

Rashid V. Williams-García

Curriculum Vitae

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in [rvw-garcia](#)

Interests and Skills

Statistical physics: nonequilibrium statistical mechanics; critical phenomena; branching processes; cellular automata; stochastic processes; Monte Carlo methods

Information theory: mutual information; transfer entropy; artificial neural networks

Programming: MATLAB (10+ years); Mathematica (10+ years); C/C++ & Python (10+ years); LabView (2 years); Bash (2 years); TORQUE distributed resource manager (2 years)

Education

Ph.D., Physics, Indiana University Bloomington, 2016
Thesis title: “Phase Transitions in Living Neural Networks”.
Thesis advisors: Gerardo Ortiz and John M. Beggs.

M.S., Physics, Indiana University Bloomington, Concentration in condensed matter physics and mathematical physics. 2010

B.S., Physics, University of California Los Angeles. 2006

Publications

R. V. Williams-García, J. M. Beggs, and G. Ortiz, “Unveiling causal activity of complex networks,” *Europhysics Letters*, vol. 119, p. 18003 (2017).

R. V. Williams-García, M. Moore, J. M. Beggs, and G. Ortiz, “Quasicritical brain dynamics on a nonequilibrium Widom line,” *Physical Review E*, vol. 90, p. 062714 (2014).

Professional Appointments

Postdoctoral Associate, University of Pittsburgh, 2016–present
Department of Neurobiology, Department of Mathematics
PI: Nathan N. Urban, Co-PI: G. Bard Ermentrout
Project: Reduced reliability of neural responses to sensory stimulation in a computational model of autism.

Research Assistant, Indiana University Bloomington, 2012–2015
Department of Physics, PI: John M. Beggs
Project: Critical phenomena in animal models of epileptic neural networks.

Teaching Assistant, Indiana University Bloomington, Department of Physics. 2009–2014

Research Assistant, Indiana University Bloomington, 2008–2009
Department of Physics, PI: Robert de Ruyter
Project: Transmission of sensory information in single neurons.

Research Assistant, University of California Los Angeles, 2006–2008
Department of Physics & Astronomy, PI: Dolores Bozovic
Project: Analyses of nonlinear sensory responses in the bullfrog sacculus.

Teaching Certifications

Practitioner Level Certification in STEM Teaching, *University of Pittsburgh*, **2019**
Center for the Integration of Research, Teaching, and Learning

Completion of a mentored Teaching-as-Research project, presentation of findings to the Pitt-CIRTL learning community, and course requirements.

Associate Level Certification in STEM Teaching, *University of Pittsburgh*, **2016**
Center for the Integration of Research, Teaching, and Learning

Completion of course requirements introducing the Alignment Model and evidence-based teaching practices, creation of a teaching philosophy statement, and attendance of CIRTL Network online seminars.

Teaching Assistant (discussions)

2014 (1 semester): Lead discussions in Physics I (calculus-based), Physics majors (about 20 students per section, 5 sections). Topics: Newtonian mechanics, oscillations and waves, properties of matter, heat and thermodynamics. 360 hours per semester.

2011, 2012, & 2013 (4 semesters): Lead discussions in General Physics I, undergraduate science majors (about 20 students per section, 10 sections). Topics: Newtonian mechanics, oscillations and waves, properties of matter, thermodynamics. 360 hours per semester.

Teaching Assistant (labs)

2010, 2011, & 2014 (3 semesters): Lead practical work in General Physics II, undergraduate science majors (about 20 students per section, 10 sections). Topics: electricity and magnetism, optics, optical geometry, modern physics. 360 hours per semester.

2010, 2011, & 2013 (3 semesters): Lead practical work in General Physics I, undergraduate science majors (about 20 students per section, 10 sections). Topics: Newtonian mechanics, oscillations and waves, properties of matter, thermodynamics. 360 hours per semester.

2009 & 2010 (2 semesters): Lead practical work in Physical Science for Elementary Teachers, undergraduate elementary education majors (about 50 students). Topics: sounds, modeling, balance, forces, simple machines, mobiles, states of matter, light, colors, vision and the eye, electricity, magnetism, movement. 360 hours per semester, contribution to course development.

Teaching Assistant (grading)

2014 (1 semester): Correction of homework in Computing Applications in Physics, Master's and PhD students (about 20 students). Topics: least-squares methods, curve-fitting of non-linear functions, Monte-Carlo methods, data manipulation in C/C++, Bash, Matlab and Mathematica. 60 hours per semester.

Talks Invited

Pittsburgh Quantum Institute/Condensed Matter Physics Seminar, **2018**
“The Physics of Brain Science: Quasicriticality, An Organizing Principle”,
University of Pittsburgh.

Complexity Science Group Seminar, **2017**
“Quasicriticality and Causal Dynamics in Neural Networks”,
University of Calgary.

<i>Conference</i>	Complex Systems in Neuroscience , “From Single Neurons to Perception: Examining the Basis for Sensory Deficits in Autism”, University of Pittsburgh.	2018
<i>Seminar</i>	Center for the Neural Basis of Cognition Postdoctoral Seminar , “Strategic simplification of neural systems”, University of Pittsburgh/Carnegie Mellon University.	2018
	LENS/Condensed Matter Physics Seminar , “Phase Transitions in the Brain”, Indiana University Bloomington.	2014
Grants and Fellowships	Course Transformation Award (\$1,000) , University of Pittsburgh, Discipline-Based Science Education Research Center.	2018
	NIH National Research Service Award T32 NS086749 (\$87,384) , University of Pittsburgh, Department of Neurobiology.	2016
	Grant-in-Aid of Doctoral Research (\$1,000) , Indiana University Bloomington, The University Graduate School.	2015
	McCormick Science Grant (\$2,500) , Indiana University Bloomington, College of Arts & Sciences.	2015
	Faculty Research Support Program Seed Funding (\$29,663) , Indiana University Bloomington, Office of the Vice Provost for Research.	2014
	Earl Studevart Graduate Fellowship (\$10,000) , Indiana University Bloomington, Department of Physics.	2014
	Lilly Biocomplexity Fellowship (\$5,000) , Indiana University Bloomington, Biocomplexity Institute.	2009
	Graduate Scholars Fellowship (\$25,000) , Indiana University Bloomington, The University Graduate School.	2008
	NIH Postbaccalaureate Research Education Program (\$42,000) , University of California Los Angeles, Department of Chemistry & Biochemistry.	2006

Awards and Honors	<p>Methods in Computational Neuroscience Travel Award (\$4,226), 2017 Marine Biological Laboratory.</p> <p>Criticality in Biology Travel Award (€1,000), 2015 Max Planck Institute for the Physics of Complex Systems.</p> <p>Dynamics Days XXXIV Travel Award (\$500), 2015 American Institute of Physics.</p> <p>Dean's Honors, 2006 University of California Los Angeles, College of Letters & Science.</p> <p>Fellows Award (\$500), 2006 University of California Los Angeles, Center for Academic & Research Experience.</p>
Conferences Organized	<p>Complex Systems in Neuroscience: Bridging Theory and Experiment, 2018 University of Pittsburgh, Department of Mathematics.</p>
Reviewer	<p>Frontiers in Physics, Journal of Statistical Physics, Physical Review, and Scientific Reports</p>
Affiliations	<p>The American Physical Society (2014–present)</p>
Outreach	<p>Indiana University Bloomington: Groups Program Mentor, STEM Initiative (2012–2014), Physics Department Open House Volunteer (2008–2013). University of California Los Angeles: URC-CARE Research Mentorship Program (2007–2008), Society of Physics Students Vice President (2005).</p>