Ross Hamilton Parker

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EDUCATION

Brown University — Providence, RI
Ph.D. in applied mathematics — *Feb 2020*
Advisor: Björn Sandstede
Thesis: Nonlinear waves in the fifth-order Korteweg-de Vries equation

CUNY Hunter College — New York, NY
M.A. in pure mathematics — *Jan 2013*

University of Pennsylvania School of Medicine — Philadelphia, PA
M.D. — *May 2009*

Bowdoin College — Brunswick, ME
B.A. summa cum laude with highest honors in music, minor in chemistry — *May 1998*
Thesis: The First Service of Thomas Morley: an edition, performance, and commentary

ACADEMIC AND PROFESSIONAL APPOINTMENTS

Sarah Lawrence College — Bronxville, NY
Guest instructor — *Jan 2023 - Jul 2023*

Southern Methodist University — Dallas, TX
RTG postdoctoral fellow / visiting professor — *Aug 2020 - Jul 2023*

Brown University — Providence, RI
Visiting assistant professor / Deans' faculty fellow — *Sep 2019 - May 2020*
Full fellowship support for the fall semester, and appointment as a visiting assistant professor for the spring semester.

Columbia University Medical Center — New York, NY
Internship in internal medicine — *Jul 2009 - Jul 2010*

PUBLICATIONS AND PREPRINTS

Preprints

[1] Ross Parker, Jesús Cuevas-Maraver, P. G. Kevrekidis, and Alejandro Aceves. Standing and traveling waves in a model of periodically modulated one-dimensional waveguide arrays. *arXiv e-prints*, Jan 2023. `arXiv:2301.07631`.

[2] G. A. Tsolias, Robert J. Decker, A. Demirkaya, T. J. Alexander, Ross Parker, and P. G. Kevrekidis. Kink-antikink interaction forces and bound states in a ϕ^4 model with quadratic and quartic dispersion. *arXiv e-prints*, Nov 2022. `arXiv:2211.16375`.

Publications

[3] Efstathios G. Charalampidis, Ross Parker, P. G. Kevrekidis, and Stéphane Lafortune. The stability of the b-family of peakon equations. *Nonlinearity*, 36(2):1192, Jan 2023. `doi:10.1088/1361-6544/acac5b`.

[4] Ross Parker and Andrea K. Barreiro. Bifurcations of a neural network model with symmetry. *SIAM Journal on Applied Dynamical Systems*, 21(4):2535–2578, Dec 2022. `doi:10.1137/22M1470451`.

[5] Ross Parker, Jesús Cuevas-Maraver, P. G. Kevrekidis, and Alejandro Aceves. Revisiting multi-breathers in the discrete Klein-Gordon equation: A spatial dynamics approach. *Nonlinearity*, 35(11):5714–5748, Nov 2022. `doi:10.1088/1361-6544/ac8909`.

[6] Ross Parker and Björn Sandstede. Periodic multi-pulses and spectral stability in Hamiltonian PDEs with symmetry. *Journal of Differential Equations*, 334:368–450, Oct 2022. `doi:10.1016/j.jde.2022.06.019`.

[7] Ross Parker, Yannan Shen, Alejandro Aceves, and John Zweck. Spatiotemporal dynamics in a twisted, circular waveguide array. *Studies in Applied Mathematics*, 149(2):537–560, Aug 2022. `doi:10.1111/sapm.12511`.

[8] Ross Parker, Alejandro Aceves, Jesús Cuevas-Maraver, and P. G. Kevrekidis. Floquet solitons in square lattices: Existence, stability, and dynamics. *Physical Review E*, 105:044211, Apr 2022. `doi:10.1103/PhysRevE.105.044211`.

[9] Ross Parker, P. G. Kevrekidis, and Alejandro Aceves. Stationary multi-kinks in the discrete sine-Gordon equation. *Nonlinearity*, 35(2):1036–1060, Feb 2022. `doi:10.1088/1361-6544/ac3f8d`.

[10] Ross Parker and Alejandro Aceves. Standing-wave solutions in twisted multicore fibers. *Physical Review A*, 103:053505, May 2021. `doi:10.1103/PhysRevA.103.053505`.

[11] Ross Parker and Alejandro Aceves. Multi-pulse solitary waves in a fourth-order nonlinear Schrödinger equation. *Physica D: Nonlinear Phenomena*, 422:132890, Mar 2021. `doi:10.1016/j.physd.2021.132890`.

[12] Todd Kapitula, Ross Parker, and Björn Sandstede. A reformulated Krein matrix for star-even polynomial operators with applications. *SIAM Journal on Mathematical Analysis*, 52(5):4705–4750, Sep 2020. `doi:10.1137/19M124246X`.

[13] Ross Parker, P.G. Kevrekidis, and Björn Sandstede. Existence and spectral stability of multi-pulses in discrete Hamiltonian lattice systems. *Physica D: Nonlinear Phenomena*, 408:132414, Jul 2020. `doi:10.1016/j.physd.2020.132414`.

