LEONID L. RUBCHINSKY

Curriculum Vitae

PERSONAL INFORMATION

Business address	Center for Neuroscience University of California, Davis 1544 Newton Ct. Davis, CA 95616	lrubchinsky@ucdavis.edu (530) 752-5304 (office) (530) 757-8827 (fax) (530) 754-5022 (lab)
Home address	931 J St., #74 Davis, CA 95616	(530) 758-1878
Birth date	November 17, 1974	
Citizenship	Russian (US permanent residency is approved)	

EDUCATION

Degrees earned

Ph.D., Physics	Institute for Applied Physics, Russian Academy of Science, Nizhny Novgorod, Russia, 2000
M.S., Physics	University of California, San Diego, 1997
B.S., Physics	University of Nizhny Novgorod, Russia, 1995

Non-degree courses

Workshop on Dynamics of Neural Networks: From Biophysics to Behavior.	University of California, Santa Barbara, 2001
Workshop on Dynamical Systems	International Center for Theoretical Physics, Italy, 1998

EMPLOYMENT

2003 - present	Consulting Electrophysiologist for Functional Neurosurgery Kaiser Permanente Medical Group, Sacramento, CA
2001 - present	Postdoctoral Research Fellow University of California, Davis
1999 - 2000	Lecturer University of Nizhny Novgorod, Nizhny Novgorod, Russia
1997 – 2001	Junior Research Associate Institute for Applied Physics, Russian Academy of Science
1995 - 1997	Research Assistant, Teaching Assistant University of California, San Diego
1994-1995	Research Assistant Institute for Applied Physics, Russian Academy of Science

RESEARCH INTERESTS

Biomathematics and nonlinear dynamics: dynamics of coupled oscillators and neuronal assemblies, synchronization and information processing in neural systems, models and data analysis

TEACHING AND MENTORING EXPERIENCE

2003	University of California, Davis Supervised student research assistant
1999	University of Nizhny Novgorod, Nizhny Novgorod, Russia Taught an introductory course on nonlinear dynamics of neural networks for physics graduate students
1996-1997	University of California, San Diego Teaching assistant (problem solving and discussion sessions) in upper-division (theoretical mechanics) and lower-division (physics for science and engineering majors and physics for non-science majors) courses

PROFESSIONAL ACTIVITIES AND SERVICE

Professional society membership

Society for Neuroscience (2002)
American Physical Society (1995)

Manuscript referee for

Physical Review Letters
Physical Review E
Journal of Computational Neuroscience
Journal of Neurophysiology

Committees

Young Scientists Council (Institute for Applied physics, Russian Academy of Science, 2000-2001)

AWARDS AND FELLOWSHIPS

Open Society Institute Grant (2000)
Razuvaev Fellowship of Nizhny Novgorod Region Administration (1998, 1999)
Soros International Science Educational Program Fellowships (1995, 1998-2000)
The Russian Presidential Fellowship (1995)

CONFERENCE PRESENTATIONS

Society for Neuroscience 33rd Annual Meeting, New Orlean, 2003 (poster)

Workshop on the Sensory-Motor System, Mathematical Biosciences Institute, Ohio State University, Columbus, 2003 (oral).

7th Int. Conference on Cognitive and Neural Systems, Boston University, 2003 (oral).

Int. Symposium on Nonlinear Theory and Its Applications. Dresden, Germany, 2000 (oral).

IEEE – IUTAM Int. Conference "Control of Oscillations and Chaos". St. Petersburg, Russia, 2000 (poster).

VII Int. School-Seminar "Wave Phenomena in Inhomogeneous Media". Krasnovidovo, Russia, 2000 (oral).

V Int. Conference "Nonlinear Oscillations in Mechanical Systems". Nizhny Novgorod, Russia, 1999 (poster).

Int. Conference "Stochaos: Stochastic and Chaotic Dynamics in the Lakes". Ambleside, UK, 1999 (poster).

4th Session of Young Scientists, Nizhny Novgorod, Russia, 1999 (oral).

5th Int. School on Chaotic Oscillations and Pattern Formation CHAOS'98. Saratov, Russia, 1998 (oral).

