

CARINA PAMELA CURTO

Department of Mathematics
Courant Institute of Mathematical Sciences
New York University
251 Mercer Street
New York, NY 10012-1185

tel: 212-998-3336
email: curto@courant.nyu.edu
website: <http://math.nyu.edu/~curto/>

Research Interests Theoretical and Computational Neuroscience, Systems Neuroscience. Application of ideas and techniques from geometry, topology, and analysis to investigate neural circuits and neural coding problems. Analysis of experimental data and neural network models.

Education & Employment **University of Nebraska-Lincoln** Lincoln, NE
Assistant Professor (Mathematics) Aug 2009–

Courant Institute, New York University New York, NY
Courant Instructor (Mathematics) Sep 2008–Aug 2009

Rutgers, The State University of New Jersey Newark, NJ
Center for Molecular and Behavioral Neuroscience May 2005–Aug 2008
Postdoctoral Associate (Neuroscience) in the lab of Prof. Kenneth D. Harris

Duke University Durham, NC
Ph.D. in Mathematics (Algebraic Geometry & String Theory) Aug 2000–May 2005
advisor: Prof. David R. Morrison

Harvard University Cambridge, MA
B.A. in Physics (Cum Laude) Sep 1996–Jun 2000

West High School Iowa City, IA
Valedictorian Aug 1992–Jun 1996

Grants NSF DMS-0920845 (PI) 2009-2012

& Awards *Stimulus representation and spontaneous activity in recurrent networks.*
NSF VIGRE Graduate Fellowship 2004–05
NSF Graduate Research Fellowship 2000–04
James B. Duke Fellowship, Duke University 2000–03
Duke Endowment Fellowship, Duke University 2001–04
University Scholars Program Fellowship, Duke University 2000–01
Mellon Mays Undergraduate Fellowship, Harvard University 1997–2000
American Physical Society Scholarship 1996–98
Detur Prize, Harvard University 1997

Publications[†] **C. Curto, S. Sakata, S. Marguet, V. Itskov, K.D. Harris.** A simple model of cortical dynamics explains variability and state-dependence of sensory responses in urethane-anesthetized auditory cortex. **Journal of Neuroscience**, 2009, *in press*.

P. Bartho, **C. Curto**, A. Luczak, S. Marguet, K.D. Harris. Population coding of tone stimuli in auditory cortex: dynamic rate vector analysis. *Under second round of review in European Journal of Neuroscience*.

C. Curto*, V. Itskov* (**equal contribution*). Cell groups reveal structure of stimulus space. **PLoS Computational Biology**, Vol. 4(10): e1000205, 2008.

V. Itskov, **C. Curto**, K.D. Harris. Valuations for spike train prediction. **Neural Computation**, Vol. 20(3), 2008, pp. 644-667.

C. Curto, D.R. Morrison. Threefold flops via matrix factorizations. *Under second round of review in Journal of Algebraic Geometry*.

C. Curto. Matrix model superpotentials and ADE singularities. **Advances in Theoretical and Mathematical Physics**, Vol. 12 (2), 2008, pp. 357-409.

C. Curto. Matrix Model Superpotentials and Calabi-Yau Spaces: an ADE Classification. **PhD thesis**, 2005. arxiv.org/math.AG/0505111

C. A. Kletzing, J. D. Scudder, E. E. Dors, and **C. Curto**. The auroral source region: plasma properties of the high altitude plasma sheet. **Journal of Geophysical Research**, 108(A10), 1360, 2003.

C. Curto, S.J. Gates, V.G.J. Rodgers, Superspace Geometrical Realization of the N-Extended Super Virasoro Algebra and its Dual. **Physics Letters B** 480, 2000, pp. 337-347.

