

# Stanislav M. Mintchev

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- Education**
- SEPTEMBER 2002 – AUGUST 2008: Ph.D. (2008), M.S. (2006), Mathematics.  
*Institution:* Courant Institute of Mathematical Sciences, New York University (NYU).  
*Doctoral Thesis:* Self-Organization Phenomena in Networks of Pulse-Coupled Phase Oscillators.  
*Advisor:* Prof. Lai-Sang Young, Dynamical Systems.
  - SEPTEMBER 1998 – MAY 2002: BS Physics, BS Mathematics. Majors with special honors.  
*Institution:* The George Washington University (GWU), Washington, DC.  
*Undergraduate Honors Thesis:* Continued Fraction Expansions and Self-similarity of Irrational Rotations, directed by Prof. E.A. Robinson, Jr.

- Academic Positions**
- SEPTEMBER 2016 – PRESENT: Associate Professor of Mathematics  
*Institution:* The Cooper Union for the Advancement of Science and Art, New York, NY.
  - SEPTEMBER 2010 – AUGUST 2016: Assistant Professor of Mathematics  
*Institution:* The Cooper Union for the Advancement of Science and Art, New York, NY.
  - SEPTEMBER 2008 – AUGUST 2010: Visiting Assistant Professor of Mathematics  
*Institution:* The Cooper Union for the Advancement of Science and Art, New York, NY.

- Prepared to Teach**
- Ordinary and Partial Differential Equations, Numerical Analysis and Scientific Computing, Linear Algebra, Introductory and Vector Calculus, Probability, Discrete Mathematics, Topology, Advanced Calculus, Real and Complex Analysis, Abstract Algebra.

- Teaching Experience**
- THE COOPER UNION (AS ASSOCIATE PROFESSOR)  
FALL 2016: Linear Algebra; Calculus I; Introduction to Linear Algebra.
  - THE COOPER UNION (AS ASSISTANT PROFESSOR)  
SPRING 2016: Calculus II; Differential Equations.  
FALL 2015: Linear Algebra; Calculus I; Introduction to Linear Algebra; *Independent Study:* Point-set Topology.  
SPRING 2015: Calculus II; Differential Equations; *Independent Study:* Algebraic Topology.  
FALL 2014: Linear Algebra; Calculus I; Introduction to Linear Algebra; *Independent Study:* Point-set Topology.  
SPRING 2014: Calculus II; Probability; *Independent Study:* Algebraic Topology.  
FALL 2013: Linear Algebra; Calculus I; Introduction to Linear Algebra; *Independent Study:* Point-set Topology.  
SPRING 2013: Numerical Analysis (graduate); Differential Equations; *Independent Study:* Dynamical Systems and Chaos.

FALL 2012: Linear Algebra; Calculus I; Introduction to Linear Algebra.

SPRING 2012: Linear Algebra; Differential Equations.

FALL 2011: Calculus I; Introduction to Linear Algebra; Probability.

SPRING 2011: Calculus II; *Independent Study*: Algebraic Topology.

FALL 2010: Calculus I; Introduction to Linear Algebra; Differential Equations; *Independent Study*: Point-set Topology.

- THE COOPER UNION (AS VISITING ASSISTANT PROFESSOR)

SPRING 2010: Calculus II; Vector Calculus.

FALL 2009: Calculus I; Introduction to Linear Algebra.

SPRING 2009: Vector Calculus; Differential Equations.

FALL 2008: Calculus I; Introduction to Linear Algebra.

SPRING 2008: Calculus I.

- NEW YORK UNIVERSITY (COURSE INSTRUCTOR AND TEACHING ASSISTANT)

FALL 2007 AND SPRING 2008: Course Instructor, Algebra and Calculus (Precalculus). Lecture with enrollment of 120 students; management of 3 teaching assistants.

SUMMER 2007: Course Instructor, Calculus I.

SPRING 2007: Calculus Placement Test Design. Design of a multiple-choice based placement test, to be given to entering undergraduates wishing to enroll into the introductory calculus sequence.

FALL 2006: Course Instructor, Linear Algebra.

SPRING 2006 AND FALL 2005: Course Instructor, Calculus III.

