

Dynamics of Bursting Activity of Neurons

Place: Brown Room on the 18th floor of The Commerce Club, 34 Broad St, Atlanta

Sponsored by The Center for Behavioral Neuroscience, The Neuroscience Institute and The Dept. of Physics and Astronomy,

Georgia State University

April 16

8:00 - 8:45 Registration and Breakfast
8:45 - 8:50 Gennady Cymbalyuk: *Opening Remarks*
8:50 - 9:00 Walter Wilczynski, Director of the Neuroscience Institute, GSU: *Welcoming Address*

Session 1 Chair: Andrey Shilnikov

9:00 - 9:45 Jeff Smith: *Multiple modes and mechanisms of rhythmic burst pattern generation in brainstem respiratory networks*

9:45 - 10:15 Illya Rybak: *Late-Expiratory Oscillations in RTN/pFRG: Emergence and Coupling with Respiratory CPG*

10:15 - 10:45 Rhonda Dzakpasu: *Modulating the ratio between excitatory and inhibitory neurons in in vitro neural networks*

10:45 - 11:05 Coffee Break

Session 2 Chair: Gennady Cymbalyuk

11:05 - 11:50 Nino Ramirez: *Neuromodulation and bursting gone mad: Insights gained from studying neurological disorders*

11:50 - 12:20 Andrew Tryba: *TRP-ing over your next breath and enhancing neocortical oscillations*

12:20 - 13:20 Lunch

Session 3 Chair: Robert Clewley

13:20 - 13:50 Dieter Jaeger: *Pathological bursting in basal ganglia circuits in Parkinson's disease*

13:50 - 14:20 Ari Berkowitz: *Multifunctional and specialized spinal interneurons for several kinds of limb movements*

14:20 - 14:50 Donald Edwards: *Neuromechanical analysis of posture and locomotion in crayfish*

14:50 - 15:10 Coffee Break

Session 4 Chair: Mukesh Dhamala

15:10 - 15:40 Joel Tabak: *The unusual bursting pattern produced by pituitary cells*

15:40 - 16:10 Robert Butera: *Voltage-dependent and Voltage-independent pacemakers in the pre-Botzinger Complex: An Integrative Model*

16:10 - 16:30 Andrey Shilnikov: *Polyrhythms of bursting patterns in deterministic models for central pattern generators*

16:30 - 16:45 Coffee Break

Session 5 Chair: Peter Rowat

16:45 - 17:15 Michael Sorensen: *Accelerating simulations of bursting neurons with simEngine*

17:15 - 17:45 David Mogul: *Multisite phase synchrony during chemically-induced seizures in rat brain*

17:45 - 18:05 Igor Belykh: *Inhibitory synchronization in bursting networks*

18:05 - 20:00 Reception-Dinner

19:00 - 21:30 Poster session

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April 17

8:00 - 8:55 Breakfast
8:55 - 9:00 Gennady Cymbalyuk: *Opening remarks*

Session 6 Chair: Sonya Bahar

9:00 - 9:45 Roger Traub: *Some normal and abnormal collective phenomena in cortical circuits amongst bursting neurons*

9:45 - 10:15 Daniel Wagenaar: *Bursting with desire: a two-timescale rhythm for mate exploration in the medicinal leech*

10:15 - 10:45 Ronald Calabrese: *Given biological variation, how should we model small rhythmic networks?*

10:45 - 11:05 Coffee Break

Session 7 Chair: Ronald Calabrese

11:05 - 11:35 Ayako Yamaguchi: *NMDAR-dependent control of call duration in *Xenopus laevis**

11:35 - 12:05 Paul Katz: *Biological Evolution of central pattern generators*

12:05 - 13:05 Lunch

Session 8 Chair: Vladimir Bondarenko

13:05 - 13:35 Maxim Volgushev: *UP and DOWN states in neocortical neurons during slow wave oscillations*

13:35 - 14:05 Maxim Bazhenov: *Network bistability mediates spontaneous transitions between normal and pathological brain states*

14:05 - 14:35 Ernest Barreto: *Ion concentrations and seizure dynamics*

14:35 - 14:55 Coffee Break

Session 9 Chair: Igor Belykh

14:55 - 15:25 Sonya Bahar: *Synchronization of Neural Activity during Focal Neocortical Seizures*

