The 42nd Southeastern-Atlantic Regional Conference on Differential Equations

Titles and Abstracts

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Saturday
November 9, 2024
(Hodges Hall)

8:00 AM - 8:30 AM	**Registration and Breakfast**						
8:30 AM - 8:45 AM	Introductory Remarks: **Melanie Page** Associate Vice President for Creative and Scholarly Activities West Virginia University **(Hodges Hall 202)**						
8:45 AM - 9:45 PM	Plenary Speaker 1: **Robert Pego** *Carnegie Mellon University* Rigidly breaking potential flows and a countable Alexandrov theorem for polytopes **(Hodges Hall 202)**						
9:45 AM - 10:00 AM	**Coffee Break**						
10:00 AM - 12:00 PM	**Section A1** **Chair: Charis Tsikkou** **(Hodges Hall 210)**	**Section A2** **Chair: Adrian Tudorascu** **(Hodges Hall 214)**	**Section A3** **Chair: Dhruba Adhikari** **(Hodges Hall 220)**	**Section A4** **Chair: Casian Pantea** **(Hodges Hall 301)**	**Section A5** **Chair: Ryan Murray** **(Hodges Hall 307)**	**Section A6** **Chair: Adam Halasz** **(Hodges Hall 308)**	**Section A7** **Chair: Changhui Tan** **(Hodges Hall 312)**
	Maja Taskovic *Emory University* On the inhomogeneous wave kinetic equation and the associated hierarchy	**Prerona Dutta** *Xavier University of Louisiana* Well-posedness and continuity properties of the two-component Fornberg-Whitham system in Besov spaces	**John Holmes** *The Ohio State University* The Fokas transform method for Burgers' equation	**Kushani De Silva** *University of North Carolina at Greensboro* Exploring the Dynamics and Stability of Dengue Transmission: The Influence of Vector-Pathogen Interactions and Climatic Factors	**Nasir Yasin** *Old Dominion University* Flow Patterns Behind Stationary and Moving Bluff Bodies Utilizing the SRC-Lattice Boltzmann Method	**Tahmineh Azizi** *Washington University* An application of the Grünwald-Letinkov fractional derivative to a study of drug diffusion in pharmocokinetic compartmental models	**John Gemmer** *Wake Forest University* Tipping in a low-dimensional model of a tropical cyclone
	Shalmali Bandyopadhyay *The University of Tennessee at Martin* Positive Solutions to Singular Second Order BVP on Time Scales	**Maya Chhetri** *University of North Carolina at Greensboro* An interpolation approach to L∞ a priori estimates for elliptic problems with nonlinearity on the boundary	**Byungjae Son** *Ohio Northern University* On positive solutions to double phase problems with strong singular weights and nonlinearities	**Lorand Parajdi** *"Babeș-Bolyai" University* Lower and Upper Solution Method for Control Problems: Application to an Allogeneic Bone Marrow Transplantation Model	**Zhaiming Shen** *Georgia Institute of Technology* Matrix Cross Approximation for Image Compression and Least Squares Approximation	**Robert Ireri** *Marshall University* A Numerical Method for Coefficient Reconstruction of a Periodic Inverse Source Problem	**Shohreh Gholizadeh Siahmazgi** *Wake Forest University* Mean Exit Times for Perturbed Gradient Systems
	Ian Tice *Carnegie Mellon University* Traveling wave solutions to the free boundary Navier-Stokes equations	**Teemu Saksala** *North Carolina State University* Inverse Problem for Hyperbolic Partial Differential Operators on Riemannian Manifolds Without Boundary	**Tom Cuchta** *Marshall University* Periodic functions with nonuniform domains	**Mohyeedden Sweidan** *Concord University* Analysis of the Shortley-Weller Scheme for Variable Coefficient Boundary Problems: Applications to Tumor Growth Modeling in Heterogeneous Environments	**Kayode Oluwasegun** *Drexel University* Investigation of oceanic wave solutions to a modified (2 + 1)-dimensional coupled nonlinear Schrodinger system	**Tom Lewis** *University of North Carolina at Greensboro* Convergent methods for approximating sublinear semipositone reaction diffusion equations	**Isabel Barrio Sanchez** *University of Pittsburgh* Long-term H^1-Stability of Cauchy's Method for the Navier-Stokes Equations
	Ming Chen *University of Pittsburgh* Bifurcation for hollow vortex desingularization	**Tien Khai Nguyen** *North Carolina State University* Generic properties of solutions to Hamilton-Jacobi equations	**Md Ibrahim Kholil** *Norfolk State University* A Uniqueness Theorem for Inverse Problems in Quasilinear Anisotropic Media	**Divine Wanduku** *Georgia Southern University* Mean-field differential equation ecological models with general survival lifetime distributions in a renewal process	**Davis Funk** *West Virginia University* Solving the Wave Equation on Discrete Time Scales	**Jeff Borggaard** *Virginia Tech* Polynomial Feedback Control of Navier-Stokes Equations	**Richard Williams** *Marshall University* The Heat Equation on Discrete Time Scales
12:00 PM - 01:00 PM	**Lunch**						

