Twentieth Annual
Southeastern-Atlantic Regional Conference on
Differential Equations
Virginia Tech, 20-21 October, 2000

Friday

<table>
<thead>
<tr>
<th>Time</th>
<th>Donaldson Brown Hotel (CEC)</th>
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<tbody>
<tr>
<td>1:30– 2:00</td>
<td>Registration Opens</td>
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### Contributed Talks

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Ia</th>
<th>Session Ib</th>
<th>Session Ic</th>
<th>Session Id</th>
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</thead>
<tbody>
<tr>
<td>2:00– 2:20</td>
<td>R.L. Herman</td>
<td>D. Hinton</td>
<td>M. Chhetri</td>
<td>C. Zeng</td>
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<tr>
<td>2:25– 2:45</td>
<td>B.P. Belinsky</td>
<td>K.J. Haertzen</td>
<td>R. Shivaji</td>
<td>R. Weikard</td>
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<tr>
<td>2:50– 3:10</td>
<td>P.F. Dostert</td>
<td>L. Battle</td>
<td>A. Stefanov</td>
<td>A. Savu</td>
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<tr>
<td>3:10– 4:00</td>
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<tr>
<td>4:00– 5:00</td>
<td>Plenary Lecture: Jerry Bona</td>
<td>“Mathematics and Beach Protection”</td>
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Saturday

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<thead>
<tr>
<th>Time</th>
<th>Norris Hall</th>
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<td>8:00– 8:30</td>
<td>Registration Opens</td>
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### Contributed Talks

<table>
<thead>
<tr>
<th>Time</th>
<th>Session IIa</th>
<th>Session IIb</th>
<th>Session IIc</th>
<th>Session IIId</th>
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<tbody>
<tr>
<td>8:30– 8:50</td>
<td>H.R. Joshi</td>
<td>R. Fabiano</td>
<td>A.L. Mazzucato</td>
<td>D.C. Carothers</td>
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<tr>
<td>8:55– 9:15</td>
<td>K.R. Fister</td>
<td>R. Vedantham</td>
<td>C. Cao</td>
<td>M.A. Shubov</td>
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<tr>
<td>9:20– 9:40</td>
<td>C.M. McCarthy</td>
<td>J.R. Gruendler</td>
<td>J. Avrin</td>
<td>M. Stanislavova</td>
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<tr>
<td>10:10–10:30</td>
<td>K. Howard</td>
<td>T. Khan</td>
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<td>T. Dankel</td>
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<tr>
<td>10:30–11:00</td>
<td>Break</td>
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| 11:00–12:00 | Plenary Lecture: Eric Carlen | “Variational Problems in the Wasserstein metric and Kintetic Theory” |
| 12:00– 2:00 | Lunch Break |

| 2:00– 3:00 | Plenary Lecture: James Glimm | “Asymptotic Analysis of Fluid Mixing Equations in the Incompressible Limit” |
| 3:00– 3:30 | Break |

### Contributed Talks

<table>
<thead>
<tr>
<th>Time</th>
<th>Session IIIa</th>
<th>Session IIIb</th>
<th>Session IIIc</th>
<th>Session IIIId</th>
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<tbody>
<tr>
<td>4:20– 4:40</td>
<td>T.C. Gard</td>
<td>L.F. Caudill, Jr.</td>
<td>J. Toloza</td>
<td>M. Bartušek</td>
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<tr>
<td>4:45– 5:05</td>
<td>R.L. Diaz</td>
<td>M.N. Islam</td>
<td>V. Alexiades</td>
<td>Suzanne Lenhart</td>
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<tr>
<td>5:05– 5:30</td>
<td>Discussion - Future Directions in DE Research</td>
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<td>5:30– 2001</td>
<td>Conference Adjourns</td>
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Schedule of Contributed Talks

Session Ia
Chair: Rich Fabiano
Room A
2:00–2:25 Russell L. Herman (University of North Carolina at Wilmington)
   Dynamics, Resonances, and Librational Surfaces of Nonspherical Satellites
2:25–2:50 Boris P. Belinskiy (University of Tennessee at Chattanooga)
   Oscillations of a Rotating String with a Random Frequency
2:50–3:15 Paul F. Dostert (James Madison University & Texas A&M University)
   Numerical Approximations of Large Amplitude Suspension Bridge Oscillations

Session Ib
Chair: Terry Herdman
Alumni Room
2:00–2:25 Don Hinton (University of Tennessee)
   Positive Eigenvalues of Second Order BVP’s and a Theorem of M. G. Krein
2:25–2:50 Kevin J. Haertzen (Northern Illinois University)
   Geometric Aspects of Sturm-Liouville Problems Space of Boundary Conditions for Left-Definiteness
2:50–3:15 Laurie Battle (University of Tennessee)
   Maximum of Green’s Functions for the Sturm-Liouville Problem

Session Ic
Chair: David Gao
Room F
2:00–2:25 Maya Chhetri (The University of North Carolina at Greensboro)
   On Positive Solutions for Classes of p-Laplacian Semipositone Systems
2:25–2:50 Ratnasigham Shivaji (Mississippi State University)
   An Existence Result for a Class of p-Laplacian Equations
2:50–3:15 Atanas Stefanov (University of Massachusetts)
   Optimal Solvability for the Dirichlet and Neumann Problems in Dimension Two