Int. Workshop on Synchronization, Pattern Formation and Spatio-Temporal Chaos in Coupled Chaotic Oscillators. Santiago de Compostela, Spain, 1998 (oral).

Int. Conference "Dynamics Days in Nizhny Novgorod", Russia, 1998 (oral).

VI School-Seminar "Wave Phenomena in Inhomogeneous Media". Krasnovidovo, Russia, 1998 (oral).

3rd Session of Young Scientists, Nizhny Novgorod, Russia, 1998 (oral).

Workshop "Dynamics Days". Houston, Texas, January 1996 (poster).

Int. Conference on Complex Dynamics in Chemistry and Biology. Odense, Denmark, 1995 (poster).

Int. Conference "Criteria of self-organization in physical, chemical and biological systems". Moscow - Suzdal, Russia, 1995 (poster).

PUBLICATIONS

Manuscripts in preparation

J.M. Hurtado, L.L. Rubchinsky, V.L. Wheelock, C.T.E. Pappas, K.A. Sigvardt. Intermittent synchronization between pallidum and parkinsonian tremor.

L.L. Rubchinsky, A. Ray, V.L. Wheelock, C.T.E. Pappas, K.A. Sigvardt. Comparison of Globus Pallidus activity in parkinsonian patients undergoing first and second pallidal surgery.

Submitted manuscripts

J.M. Hurtado, L.L. Rubchinsky, K.A. Sigvardt. Detection of phase locking episodes in neural oscillations by a statistical method. Submitted to *J. Neurophys.*, 2003.

Papers in peer reviewed journals

L.L. Rubchinsky, N. Kopell, K.A. Sigvardt. Modeling facilitation and inhibition of competing motor programs in basal ganglia subthalamic nucleus - pallidal circuits. *Proc. Nat. Acad. Sci. USA* **100**: 14427-14432, 2003.

L.L. Rubchinsky, M.M. Sushchik, G.V. Osipov. Patterns in networks of oscillators formed via synchronization and oscillator death. *Mathematics and Computers in Simulation* **58**: 443-467, 2002.

L. Rubchinsky, M. Sushchik. Disorder can eliminate oscillator death. *Physical Review E* **62**: 6440-6446, 2000.

L. Rubchinsky, M. Sushchik. Anomalous relationship between spatial and temporal patterns of dynamical behavior. *Int. J. Bifurcation and Chaos* **9**: 2329-2334, 1999.

L.L. Rubchinskii, M.M. Sushchik. Direct and reverse relationship between disordered spatial and temporal patterns in arrays of chaotic oscillators. *Izv. VUZov Prikladnaya Nelineinaya Dinamika* **7**: 81-87, 1999. In Russian.

H.D.I. Abarbanel, M.I. Rabinovich, A. Selverston, M.V. Bazhenov, R. Huerta, M.M. Sushchik, L.L. Rubchinskii. Synchronization in neural networks. *Physics-Uspekhi* **39**: 337-362, 1996.

M. Rabinovich, A. Selverston, L. Rubchinsky, R. Huerta. Dynamics and kinematics of simple neural systems. *Chaos* **6**: 288-296, 1996.

M. Bazhenov, M. Rabinovich, L. Rubchinsky. Time-periodic spatial chaos in the complex Ginzburg-Landau equation. *J. Stat. Phys.* **83**: 1165-1181, 1996.

M.V. Bazhenov, M.I. Rabinovich, L.L. Rubchinsky. Simple neuronal model with complex oscillatory activity. *Izv. VUZov Prikladnaya Nelineinaya Dinamika* **4:** 33-39, 1996. In Russian.

M.V. Bazhenov, M.I. Rabinovich, L.L. Rubchinskii. Periodic evolution of space chaos in the one-dimensional complex Ginzburg-Landau equation. *Radiophysics and Quantum Electronics* **38:** 25-29, 1995.

Papers in conference proceedings and book chapters

L.L. Rubchinsky, G.V. Osipov, M.M. Sushchik. Intermittent front propagation in arrays of bistable oscillators. In *Proc. Int. Symposium on Nonlinear Theory and Its Applications*. Dresden, Germany, v. 1, 273-276, 2000.

