

Nonlinear dynamics and stochastic methods: from neuroscience to other biological applications

March 10-12, 2014
University of Pittsburgh - Pittsburgh, PA

Conference Schedule

Venue: O'Hara Student Center (3900 O'Hara Street, Pittsburgh, PA 15260)

Monday March 10th

8:30 AM Breakfast
9:00 AM Opening remarks

Session 1: Reduced neuronal models. Competition models (Chair: Jonathan Rubin)

9:10 – 9:55 AM John Rinzel (New York University)
Biased competition for context-dependent perceptual choice

9:55 – 10:40 AM David Terman (Ohio State University)
What do small toy models tell us about large complicated networks?

10:40 – 11:00 AM Coffee break

Session 2: Pattern formation in cell biology (Chair: Angela Reynolds)

11:00 – 11:45 AM Leah Edelstein-Keshet (University of British Columbia)
From actin assembly to cell motility, with a little help from my friend

11:45 AM – 12:30 PM Lance Davidson (University of Pittsburgh, Bioengineering)
Engines of cell shape change: actomyosin dynamics within the cell cortex

~ Lunch break ~

Session 3: Mathematical methods and applications to biology (Chair: Boris Gutkin)

2:30 – 3:15 PM Cheng Ly (Virginia Commonwealth University)
Networks of heterogeneous neural oscillators

3:15 – 4:00 PM Sharon Crook (Arizona State University)
A continuum model approach for exploring the role of neuronal structure

4:00 – 4:45 PM Pranay Goel (Indian Institute of Science, Education and Research, Pune- India)
Using the Dual Oscillator Model (DOM) to study bursting in pancreatic islets

5:15 – 7:15 PM Poster Session with light refreshments
(University Club, 123 University Place)

Tuesday March 11th

9:00 AM Breakfast

Session 4: Geometrical methods. Systems with multiple timescales (Chair: Rodica Curtu)

9:20 – 10:05 AM Jonathan Rubin (University of Pittsburgh)
...and Out Come the Boundary Conditions

10:05 – 10:50 AM Paul Bressloff (University of Utah)
Breakdown of fast-slow analysis in an excitable neuron with channel noise

10:50 – 11:10 AM Coffee break

Session 5: Role of variability in shaping the output of the neural system (Chair: Zack Kilpatrick)

11:10 – 11:55 AM Carson Chow (National Institutes of Health)
How many neurons code a percept?

11:55 AM – 12:40 PM Remus Osan (Georgia State University)
Targeting performances for stochastic models of neural growth with uniform branching and pruning

~ Lunch break ~

Session 6: Experimental methods, data analysis and modeling techniques (Chair: Brent Doiron)

2:30 – 3:15 PM Roberto Fernandez Galan (Case Western Reserve University)
Stochastic neural dynamics and information processing in the autistic brain

3:15 – 4:00 PM Daniel Simons (University of Pittsburgh, Neurobiology)
Receptive field transformations in feedforward thalamocortical circuits

4:00 – 4:45 PM Jonathan Drover (Cornell Medical College)
A mean-field model suggests a novel EEG analysis technique to index thalamocortical dynamics

6:00 – 8:30 PM Banquet
(Frick Fine Arts Bldg)

Wednesday March 12th

9:00 AM Breakfast

Session 7: Brain rhythms and cognition (Chair: Remus Osan)

9:20 – 10:05 AM Nancy Kopell (Boston University)
Brain rhythms: multiple roles of inhibition

10:05 – 10:50 AM Boris Gutkin (Ecole Normale Superieure, Paris - France)
Working with Gamma, Theta, Alpha oscillations (and noise correlations) to make working memory work

10:50 – 11:10 AM Coffee break

Session 8: Pattern formation in neural systems (Chair: Carson Chow)

11:10 – 11:55 AM Zachary Kilpatrick (University of Houston)
Getting the most out of bumps

11:55 AM – 12:40 PM Jack Cowan (University of Chicago)
Geometric Visual Hallucinations: what they tell us about the architecture of the brain

12:40 – 12:55 PM Closing remarks

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