Forty-Seventh Annual Mathematics Conference
“Differential Equations and Dynamical Systems and their Applications”
September 20-21, 2019

All activities are held in Bachelor Hall, Miami University

Friday, September 20

1:00 pm Welcome and Introductions
Room 101
Opening Remarks
Renate Crawford, Miami University.

1:15 pm Invited Address
Room 101
Björn Sandstede, Brown University,
Dynamics of nonlinear waves and patterns.

2:15 pm Break

2:30 pm Invited Address
Room 101
Todd Young, Ohio University,
Temporal clusters prefer to be equally distributed - an example from the yeast cell cycle.

3:30 pm Break
Parallel Sessions

Room 110
3:45 pm - 4:15 pm Julia Arciero, Indiana University–Purdue University Indianapolis, *Maximizing the potential of Treg-based therapies for transplant rejection via mathematical modeling: effect of dose, timing, and distribution.*

4:20 pm - 4:35 pm Erin Ellefsen, University of Colorado Boulder, *Efficiently finding steady states of nonlocal territorial models in Ecology.*

Room 112
3:45 pm - 4:15 pm Darryl Nester, Bluffton University, *Compartmental Analysis, SIR models, and the Zombie Apocalypse.*

4:20 pm - 4:35 pm Roshini Gallage, Southern Illinois University, Carbondale, *Approximation of continuously distributed delay differential equations.*

Room 114
3:45 pm - 4:15 pm Steve Harnish, Bluffton University, *Analyzing MD simulations and iterated function systems via 'Feasts and Famines' of image processing.*

4:20 pm - 4:35 pm Stephane Lafortune, College of Charleston, *Stability of traveling waves in a model for a thin liquid film flow.*

Invited Address

Room 101

Nancy Rodríguez, University of Colorado Boulder,  
*A story on the ideal free distribution, the Allee effect, and competition through the lens reaction-advection-diffusion equations.*
5:45 pm  Courtyard Pizza Party
(Reservations Required)

7:00 pm  Pi Mu Epsilon Student Talks

Room 110
7:00 pm - 7:15 pm Margaret McGuire, The College of Wooster, *Reaction-diffusion models of 2D surfaces embedded in 3D space and a model of geographic tongue.*

7:20 pm - 7:35 pm Sylvia Yu, The College of Wooster, *Reaction-diffusion wavefronts with concave, spiral, fractals and soft obstacles.*

7:40 pm - 7:55 pm Phuong Ho, Miami University, *Quantum generalized Weyl algebra.*

8:00 pm - 8:15 pm Melita Wiles, The College of Wooster, *Energy stability of gravitationally interacting rods and dumbbells.*

8:20 pm - 8:50 pm Chloe Makdad, Butler University, *An extension theorem for bicomplex functions.*

8:55 pm - 9:10 pm Sara Helwig, Ohio Northern University, *Statistical consulting for the DoD: The Importance of Effective and Efficient Experimental Designs.*

Room 112
7:00 pm - 7:15 pm Benjamin Rempfer, Butler University, *Geometric limits of Julia sets for a non-hyperbolic Siegel disk map.*

7:20 pm - 7:35 pm Kendra Herweck, Northern Kentucky University, *Star formation: modeling the loss of magnetic support for dense core.*
7:40 pm - 7:55 pm Chase Fuller, The College of Wooster, 
*Chemical diode behavior in the Belousov-Zhabotinsky reaction due to inhomogeneous diffusion.*

8:00 pm - 8:15 pm Alex Hwang, The College of Wooster, 
*Dynamic market equilibrium: price behind the scenes.*

8:20 pm - 8:50 pm Troy Wiegand, Butler University, 
*Discerning complex Hadamard submatrices of the Fourier matrices via primitive sets.*

8:55 pm - 9:10 pm Steven Collar, Miami University, 
*Fronts in a model for competitive exothermic combustion.*

**Room 114**

7:00 pm - 7:15 pm Jonathan Ford, Northern Kentucky University, *Exploring neural networks with Mathematica.*

7:20 pm - 7:35 pm Michael Pavelites, Fairmont State University, *Discrete Analogues of Chebyshev Polynomials.*

7:40 pm - 7:55 pm Dejuan Winters, Butler University, 
*Geometric limits of Julia sets with a parabolic implosion.*

8:00 pm - 8:15 pm Marzieh Bakhshi, Miami University, 
*A chain rule for a generalized derivative.*

8:20 pm - 8:50 pm Yangxinyu Xie, University of Texas at Austin, *On tropical commuting matrices.*

8:55 pm - 9:10 pm Thong Ngo, Centre College, *The Jones polynomial of Montesinos link.*

**Room 102**

7:00 pm - 7:15 pm Ryan Oostland, Bluffton University, 
*Mathematics and algorithms to detect crystalline defects in Molecular Dynamics (MD) simulations.*
7:20 pm - 7:35 pm Jacob Fryman, Northern Kentucky University, *Exploring neural networks with Mathematica*.

