, Buffalo State College
Modified SIR Models to Forecast Epidemics

10:00 a.m. **Paula Piedrahita**, Arizona State University
Tropical Rain Forest Sustainability: A Mathematically Model Approach

Fifteen minute break

10:30 a.m. **Cassie Pawling**, Arizona State University
A Proposed High School Mathematics Course: Introduction to Mathematical Biology

10:45 a.m. **Reginald Dorcely and Frantz Voltaire**, Medgar Evers College of CUNY
Application of Singular Value Decomposition (SVD) Theorem and Principal Components Analysis (PCA) to Air Sampling

11:00 a.m. **Jamila Hedhli, Joe Brachocki, Sanjay Muddam, and Daniel Fong**, New Jersey Institute of Technology
Instability of the Fluid Strip

11:15 a.m. **Ellen Marie Schmidt**, State University of New York at Geneseo
Variations on Linear Regression

11:30 a.m. **Susan Bloomberg**, New York University
Common Statistical Properties of Bi-Stable Visual Phenomena

11:45 a.m. **Christopher Khalil, Arif Patel, and Arlene Pineda**, New Jersey Institute of Technology
Measurements of Membrane Capacitance in Neurons

12:00 p.m. - 1:30 p.m. **Lunch** Campus Center 3rd floor

1:30 p.m. - 4:45 p.m. **Student Presentations: Afternoon Session** Kupfrian 118

AFTERNOON SESSION

- 1:30 p.m. **Christian Volk**, Canisius College
The Evolution of Proliferating Cells During the Course of Chemotherapy
- 1:45 p.m. **Tagan Griffin, Loan Nguyen, Abdessamad Tridane, and Yang Kuang**, Arizona State University
Modeling B-cell Dysfunction in HIV infection
- 2:00 p.m. **Jasneet Kaur and Tao Lin**, New Jersey Institute of Technology
Impact of constitutively active RhoA and change in cell shape on mitotic spindle orientation
- 2:15 p.m. **Jacob Ham and Dawn Clemons**, Purdue University Calumet
A Three-Dimensional Simulation of Endothelial Cell Motility in Tumor Angiogenesis
- 2:30 p.m. **Arunima Ray and Aaron Young**, State University of New York at Geneseo
Random DNA Statistics
- 2:45 p.m. **Leslie Padrnos**, Arizona State University
The Birthing Question: Mathematical Modeling and the Decisions that Influence Mode of Delivery
- Fifteen minute break*
- 3:15 p.m. **Russell Latterman**, Arizona State University
Monte Carlo Model of Convergent Extension in the Ascidian Notochord
- 3:30 p.m. **Andrew Christian, Abraham Rosales, and Jason Ju**, New Jersey Institute of Technology
Simulations and Experiments of Evaporative Drops
- 3:45 p.m. **Sebastian Acosta**, Brigham Young University
Elliptic Grid Generator with Adaptive Control Functions
- 4:00 p.m. **Colin T. Waters**, State University of New York at Geneseo
Construction of DNA Combinatorial Libraries for Use in DNA Computing
- 4:15 p.m. **Nick P. Tatonetti**, Arizona State University
MetabolODE: Optimization Software for Determining Kinetic Rate Coefficients for Biochemical Pathways of Metabolic Isotopomers
- 4:30 p.m. **Azfar Aziz, Kelly Crowe, and Michael DeCaro**, New Jersey Institute of Technology
Shape and Break-up of a Pendant Drop

5:00 p.m. - 6:00 p.m. **Plenary Lecture**
David Terman, Ohio State University
Neuronal Dynamics

Kupfrian 118

UNDERGRADUATE RESEARCH DAY ORGANIZING COMMITTEE
Amitabha Bose and Zoi-Heleni Michalopoulou (New Jersey Institute of Technology)
Anthony Macula (State University of New York at Geneseo)

PROGRAM SCHEDULE

Tuesday, May 15

8:00-8:45 a.m.	Registration + coffee and pastries Set Up Posters Poster session all day	Kupfrian 1 st floor lobby Kupfrian 103,104,107,108
8:45-9:00 a.m.	Introductory Remarks Daljit S. Ahluwalia, Chair Department of Mathematical Sciences	Theater
	Welcoming Address President Robert Altenkirch	Theater
9:00-10:00 a.m.	PLENARY LECTURE I Nancy Kopell , Boston University <i>Multiple Rhythms and Switches in the Nervous System</i>	Theater
10:00-10:30 a.m.	Coffee Break	Kupfrian 1 st floor lobby