† *Most manuscripts are available at <http://math.nyu.edu/~curto/papers/>.*

Selected Posters

COSYNE Annual Meeting, Salt Lake City UT	Feb 2009
<i>Control of single neuron activity by sensory stimuli and global network dynamics in auditory cortex</i>	
Society for Neuroscience Annual Meeting, Washington DC	Nov 2008
<i>Control of single neuron activity by sensory stimuli and global network dynamics in auditory cortex</i>	
Society for Neuroscience Annual Meeting, San Diego CA	Nov 2007
<i>State-dependence of sensory-evoked responses in neocortex</i>	
COSYNE Annual Meeting, Salt Lake City UT	Feb 2007
<i>State-dependence of sensory-evoked responses in neocortex</i>	
Society for Neuroscience Annual Meeting, Atlanta GA	Oct 2006
<i>Dynamics of activated and inactivated states in neocortex</i>	
Society for Neuroscience Annual Meeting, Washington DC	Nov 2005
<i>Laminar organization of sensory-evoked activity in neocortex</i>	

Talks

Institute of Advanced Study, Princeton	Apr 2009
<i>Workshop on Topology: Identifying Order in Complex Systems</i>	
University of Utah, Mathematical Biology Seminar	Mar —
COSYNE Annual Meeting, Salt Lake City, UT	Mar —
<i>Workshop: Stochastic methods for the analyses of spike train and field potential data</i>	
UC Berkeley, Mathematical & Computational Biology Seminar	Feb —
Temple University, Mathematics Colloquium (job talk)	Feb —
Notre Dame, Mathematics Colloquium (job talk)	Feb —
Michigan State University, Mathematics Colloquium (job talk)	Jan —
Ohio State University, Mathematics Seminar (job talk)	Jan —
University of Nebraska-Lincoln, Mathematics Colloquium (job talk)	Jan —
North Carolina State University, Mathematics Colloquium (job talk)	Jan —
Georgia Tech, Math Biology Seminar (job talk)	Jan —
New York University, Applied Math Lab Seminar	Nov 2008
New York University, Courant Instructor Day	Sep —
Columbia Center for Theoretical Neuroscience	Apr —

	NJIT Mathematical Biology Seminar	Apr —
	IBM Computational Biology Research Group, New York	Feb —
	New York University, Mostly Biomathematics Seminar	Feb —
	Rutgers University, Mathematical Biology Seminar, New Brunswick	Dec 2007
	New York University, Mostly Biomathematics Seminar	Nov —
	Applications of Analysis to Mathematical Biology, Duke University	May —
	CMBN Student-Postdoc seminar, Rutgers, Newark	Mar —
	CMBN Student-Postdoc seminar, Rutgers, Newark	May 2006
	CNS Annual Meeting: Workshop on Oscillations and Networks, Madison, WI	Jul 2005
	Theoretical Physics Session, NSBP/NSHP Joint Meeting	Feb —
	University of Iowa, Particle Physics Seminar	Dec 2004
	University of Wisconsin, Madison, Topology Seminar	Dec —
	Duke University, String Theory Seminar	Oct —
	Duke University, Toric Geometry Seminar	Apr —
	Duke University, CGTP Seminar	Dec 2003
	Duke University, Graduate/Faculty Seminar	Feb —
	Duke University, Nuclear Particle Theory Seminar	Mar 2002
Teaching Experience	Courant Instructor (lecturer), New York University Math V122: Calculus II	Fall 2008
	Unofficial Lecturer , CMBN, Rutgers University Linear Algebra for Neuroscientists Designed and taught a course for grad students and postdocs in neuroscience. Topics included SVD, PCA, MDA and Fourier analysis.	Jun 2005– May 2006
	Graduate Student Instructor (lecturer), Duke University Math 103: Multivariable Calculus Math 32: Calculus II	Spring 2003 Fall 2002
	Tutor , Harvard University Graph Theory & Combinatorics	Spring 2000
	Course Assistant (recitation, office hours, grading), Harvard University Math 21b: Linear Algebra Math 21a: Vector Calculus Math 1b: Calculus II	Fall 1998 Spring 1998 Fall 1997
Summer Schools	MBL Neuroinformatics Course, Woods Hole, MA IAS Prospects in Theoretical Physics, Princeton IAS Women's Program in Symplectic Geometry, Princeton IAS Park City Math Institute, Park City, Utah <i>Supersymmetry, Quantum Field Theory & Enumerative Geometry</i> IAS Women's Program in Mathematical Physics, Princeton Budapest Semesters in Mathematics, Hungary University of Iowa Summer French Program in Lyon, France	Aug 2006 Jun 2002 May 2002 Jul 2001 May 2001 Spring 1999 Summer 1996
Languages	Matlab, Maple, IDL, C. English (native), Spanish (native), French (fluent), Russian (basic), and Italian (basic).	