7:40 pm - 7:55 pm Corey Thrush, Ohio Northern University, *Zero sum two player games*.

8:00 pm - 8:15 pm Andrew Loewe, Ohio Northern University, *Sabermetrics - what, why, and is it good for the game?*

8:20 pm - 8:35 pm Jacob Charboneau, Butler University, *Finding small sizes of Modulo Difference Covers*.

8:55 pm - 9:10 pm David Gregory, Butler University, *Finding small sizes of Modulo Difference Covers*. 
Saturday, September 21

8:30 am  Coffee and Doughnuts
Room 115A

9:00 am  Invited Address
Room 101
Arnd Scheel, University of Minnesota,
  Patterning and self-organization beyond Turing: from myxobacteria to flatworms.

10:00 am -10:15 am  Break

Parallel Sessions

Room 110
10:15 am - 10:45 am Chunhua Shan, University of Toledo,
  Periodic phenomena and driven mechanisms in transmission of West Nile virus with maturation time.

10:50 am - 11:20 am Scott Kaschner, Butler University,
  Superstable nanifolds and the Ising model on hierarchical lattices.

11:25 am - 11:55 am Kyle Claassen, Rose-Hulman Institute of Technology,
  Numerical bifurcation and spectral stability of wavetrains in bidirectional Whitham models.

Room 112
10:15 am - 10:45 am Ivan Sudakov, University of Dayton,
  Bifurcation analysis of species extinction in large competitive populations.

10:50 am - 11:20 am Son Van, Carnegie Mellon University,
  Optimal heat transfer in a box.

11:25 am - 11:55 am Quiliang Wu, Ohio University,
The effect of impurities on stripes in multi-dimensional extended domains.

Room 114
10:15 am - 10:45 am Niklas Manz, The College of Wooster,
Visualizing dynamical systems with fire fronts.

10:50 am - 11:20 am Veronica Ciocanel, The Ohio State University,
Insights for cellular transport from partial differential equations models.

11:25 am - 11:55 am Peter Gordon, Kent State University,
Gelfand-type problem for turbulent jets.

12:00 pm Picnic Lunch
Bachelor Hall (Reservations Required)
Courtyard

Parallel Sessions

Room 110
1:30 pm - 1:45 pm Naum Gershenzon, Wright State University,
Application of Sine-Gordon modulation equations for investigation of instability of frictional sliding.

1:50 pm - 2:20 pm Andrei Prokhorov, University of Michigan,
Connection problem for Painlevé tau functions.

2:25 pm - 2:55 Ben Akers, Air Force Institute of Technology,
Dimension breaking in models for interfacial waves.

3:00 pm - 3:15 pm King-Yeung Lam, The Ohio State University,
Monotonicity and global dynamics of a nonlocal two-species phytoplankton model.

Room 112
1:30 pm - 1:45 pm Phillip Korman, University of Cincinnati,
Numerical computation of global solution curves using global parameters.

1:50 pm - 2:20 pm  Peter Thomas, Case Western Reserve University, Two approaches to phase reduction for stochastic oscillators.

2:25 pm - 2:55 pm Shusen Pu, Case Western Reserve University, Stochastic shielding for stochastic conductance-based neural models under current clamp.

3:00 pm - 3:15 pm Thomas Hill, University of Cincinnati, New method for dispersive estimates of second order Schrodinger equation.

3:20 pm - 3:50 pm Chanaka Kottegoda, University of Toledo, Bifurcation analysis of predator-prey system with Holling Type IV functional response and Allee effect.

Room 114
1:30 pm - 1:45 pm Laurence Robinson, Ohio Northern University, How important is a course in differential equations for statisticians?

1:50 pm - 2:20 pm Tom Cuchta, Fairmont State University, Introduction to calculus on time scales with some applications.

2:25 pm - 2:55 pm Qingbo Huang, Wright State University, Regularity theory for fully nonlinear elliptic equations with asymptotical approximate convexity.

3:00 pm - 3:15 pm Shuang Liu, Renmin University of China, On principal eigenvalues of second order elliptic operators with drift.

Support
The conference is supported by the Department of Mathematics of Miami University through Buckingham and Bohn Scholarships and by the National Science Foundation.

#MiamiOHMath19