SPRING 2005: Course Instructor, Calculus II.

FALL 2004: Teaching Assistant, Ordinary Differential Equations.

FALL 2003, SPRING 2003, AND FALL 2002: Teaching Assistant, Calculus for Social and Management Sciences.

- GEORGE WASHINGTON UNIVERSITY (TEACHING ASSISTANT)

SPRING 2002: Calculus for Social and Management Sciences.

**Student Advising**

- THE COOPER UNION

FALL 2013: *Cooper Team Coach*, 74<sup>th</sup> William Lowell Putnam Mathematical Competition (substituting for R. Smyth); team placed 42<sup>nd</sup> out of 430 competing teams.

**Curriculum and Program Development**

- THE COOPER UNION

SPRING 2014 – PRESENT: Curriculum research, undergraduate programs in Mathematics.

SPRING 2013: Numerical Analysis (graduate).

SUMMER 2011 – SUMMER 2014: Design and oversight of calculus placement examination.

FALL 2010 – SPRING 2011: Review and selection of textbook for calculus sequence.

**Assessment Work**

- THE COOPER UNION

SPRING 2013: Draft of Departmental Interim Report for Middle States Commission on Higher Education (collaboration with O. Agrawal).

SPRING 2012: Standardization/Composition of Drafts of the Departmental Syllabi for the Department of Mathematics, in preparation for the Fall 2012 ABET accreditation visit.

SPRING 2012: Design of Alumni Questionnaire regarding the Department of Mathematics (collaboration with G. del Cerro Santamaría).

FALL 2010 – SPRING 2011: Development and Draft of Student Learning Outcomes document for the Mathematics Program.

**Principal  
Research  
Interests**

- Dynamical Systems and Chaos Theory, Applied Dynamical Systems, Computational Mathematics, Applications to Mathematical Physics, Biology, Neuroscience, Machine Learning, and Pattern Recognition.

**Papers**

- PUBLISHED
  1. B. Fernandez and S.M. Mintchev. Wave generation in unidirectional chains of idealized neural oscillators. *Journal of Mathematical Neuroscience* **6:5** (2016).
  2. O.E. Lanford III and S.M. Mintchev. Stability of a family of traveling wave solutions in a feedforward chain of phase oscillators. *Nonlinearity* **28** (2015) 237-261.
  3. S.M. Mintchev and L.-S. Young. Self-organization in predominantly feedforward oscillator chains. *Chaos* **19** (2009) 043131.
- CURRENT PROJECTS / IN PREPARATION
  - Existence of stable traveling waves in smooth systems of coupled phase oscillators.
  - Stable perfectly-transmitted signals in phase oscillator chains with instantaneous Dirac impulse coupling.
  - The applicability of return-map studies to the global stability analysis of traveling wave solutions in chains of neural oscillators.

**Recent Talks  
and Poster  
Presentations**

- SUMMER 2016
  - JUNE 16, 2016: Wave generation in unidirectional chains of idealized neural oscillators (Workshop Modélization – LPMA, Université Paris 7 Denis Diderot, Paris, FR).
- SPRING 2016
  - MAY 20, 2016: Robust traveling waves in chains of simple neural oscillators (BAMM! 2016 – VCU, Richmond, VA).
- SUMMER 2015
  - JUNE 9, 2015: Rigorous results on robust traveling waves in periodically-forced chains of simple type-I oscillators (1<sup>st</sup> ICMNS – Antibes, FR).
- SPRING 2015
  - APRIL 23, 2015: Existence and stability of traveling wave solutions in a non-monotone feedforward chain of phase oscillators (NYU – Courant Institute).
- SPRING 2014
  - MARCH 10, 2014: Generation and stability of traveling wave solutions in unidirectional chains of phase oscillators (University of Pittsburgh).
- SUMMER 2013
  - JUNE 26 – AUGUST 1, 2013: Geometric singular perturbation theory – parts I,II, and III (NYU – Courant Institute).
- FALL 2012
  - NOVEMBER 7, 2012: Stability of a family of traveling wave solutions in a feedforward chain of phase oscillators (NYU – Courant Institute).