MINISYMPOSIA I

	Mathematical Biology I Kupfrian 117 <i>Chair: Louis Tao, NJIT</i>	Mathematical Biology II Kupfrian 118 <i>Chair: Gareth Russell, NJIT</i>	Waves I Kupfrian 106 <i>Chair: Roy Goodman, NJIT</i>
10:30-11:00 a.m.	Alex Reyes New York University <i>Synchrony in Feedforward Networks: Dependence on Single Cell Statistics and Network Size</i>	Gregor Fussmann McGill University <i>Eco-Evolutionary Dynamics</i>	Jie Shen Purdue University <i>Efficient and Stable Spectral Methods for the Helmholtz Equation in Exterior Domains</i>
11:00-11:30 a.m.	Horacio Rotstein New Jersey Institute of Technology <i>Rhythmic Mixed-Mode Oscillatory Activity in Entorhinal Cortex Stellate Cells</i>	Yang Kuang Arizona State University <i>Resource Quality Dynamics and Its Implications</i>	Tobias Schäfer City University of New York <i>Coarse-Graining Noise in Stochastic Ordinary Differential Equations with Multiple Time Scales</i>
11:30-12:00 noon	Carmen Canavier LSU Health Sciences Center <i>Pulse Coupled Oscillators</i>	Abdul-Aziz Yakubu Howard University <i>Spatially Discrete Dispersal- Linked Models with Directional Dispersal</i>	Keith Promislow Michigan State University <i>Pore Formation in Polymer Electrolyte Membranes</i>
12:00-12:30 p.m.	Robert Butera Georgia Tech <i>Weak Coupling and Neuronal Synchronization - A Mathematical Abstraction or Biophysical Reality?</i>	Gareth Russell New Jersey Institute of Technology <i>Ecological Communities: How Does Nature Construct Them?</i>	Rudy Horne Florida State University <i>Random Dispersion and Four-Wave Mixing in an Optical Fiber</i>

12:30-2:30 p.m. Lunch and Poster Session Kupfrian 1st floor lobby
Kupfrian 103,104,107,108

2:30-3:30 p.m. **PLENARY LECTURE II** Theater
Sheldon Weinbaum, CUNY
A New View of the Classic Starling Hypothesis for Microvascular Exchange

3:30-4:00 p.m. **National Science Foundation Presentation** Theater
Henry Warchall

4:00-4:30 p.m. **Coffee Break** Kupfrian 1st floor lobby

MINISYMPOSIA II			
	Mathematical Biology III Kupfrian 117 <i>Chair: Victor Matveev, NJIT</i>	Mathematical Biology IV Kupfrian 118 <i>Chair: Cyrill Muratov, NJIT</i>	Mathematical Fluid Dynamics I Kupfrian 106 <i>Chair: Lou Kondic, NJIT</i>
4:30-5:00 p.m.	Charles Wilson University of Texas at San Antonio <i>Generation of Natural Firing Patterns of Striatal Cholinergic Interneurons</i>	Glen Webb Vanderbilt University <i>Modeling Antibiotic Resistance Epidemics in Hospitals</i>	Sarah Waters University of Nottingham <i>Three-Dimensional Flows in Rapidly Oscillating Vessels</i>
5:00-5:30 p.m.	Jorge Golowasch New Jersey Institute of Technology <i>Activity in Gap Junction-Coupled Networks Depends on Dendrite Diameters</i>	John King University of Nottingham <i>Population-Scale Modelling of Cellular Chemotaxis and Aggregation</i>	Mark Sussman Florida State University <i>Adaptive Solution Techniques for Fluid-Structure Interaction and Multiphase Flow</i>
5:30-6:00 p.m.	David Terman Ohio State University <i>Multiple Attractors and Transient Synchrony in a Model for an Insect's Antennal Lobe</i>	Tasso Kaper Boston University <i>Wave Speeds for Reaction-Diffusion Systems with Cutoffs</i>	Mark Blyth University of East Anglia <i>Manipulation of Liquid Film Flows</i>

6:15-9:00 p.m. **Banquet** Campus Center Atrium

PROGRAM SCHEDULE

Wednesday, May 16

8:00-8:45 a.m.	Coffee and pastries Poster session (half day)	Kupfrian 1 st floor lobby Kupfrian 103,104,107,108
9:00-10:00 a.m.	PLENARY LECTURE III Leslie Greengard , Courant Institute of Mathematical Sciences <i>Electromagnetic Scattering and Design</i>	Theater
10:00-10:30 a.m.	Coffee Break	Kupfrian 1 st floor lobby