Session Id
Chair: George Hagedorn
Executive Conference Room
2:00–2:25 Chongchun Zeng (University of Virginia)
   Hamiltonian ODEs and PDEs Under Strong Constraints
2:25–2:50 Rudi Weikard (University of Alabama at Birmingham)
   Commuting Differential Operators and Integrable Systems
2:50–3:15 Anamaria Savu (University of Toronto)
   The Kowalevski Top Described as a Hamiltonian System on sp(4)*
Session IIa

Chair: Suzanne Lenhart
Norris 200

8:30–8:55 Hem Raj Joshi (University of Tennessee)
Optimal Control of an HIV Immunology Model

8:55–9:20 K. Renee Fister (Murray State University)
Optimal Control Applied to Cell-Kill Strategies

9:20–9:45 C. Maeve McCarthy (Murray State University)
Optimal Control of a Chemotactic System

9:45–10:10 Junping Shi (College of William and Mary)
Sharp Layer Solutions and Secondary Bifurcations

10:10–10:35 Keith Howard (Kenyon College)
A Model of Cell Dwarfism

Session IIb

Chair: Belinda King
Norris 204

8:30–8:55 Rich Fabiano (University of North Carolina at Greensboro)
Renorming Results for Stability of Functional Differential Equations

8:55–9:20 Ram Vedantham (University of North Carolina at Wilmington)
Optimal Control of Viscous Nonlinear Burgers’ Equation

9:20–9:45 Joseph R. Gruendler (North Carolina A&T State University)
Chaos in Partial Differential Equations Chaotic Oscillations of a Buckled Elastic Beam

9:45–10:10 David Yang Gao (Virginia Tech)
A New Phenomenon in Nonconvex Dynamical Systems and Canonical Dual Control Against Chaos

10:10–10:35 Tauquhar Khan (Clemson University)
Modeling of the ACTEX Structure with Active Materials

Session IIc

Chair: Hyesuk K. Lee
Norris 205

8:30–8:55 Anna L. Mazzucato (Yale University)
“Mild” Solutions to the Navier-Stokes Equation

8:55–9:20 Chongsheng Cao (Los Alamos National Laboratory)
Global Attractor for a Planetary Geostrophic Viscous Model

9:20–9:45 Joel Avrin (University of North Carolina at Charlotte)
Large-Parameter Global Regularity and Attractor Results for the Incompressible Navier-Stokes Equations

9:45–10:10 Victor I. Shubov (Texas Tech University)
Stability of Airflow Containing Fine Dust and Applications to Tornado Dynamics
Session IId

Chair: Lester F. Caudill, Jr.
Norris 207

8:30–8:55 David C. Carothers (James Madison University)
Some Results on Systems of Polynomial Differential Equations and Projectively Polynomial Functions

8:55–9:20 Marianna A. Shubov (Texas Tech University)
Spectral and Asymptotic Analysis of an Aircraft Wing Model

9:20–9:45 Milena Stanislavova (University of Massachusetts)
Spectral Mapping Theorem for the Linearized 2D-Euler Equation

9:45–10:10 K. Ghanbari (Carleton University)
A Note on an Inverse Generalized Eigenvalue Problem

10:10–10:35 Thad Dankel (University of North Carolina at Wilmington)
On Large Space-Time Asymptotics of Solutions to Random Burgers-like Equations Driven by White Noise

Session IIIa

Chair: Renee Fister
Norris 200

3:30–3:55 James F. Selgrade (North Carolina State University)
Nonequilibrium Behavior in Discrete, Selection-Migration Models with Density-Dependent Selection

3:55–4:20 Seth F. Oppenheimer (Mississippi State University)
An Age Structured Insect Model

4:20–4:45 Thomas C. Gard (University of Georgia)
A New Liapunov Function for the Simple Chemostat

4:45–5:10 Ricardo L. Diaz (University of Northern Colorado)
An Application of the Multivariable Hopf-Cole Transformation

Session IIIb

Chair: Jeff Borggaard
Norris 204

3:30–3:55 Hyesuk K. Lee (Clemson University)
Domain Decomposition Methods Based on Optimization

3:55–4:20 Robert Acar (University of Puerto Rico)
Graduated Non-Convexity Type Algorithms for Image Segmentation

4:20–4:45 Lester F. Caudill, Jr. (University of Richmond)
Model for Crack Detection by Thermal Methods

4:45–5:10 Muhammad N. Islam (University of Dayton)
Stability of Perturbed Volterra Equations
Session IIIc

Chair: Rudi Weikard
Norris 205

3:30–3:55 Henry Warchall (National Science Foundation)
Spectral Stability of Encapsulated-Vortex Solutions to Nonlinear Schrödinger Equations

3:55–4:20 George A. Hagedorn (Virginia Tech)
An Exponentially Accurate Time–Dependent Born–Oppenheimer Approximation

4:20–4:45 Julio Toloza (Virginia Tech)
Exponentially Accurate Error Estimates of Quasiclassical Eigenvalues

4:45–5:10 Vasilios Alexiades (University of Tennessee)
Gas Hydrates in Seafloor Sediments

Session IIIId

Chair: Taufiquar Khan
Norris 207

3:30–3:55 John R. Graef (University of Tennessee at Chattanooga)
Some Results on the Asymptotic Decay of Nonoscillatory Solutions of General Nonlinear Difference Equations

3:55–4:20 Youssef N. Raffoul (University of Dayton)
Uniform Asymptotic Stability In Linear Volterra Difference Equations

4:20–4:45 Miroslav Bartušek (Masaryk University)
On Existence of Black Hole Solutions

4:45–5:10 Suzanne Lenhart (University of Tennessee)
Optimal Control of the Obstacle in a Parabolic Variational Inequality