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01:15 PM - 02:15 PM

Plenary Speaker 2: **Gheorghe Craciun**
University of Wisconsin-Madison
Polynomial dynamical systems and reaction networks: persistence and global attractors
(Hodges Hall 202)

02:30 PM - 04:30 PM

Section B1
Chair: Charis Tsikkou
(Hodges Hall 210)

Dhruba Adhikari
Kennesaw State University
Nontrivial Solutions of Inclusions Involving Perturbations of Positively Homogeneous Maximal Monotone Operators

Lili Yan
University of Minnesota, Twin Cities
Inverse boundary problems for elliptic operators on Riemannian manifolds

Van Le
University of Tennessee, Knoxville
Existence and uniqueness of solutions to stationary Navier-Stokes equations in the upper-half plane

Junyuan Fang
University of Tennessee, Knoxville
Harnack inequality for degenerate parabolic equations in non-divergence form

Section B2
Chair: Adrian Tudorascu
(Hodges Hall 214)

Madhumita Roy
North Carolina State University
Existence of global attractors for a semilinear wave equation with nonlinear boundary dissipation and nonlinear interior and boundary sources with critical exponents

Pierre Aime Feulefack
University of Pennsylvania
Bifurcation results and multiple solutions for the fractional (p,q)-Laplace operator

Antonio Pierrottet
Clemson University
Recovering all coefficients in the Schrödinger equation by finite sets of measurements

FNU Shumaila
Miami University
Computation of K-Functional for Sobolev Spaces on Riemannian Manifolds

Section B3
Chair: Ian Tice
(Hodges Hall 220)

Timothy Myers
Howard University
A Constructive Solution to The Ornstein-Uhlenbech Operator Equation on a Separable Banach Space

Jonathan Stanfill
The Ohio State University
Factorizations and Power Weighted Rellich and Hardy-Rellich-Type Inequalities

Evangelia Ftaka
North Carolina State University
Piecewise Regular Solutions to Scalar Balance Laws with Singular Nonlocal Sources

Andrew Shedlock
North Carolina State University
Lipschitz Stability of Travel Time Data

Section B4
Chair: Casian Pantea
(Hodges Hall 301)

David Swigon
University of Pittsburgh
Qualitative inverse problems: mapping data to trajectory features of an ODE model

Maya Mincheva
Northern Illinois University
Efficient computation of Hopf bifurcation points for mass action systems

Balázs Boros
University of Wisconsin-Madison
The smallest bimolecular mass-action systems admitting Andronov-Hopf bifurcation

Jiaxin Jin
University of Louisiana at Lafayette
Infinitesimal Homeostasis in Mass-Action Systems

Section B5
Chair: Adam Halasz
(Hodges Hall 307)

Ryan Murray
North Carolina State University
Regularization via Dirichlet energies for active learning

Valentin Kunz
The Ohio State University
Several Complex Variables and the Quarter-Plane problem

Rachel Morris
North Carolina State University
Uniform convergence guarantees for adversarially robust learning

Rui Fang
University of Pittsburgh
Adaptive Parameter Selection in Nudging Based Data Assimilation

Section B6
Chair: Loc Hoang Nguyen
(Hodges Hall 308)

Md Mashud Parvez
Old Dominion University
A Strict Physicality-Preserving Scheme for a 2D Q-Tensor Flow with a Singular Potential

Zhuoran Wang
University of Kansas
Convergence analysis of GMRES with inexact block triangular preconditioning for saddle point systems with application to WG FE approximation of Stokes flow

Rebecca Oduro
Marshall University
First-order Nabla Riemann--Liouville fractional difference equations