MINISYMPOSIA III

	Mathematical Biology V Kupfrian 117 <i>Chair: Horacio Rotstein, NJIT</i>	Mathematical Fluid Dynamics II Kupfrian 118 <i>Chair: Wooyoung Choi, NJIT</i>	Biostatistics I Kupfrian 106 <i>Chair: Manish Bhattacharjee, NJIT</i>
10:30-11:00 a.m.	Steven J. Cox Rice University <i>Real-Time Inference of Channel and Receptor Distributions from Calcium Fluorescence Data</i>	Lisa Fauci Tulane University <i>Fluid Dynamic Models of Spirochete Motility</i>	Ian McKeague Columbia University <i>Functional Regression Analysis with Trajectories as Predictors</i>
11:00-11:30 a.m.	Alla Borisyuk University of Utah <i>Fluctuation-Driven Rhythmogenesis in an Excitatory Neuronal Network with Slow Adaptation</i>	Aaron Fogelson University of Utah <i>Multi-velocity Viscoelastic Flow in Blood Clotting and other Physiological Systems: Models and Numerics</i>	Ram Tiwari National Cancer Institute <i>New Developments in Population-Based Survival: Estimation of Fraction of Cured Cancer Patients</i>
11:30-12:00 noon	Stephen Coombes University of Nottingham <i>A Bidomain Threshold Model of Intracellular Calcium Release and Propagating Calcium Waves</i>	Isaac Klapper Montana State University <i>A Physical View of Microbial Colony Structure</i>	Pranab K. Sen University of North Carolina at Chapel Hill <i>Kendall's Tau in High-Dimension Parsimony</i>
12:00-12:30 p.m.	Victor Matveev New Jersey Institute of Technology <i>Capturing the Multistable Anti-Phase Bursting in a Two-Cell Inhibitory Network Using a One-Dimensional Map</i>	Martin Bazant Massachusetts Institute of Technology <i>Induced-Charge Electro-osmosis</i>	José Pinheiro Novartis Pharmaceuticals <i>Design Issues in Confirmatory Clinical Trials with Longitudinal Endpoints</i>

12:30-2:00 p.m.	Lunch and Poster Session Removal of posters	Kupfrian 1 st floor lobby Kupfrian 103,104,107,108
2:00-3:00 p.m.	PLENARY LECTURE IV Jack Cowan , University of Chicago <i>Statistical Mechanics of Activity in Biological Networks</i>	Theater
3:00-3:30 p.m.	Coffee Break	Kupfrian 1 st floor lobby

MINISYMPOSIA IV			
	Mathematical Biology VI Kupfrian 117 <i>Chair: Amitabha Bose, NJIT</i>	Waves II Kupfrian 118 <i>Chair: Peter Petropoulos, NJIT</i>	Biostatistics II Kupfrian 106 <i>Chair: Sunil Dhar, NJIT</i>
3:30-4:00 p.m.	Xiao-Jing Wang Yale University <i>A Recurrent Neural Circuit Model of Working Memory and Decision Making</i>	Moysey Brio University of Arizona <i>Stability of FDTD Algorithms with Local Mesh Refinement for Maxwell's Equations</i>	Hira Koul Michigan State University <i>Goodness-of-Fit Testing in Interval Censoring Case 1</i>
4:00-4:30 p.m.	Frances Skinner Toronto Western Research Institute, UHN <i>Tuning Network Dynamics with Gap Junctions Located at Distal Dendritic Sites</i>	Yu Chen Courant Institute of Mathematical Sciences <i>Gaussian Quadratures and Signal Processing</i>	Ming-Hui Chen University of Connecticut <i>Bayesian Variable Selection and Computation for Generalized Linear Models with Conjugate Priors</i>
4:30-5:00 p.m.	André Longtin University of Ottawa <i>Extracting Time Scales with Feedback and Nonlinearity</i>	Thomas Hagstrom University of New Mexico <i>Complete Plane Wave Expansions, Optimal Local Radiation Boundary Conditions and Optimal Perfectly Matched Layers</i>	Bahjat Qaish University of North Carolina at Chapel Hill <i>Regression Models for Multivariate Categorical Outcomes</i>
5:00-5:30 p.m.	Louis Tao New Jersey Institute of Technology <i>Spatio-Temporal Dynamics of Contrast Adaptation in Visual Cortex</i>	Alejandro Aceves University of New Mexico <i>Modeling Nonlinear Pulse Dynamics in Photonic Structures</i>	Kaushik Ghosh New Jersey Institute of Technology <i>Prediction of U.S. Cancer Mortality Counts Using Semiparametric Bayesian Techniques</i>

End of conference