15:25 - 15:55 Robert Gross: *'Filling-In-The-Blanks': Therapeutic Stimulation of the Nervous System for Disorders Involving Abnormal Burst Firing*

15:55 - 16:25 Leonid Bunimovich: *Isospectral reduction of networks and spectral networks' equivalence*

16:25 - 16:40 Coffee Break

Session 10 Chair: Maxim Bazhenov

16:40 - 17:10 Arnold Mandell: *Strudels: Intermittent MEG Sensor Field Correlates of the Inattentive Mind*

17:10 - 17:30 Mukesh Dhamala: *Synchronization of Time-Delayed Coupled Bursting Neurons*

17:30 - 17:50 Robert Clewley: *Reducing the fine structure of bursting dynamics*

17:50 - 18:10 Gennady Cymbalyuk: *Co-existence of epileptiform bursting and silent regimes in neuronal dynamics*

18:10 - 19:00 Round table

Poster Session

P1	William Barnett , Martin Anquez, Gennady Cymbalyuk <i>Pattern scaling in neuronal dynamics</i>
P2	Vladimir E. Bondarenko and Andrey L. Shilnikov <i>Autonomous spiking and bursting in a mouse ventricular cell model</i>
P3	Mirza Dobric and Robert Clewley <i>Multi-modal optimization techniques for biophysical neuron models.</i>
P4	Anca Doloc-Mihu and Ronald Calabrese <i>Analyzing how varying neuronal parameters influence network activity using a database of computational models of a half-center oscillator</i>
P5	Gregory Filatov and Maxim Bazhenov <i>Role of Extracellular K^+ Dynamics in Network Synchronization.</i>
P6	Sajjya Jalil , Andrey Shilnikov, Igor Belykh <i>Synchronization in a bursting half-center oscillator with slow-to-fast reciprocal inhibition.</i>
P7	Alexander N. Klishko and Boris I. Prilutsky <i>Firing rates of cat muscle Ia, Ib, II and paw cutaneous afferents during walking computed using a musculoskeletal hindlimb model</i>
P8	Alexey Kuznetsov <i>Mechanisms of frequency control in the midbrain dopaminergic neuron.</i>
P9	Giri P Krishnan and Maxim Bazhenov <i>Modulation of bursting and tonic activity during seizure by ion concentrations explains spontaneous seizure termination.</i>
P10	Tatiana Malaschenko and Gennady Cymbalyuk <i>Good currents playing bad: propensity to bi-stability in neuronal dynamics</i>
P11	Peter Rowat <i>"Distribution of Burst Length and Inter-Burst-Interval of the stochastic Morris-Lecar Neuron"</i>
P12	Wondimu Teka <i>From Plateau to Pseudo-Plateau Bursting: Making the Transition.</i>
P13	Wafa Soofi <i>Covarying ionic conductances to emulate phase maintenance in stomatogastric neurons</i>
P14	David Qian , Gennady Cymbalyuk and Bill Walthall <i>Deviations from the straight and narrow: C. elegans uncoordinated mutants that Circle.</i>
P15	Yaroslav I. Molkov , Jonathan E. Rubin, Bartholomew J. Bacak, Natalia A. Shevtsova, Jeffrey C. Smith and Ilya A. Rybak <i>Modeling State-Dependent Interactions between BötC/pre-BötC and RTN/pFRG oscillations</i>
P16	Jeremy Wojcik and Andrey Shilnikov <i>Poincare Mappings for Models of Elliptic Bursters</i>
P17	Xiaoli Zhang , Junda Su, Ningren Cui, Hongyu Gai, Zhongying Wu and Chun Jiang <i>The breathing disorders of a mouse model of Rett syndrome are linked to defects in central CO₂ chemosensitivity of locus coeruleus neurons</i>
P18	Yang Yang , Weiwei Shi, Ningren Cui, Xianfeng Chen, T. Trower, and Chun Jiang <i>Reactive oxygen species (ROS) inhibit KATP channel via S-glutathionylation.</i>
P19	Cengiz Gunay , Fred Sieling, Logesh Dharmar and Astrid Prinz <i>Characterizing change in activity patterns in a Drosophila motoneuron with different sodium channel splice variants.</i>