L. Rubchinsky, M. Sushchik. The action of disorder on oscillator death. In *Proc. 2nd IEEE – IUTAM Int. Conference "Control of Oscillations and Chaos"*. Ed. by F.L. Chernousko and A.L. Fradkov. Piscataway, NJ: IEEE, v. 1, 181-182, 2000.

M.M. Sushchik, G.V. Osipov, L.L. Rubchinsky. Intermittency in transitions from non-propagation to propagation in bistable active media. In *Proc. VII School-Seminar "Wave Phenomena in Inhomogeneous Media"*. Krasnovidovo, Russia, v. 1, 19-20, 2000.

L.L. Rubchinsky, M.M. Sushchik. The influence of disorder on oscillator death in inhomogeneous arrays of self-oscillators. In *Proc. VII School-Seminar "Wave Phenomena in Inhomogeneous Media"*. Krasnovidovo, Russia, v. 1, 20-22, 2000.

L. Rubchinsky, M. Sushchik. The influence of disorder on oscillator death in smoothly inhomogeneous arrays of oscillators. In *Stochaos: Stochastic and Chaotic Dynamics in the Lakes*. Ed. by D.S. Broomhead, E.A. Luchinskaya, P.V.E. McClintock., T. Mullin. Woodbury, NY: American Institute of Physics, 567-572, 2000.

G. Osipov, L. Rubchinsky, M. Sushchik. Controlled formation of synchronized clusters in arrays of diffusively coupled Van der Pol oscillators. In *Proc. Int. Symposium on Nonlinear Theory and Its Applications*. Crans-Montana, Switzerland, v. 2, 531-534, 1998.

L. Rubchinsky, M. Sushchik, Anomalous relationship between spatial and temporal patterns of behavior in homogeneous nonlinear nonequilibrium media. In *Proc. Int. Symposium on Nonlinear Theory and Its Applications*. Crans-Montana, Switzerland, v. 1, 307-310, 1998.

L.L. Rubchinsky, M.M. Sushchik. Synchronized clusters and their control in the chains of self-oscillators with inhomogeneous distribution of natural frequencies. In *Proc. VI School-Seminar "Wave Phenomena in Inhomogeneous Media"*. Krasnovidovo, Russia, 62, 1998.

M. Bazhenov, M. Rabinovich, L. Rubchinsky. An oscillatory neural network unit model. In *Chaotic, Fractal, and Nonlinear Signal Processing*. Ed. R.A. Katz. American Institute of Physics, 726-733, 1996.

M. Bazhenov, M. Rabinovich, L. Rubchinsky. Time periodic spatial disorder in a complex Ginzburg-Landau equation. In *Chaotic, Fractal, and Nonlinear Signal Processing.* Ed. R.A. Katz. American Institute of Physics, 533-540, 1996.

M. Bazhenov, M. Rabinovich, L. Rubchinsky. A model for neural network with complex oscillatory activity. In *Proc. 1995 Int. Symposium on Nonlinear Theory and Its Applications.* Las Vegas, NV, v. 2, 1045-1048, 1995.

Recent abstracts

L.L. Rubchinsky, N. Kopell, K.A. Sigvardt. Selection and inhibition of competing motor programs in subthalamic and pallidal circuits of basal ganglia. Computational study. Society for neuroscience annual meeting, 915.6, New Orlean, 2003.

J.M. Hurtado, L.L. Rubchinsky, K.A. Sigvardt. Statistical method based on Hilbert phase to detect transient phase locking and unlocking in neuronal oscillations. Society for neuroscience annual meeting, 403.5, New Orlean, 2003.

L.L. Rubchinsky, N. Kopell, K.A. Sigvardt. Modeling facilitation and inhibition of competing motor programs in GPe-STN-GPi circuits of basal ganglia. Sensory-Motor Workshop, Mathematical Biosciences Institute, Ohio State University, Columbus, 2003.

L.L. Rubchinsky, N. Kopell, K.A. Sigvardt. Model of basal ganglia motor control network and its dysfunction in Parkinson's disease. Proc. 7th Int. Conference on Cognitive and Neural Systems, p. 63, Boston University, 2003.

Ph.D. Thesis

Spatially inhomogeneous regular and chaotic dynamics of networks of self-oscillators. Institute for Applied Physics, Russian Academy of Science, 2000.