**Extended  
Research  
Visits**

- LABORATOIRE DE PROBABILITÉS ET MODÈLES ALÉATOIRES,  
CNRS – UNIVERSITÉ PARIS 7 DENIS DIDEROT, PARIS, FR  
JUNE, 2016: Project on Oscillator Dynamics (visiting Bastien Fernandez).  
JUNE, 2015: Project on Oscillator Dynamics (visiting Bastien Fernandez).
- CENTRE DE PHYSIQUE THÉORIQUE,  
CNRS – AIX-MARSEILLE UNIVERSITÉ, CAMPUS DE LUMINY CASE, MARSEILLE, FR  
JUNE/JULY, 2012: Project on Oscillator Dynamics (visiting Bastien Fernandez).

**Meetings  
Attended**

- MAY 20–22, 2016: *Biology and Medicine Through Mathematics (BAMM! 2016)*, Virginia Commonwealth University, Richmond, VA.
- JUNE 8–10, 2015: 1<sup>st</sup> *International Conference on Mathematical Neuroscience*, INRIA – Nice, Antibes, FR.
- MARCH 10–12, 2014: *Nonlinear Dynamics and Stochastic Methods: From Neuroscience to Other Biological Applications*, University of Pittsburgh, Pittsburgh, PA.
- MAY 22–26, 2011: *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT.
- JANUARY 14–15, 2010: *Mini-Conference on Dynamical Systems*, Princeton University, Princeton, NJ.
- MAY 17–21, 2009: *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT.
- APRIL 24–25, 2009: *Nonlinear Dynamics and Chaos Workshop 2009*, Courant Institute (NYU), New York, NY.
- JANUARY 22–26, 2007: *Introductory Workshop on Dynamical Systems with Emphasis on Extended Systems*, Mathematical Sciences Research Institute (MSRI), Berkeley, CA.
- OCTOBER 6–8, 2006: *Dynamics Days at the Courant Institute—7th Workshop on Nonlinear Dynamics and Chaos*, New York, NY.
- JUNE 27–JULY 10, 2005: *Resonances and Periodic Orbits—Spectrum and Zeta Functions in Quantum and Classical Chaos*, Centre Emile Borel, Institut Henri Poincaré, Paris, FR.
- OCTOBER 1–3, 2004: *Dynamics Days at CIMS—6th Workshop on Nonlinear Dynamics and Chaos*, New York, NY.
- MAY 17, 2002: *Knots in Washington XIV*, Washington, DC.

**Institutional  
Service  
Activities at  
Cooper  
Union**

- FACULTY-STUDENT SENATE  
OCTOBER 2012 – SEPTEMBER 2014; OCTOBER 2015 – PRESENT: Senate Secretary.  
SEPTEMBER 2012 – PRESENT: Representative of the Faculty of the School of Engineering.  
MAY 2011 – AUGUST 2012: Alternate Representative, School of Engineering.
- FACULTY OF THE HUMANITIES AND SOCIAL SCIENCES  
FEBRUARY 2012 – PRESENT: Representative of the Faculty of the School of Engineering.

**Research  
Service**

- 2015 – PRESENT: Referee for *Mathematical Reviews*, American Mathematical Society.
- 2011 – PRESENT: Journal Referee for *Chaos, An Interdisciplinary Journal of Nonlinear Science*. American Institute of Physics.

**Outreach  
Service**

- 2011 – 2012: *Judge*, NY Area Math Fair (held at Brooklyn Technical High School in March of each year).

- 2008 – 2009: *Organizer*, cSplash - committees on advertising and academic planning (see <http://www.csplash.org>).

**Professional Affiliations** • CURRENT MEMBER: American Mathematical Society (AMS), Mathematical Association of America (MAA), Society for Industrial and Applied Mathematics (SIAM).

**Fellowships and Awards**

- SEPTEMBER 2002 – AUGUST 2008: McCracken Doctoral Fellowship (NYU).
- SEPTEMBER 2002 – AUGUST 2005: VIGRE Fellowship (NSF).
- MAY 2002: Marvin Green Prize (GWU).
- MAY 2001: Ruggles Prize (GWU).
- SEPTEMBER 1998 – MAY 2002: Presidential Science Scholarship (GWU).