Dynamics Days 2011

30th Annual International Conference on Nonlinear Dynamics

January 5-8, 2011

The Carolina Inn
Chapel Hill, North Carolina

Invited Speakers

Rosalind Allen
Bruno Andreotti
Martine Ben Amar
Andrea Bertozzi
Karen Daniels
Barbara Drossel
Jerry Gollub
Philip Holmes
Edgar Knobloch

Jurgen Kurths
Wolfgang Losert
Amala Mahadevan
Takashi Nishikawa
Corey O'Hern
Ed Ott
Jeffrey Rogers
Leah Shaw
Lawrie Virgin

http://www.math.duke.edu/conferences/DDays2011

Deadlines:

Contributed presentations: November 15, 2010
Conference registration: December 1, 2010
Wednesday, January 5, 2011

8:45 Opening Remarks

9:00 – 10:40 Session 1, Chair: Joshua Socolar, Duke University

9:00 I3 – Statistical Mechanics of Packing: From Proteins to Cells to Grains
Corey O’Hern, Yale University

9:40 I2 – Spatially localized structures in two dimensions
Edgar Knobloch, University of California, Berkeley

10:20 C1 – An Elementary Model of Torus Canards
Anna Barry, Boston University

10:40 BREAK

11:00 – 12:40 Session 2, Chair: Thomas Witelski, Duke University

11:00 I6 – The Path to Fracture: Dynamics of Broken Link Networks in Granular Flows
Wolfgang Losert, University of Maryland

11:40 C2 – Flexibility Increases Energy Efficiency of Digging in Granular Substrates
Dawn Wendell, MIT

12:00 I4 – Ripples, dunes, bars and meanders
Bruno Andreotti, ESPCI

12:40 LUNCH

2:00 – 4:00 Session 3, Chair: Joshua Socolar, Duke University

2:00 I5 – The Nonlinear Population Dynamics of Pacific Salmon
Barbara Drossel, University of Darmstadt

2:40 I8 – Erosional Channelization in Porous Media
Amala Mahadevan, Boston University

3:20 C3 – Determining the onset of chaos in large Boolean networks
Andrew Pomerance, University of Maryland

3:40 C4 – Exploring mesoscopic network structure with communities of links
James Bagrow, Northeastern University

4:00 BREAK

4:20 – 5:20 Session 4, Chair: Thomas Witelski, Duke University

4:20 I7 – Swarming by Nature and by Design
Andrea Bertozzi, UCLA

5:00 C5 – Sub-wavelength position-sensing using a wave chaotic cavity with nonlinear feedback
Hugo Cavalcante, Duke University

5:20 BREAK FOR DINNER

1General Guidelines: Invited presentations are 40 minutes total (35 minutes presentation, 5 minutes questions). Contributed presentations are 20 minutes total (16 minutes presentation, 4 minutes questions), space for poster presentations is limited to a maximum size of 4 feet by 4 feet for each poster.
Thursday, January 6, 2011

9:00 - 9:40 Session 5, Chair: Robert Behringer, Duke University

9:00  I1 – Still Running! Recent Work on the Neuromechanics of Insect Locomotion
      Phillip Holmes, Princeton University

9:40  C6 – Fluid rope tricks
      Stephen Morris, University of Toronto

10:00 C7 – Three-dimensional structure of a sheet crumpled into a sphere
       Anne Dominique Cambou, University of Massachusetts, Amherst

10:20 - 10:40 BREAK

10:40 - 12:00 Session 6, Chair: Edward Ott, University of Maryland

10:40  I9 – Evolutionary Dynamics for Migrating Populations
      Rosalind Allen, University of Edinburgh

11:20  C8 – Predicting criticality and dynamic range in complex networks: effects of topology
      Daniel Larremore, University of Colorado at Boulder

11:40  C10 – Creating Morphable Logic Gates using Logical Stochastic Resonance in an Engineered
       Gene Regulatory Network
      Anna Dari, Arizona State University

12:00 - 2:00 LUNCH

2:00 - 3:40 Session 7, Chair: Brian Utter, James Madison University

2:00  I10 – Stochastic Extinction along an Optimal Path
      Leah Shaw, College of William and Mary

2:40  C9 – Chaos Elimination of Fluctuations in Quantum Tunneling Rates
      Louis Pecora, Naval Research Laboratory

3:00  I14 – Dynamics and Interactions of Swimming Cells
      Jerry Gollub, Haverford College

3:40 – 7:30 BREAK for afternoon and dinner

7:30 - 8:10 Session 8, Chair: Karen Daniels, NCSU

7:30  I12 – Low Dimensional Dynamics in Large Systems of Coupled Oscillators
      Edward Ott, University of Maryland

8:15 -10:00 Poster Session 1 - Setup and Desserts
Friday, January 7, 2011

9:00 – 10:20 Session 9, Chair: Joshua Socolar, Duke University

9:00 I13 – Nonlinear programs and DARPA
Jeffrey Rogers, DARPA

9:40 C11 – Measuring Information Flow in Anticipatory Systems
Shawn Pethel, U.S. Army RDECOM

10:00 C12 – Time delays in the synchronization of chaotic coupled systems with feedback
José Rios Leite, Universidade Federal de Pernambuco

10:20 BREAK

10:40 – 12:20 Session 10, Chair: Thomas Witelski, Duke University

10:40 I11 – Compensatory structures in network synchronization
Takashi Nishikawa, Clarkson University

11:20 C13 – Folding: the nonlinear step in fluid mixing
Douglas Kelley, Yale University

11:40 C14 – Trapping of Swimming Particles in Chaotic Fluid Flow
Nicholas Ouellette, Yale University

12:20 LUNCH

2:00 – 4:00 Session 11, Chair: Joshua Socolar, Duke University

2:00 I15 – Network of Networks and the Climate System
Jurgen Kurths, University of Potsdam

2:40 C15 – What is the front velocity in wave propagation without fronts? Epidemics on complex networks provide an answer
Dirk Brockmann, Northwestern University

3:00 I16 – Shape instability of growing tumors
Martine Ben Amar, University of Paris

3:40 C16 – Reconstruction of Cardiac Action Potential Dynamics using Computer Modeling with Feedback from Experimental Data
Laura Munoz, Cornell University

4:00 – 6:00 Poster Session 2

6:00 BREAK for dinner
Saturday, January 8, 2011

9:30 – 10:30 **Session 12**, Chair: Robert Behringer, Duke University

9:30 **I17** – Faults & Earthquakes as Granular Phenomena: Controls on Stick-Slip Dynamics  
Karen Daniels, North Carolina State University

10:10 **C17** – Effects of Shape on Diffusion  
Rob Shaw, Santa Fe Complex

10:30 BREAK

10:50 – 11:50 **Session 13**, Chair: Robert Behringer, Duke University

10:50 **C18** – Crowd behavior: Synchronization of multistable chaotic systems by a common external force  
Alexander Pisarchik, Centro de Investigaciones en Optica

11:10 **I18** – Rocking and Rolling  
Lawrie Virgin, Duke Univ. Engineering

11:50 **End of Conference. Have a safe trip home!**