Jocelyn Quaintance
MCIT Online, University of Pennsylvania
Parabolic Compactification: Construction and Critical Points, Finite and at Infinity

Section B7
Chair: Tien Khai Nguyen
(Hodges Hall 312)

Kubilay Dagtoros
Norfolk State University
Direct and Indirect Simulation Techniques

Qinying Chen
University of Delaware
Evaporation-driven tear film thinning and breakup in two space dimensions

Andrew Hicks
Carnegie Mellon University
Modeling and Simulation of the Cholesteric Landau-de Gennes

Wasiu Sule
Marshall University
Gompertz distribution on time scales

04:30 PM - 04:45 PM

Coffee Break

04:45 PM - 05:45 PM

Plenary Speaker 3: **Jeff Calder**
University of Minnesota
PDEs and graph-based semi-supervised learning
(Hodges Hall 202)

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Sunday
November 10, 2024
(Hodges Hall)

8:00 AM - 8:45 AM	**Breakfast**						
8:45 AM - 9:45 PM	Plenary Speaker 4: **Anna Mazzucato** *The Pennsylvania State University* Direct and inverse problems for elastic dislocations in geophysics **(Hodges Hall 202)**						
9:45 AM - 10:00 AM	**Coffee Break**						
10:00 AM - 12:00 PM	**Section C1** **Chair: Adrian Tudorascu** **(Hodges Hall 210)**	**Section C2** **Chair: Casian Pantea** **(Hodges Hall 214)**	**Section C3** **Chair: John Holmes** **(Hodges Hall 220)**	**Section C4** **Chair: Maja Taskovic** **(Hodges Hall 301)**	**Section C5** **Chair: Adam Halasz** **(Hodges Hall 308)**		
	Changhui Tan *University of South Carolina* Sticky particle dynamics with alignment interactions	**Michael Aguadze** *Norfolk State University* Using Machine Learning to Measure the Impact of Treatment as a Control for Marijuana Use	**Joseph Paullet** *Penn State Behrend* Generalized Boundary-Layer Flow Due to a Shrinking Permeable Sheet	**Shixu Meng** *Virginia Tech* Exploring Low Rank Structures in Inverse Problems and PDEs	**Stephan Wojtowytsch** *University of Pittsburgh* The 'accelerated Allen-Cahn equation' on Euclidean spaces and in machine learning		
	Boya Liu *North Dakota State University* Recovery of time-dependent coefficients in hyperbolic equations on Riemannian manifolds from partial data	**Gleb Gribovskii** *University of North Carolina at Greensboro* A Game-Theoretic Model of Optimal Condom Usage to Prevent Chlamydia Infections	**Jaffar Ali Shahul Hameed** *Florida Gulf Coast University* Positive Solutions for a Derivative Dependent p-Laplacian Equation with Integral Boundary Conditions	**Jesse Paul** *University of North Carolina at Greensboro* The Monge Ampere Equation and Prescribed Gaussian Curvature: Numerical Methods	**Sanwar Ahmad** *Virginia State University* On accelerating iterative gradient type methods for solving nonlinear optimization problem: application to Electrical Impedance Tomography problems		
	Mohamed El-Houssieny *Detroit Public Schools Community District* Comparison of Adomian Decomposition and Laplace Adomian Decomposition Methods	**Rahnuma Islam** *University of Pittsburgh* Stochastic Immunology model and its analysis	**Wenlong Pei** *The Ohio State University* The variable time-stepping DLN method for fluid models	**Loc Nguyen** *University of Carolina at Charlotte* The Carleman-contraction mapping approach for the inverse scattering problem	**Hamza Adjerid** *Virginia Tech* Nonlinear feedback control for Stokes-type DAEs		
	Vani Cheruvu *The University of Toledo* Haar wavelet based Quasilinearization Method	**Sujan Pant** *Norfolk State University* Understanding the Obesity Epidemic: A Mathematical Model for the Dynamics between Insulin and Glucose	**Adam Pickarski** *North Carolina State University* Large data limits and scaling laws for tSNE	**Matthew Broussard** *North Carolina State University* Analysis and Comparison of Interface Conditions for a Coupling of Poroleastic Equations and Lumped Hydraulic Circuit	**Kanan Gupta** *University of Pittsburgh* Nesterov acceleration despite very noisy gradients		
12:00 PM - 12:30 PM	**Closing Remarks (Hodges Hall 202)**						