TEACHING

Sarah Lawrence College

Math 3010: Calculus II: further study of motion and change	Spring 2022

Southern Methodist University

Math 3304: Introduction to linear algebra	Fall 2022
Math 1338: Calculus II	Fall 2022
Math 3302: Calculus III: multi–variable and vector calculus	Spring 2022
Math 3311: Introduction to proof and analysis	Fall 2021
Math 3304: Introduction to linear algebra	Spring 2021
Math 1337: Calculus I	Fall 2020

Brown University

APMA 1360: Applied dynamical systems	Spring 2020
Intensive review of analysis for incoming graduate students	Summer 2019
APMA 1650: Statistical inference I	Summer 2016
APMA 350: Applied ordinary differential equations (teaching assistant)	Spring 2016
APMA 1650: Statistical inference I (teaching assistant)	Fall 2015

Pedagogy Training

Course design seminar. Sheridan Center for Teaching and Learning, Brown University 2019
Explored integrated course design principles, and developed syllabi, assignments, and activities for two courses.

Teaching consultant program. Sheridan Center for Teaching and Learning, Brown University 2017
Developed and refined skills in peer observation and feedback, leadership, and discussion facilitation.

Reflective teaching program. Sheridan Center for Teaching and Learning, Brown University 2015
Developed and refined fundamental teaching and assessment strategies and communication skills using a student-centered, evidence-based approach.

Other

Mathematics tutor. Noyce Scholars program, CUNY Hunter College 2011 - 2013
Tutored students in a scholarship program for future secondary school math teachers in calculus, differential equations, linear algebra, abstract algebra, real and complex analysis, probability, and numerical methods.

Teaching and laboratory assistant. Bowdoin College 1995 - 1998
Introductory chemistry, physics, and music theory.

MENTORING

Students mentored

Sabrina Hetzel (graduate student, Southern Methodist University) 2021 - present
Coherent structures in a model of pattern formation in nonlinear optical systems using a fourth order generalized Lugiato–Lefever equation.

Austin Marstaller (graduate student, Southern Methodist University) 2021 - present
Dynamics of laser-induced defects.

Alexandra Savu (undergraduate student, Southern Methodist University) 2022 - present
Dimensionality reduction of time series data from place cell spiking patterns of neurons in the hippocampus.

Panagiotis Syrgkanis (undergraduate, Brown University) 2019 - 2020
Independent reading project on the application of dynamical systems to neuroscience as part of the directed reading program.

Summer REUs

Ripples and replays in the hippocampus. Southern Methodist University Jul 2022
Mentored three undergraduate students in an independent research projects on dimensionality reduction for time series of neural spiking data in collaboration with laboratory of Brad Pfeiffer at UT Southwestern Medical Center.

Dynamics of complex systems. Southern Methodist University Jul 2021
Mentored nine undergraduate students in independent research projects on coupled oscillators, including the FPUT model and the Kuromoto model, in collaboration with UT Rio Grande Valley.

PRESENTATIONS

Invited Talks

Multi-modal fourth-order optical solitons Princeton, NJ
Center for Communications Research, Princeton *17 Jan 2023*

Bright and dark multi-solitons in Hamiltonian systems Houston, TX
University of Houston PDE seminar *11 Nov 2022*

Bright and dark multi-solitons in a fourth-order NLS equation Houston, TX
5th Annual Meeting of the SIAM Texas-Louisiana Section *4 - 6 Nov 2022*

Bright and dark multi-solitons in a fourth-order NLS equation — Virtual
SIAM Conference on Nonlinear Waves and Coherent Structures — *30 Aug - 2 Sep 2022*

Multi-pulse solitary waves in Hamiltonian systems: theory and numerics — Richardson, TX
UT Dallas computational science seminar — *8 Apr 2022*

Multi-kinks and multi-breathers in the discrete sine-Gordon equation — Athens, GA
IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena — *30 Mar - 1 Apr 2022*

Standing-wave solutions in twisted multicore fibers — South Padre Island, TX
4th Annual Meeting of the SIAM Texas-Louisiana Section — *5 - 7 Nov 2021*

Periodic multi-pulses in Hamiltonian systems with symmetry — Virtual
SIAM Conference on Applications of Dynamical Systems 2021 — *23 - 27 May 2021*

Instability bubbles for periodic multi-pulse solutions to Hamiltonian systems — Virtual
3rd Annual Meeting of the SIAM Texas-Louisiana Section — *18 Oct 2020*

Multi-pulse solitary waves in Hamiltonian systems — Virtual
SMU Math Colloquium — *24 Sep 2020*

Spectral stability of periodic multi-pulses in the 5th Order KdV equation — Snowbird, UT
SIAM Conference on Applications of Dynamical Systems 2019 — *19 - 23 May 2019*

Spectral stability of multi-pulses via the Krein matrix — Athens, GA
IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena — *17 - 19 Apr 2019*

Stability of double pulse solutions to the 5th order KdV equation — Amherst, MA
Applied Mathematics Colloquium, University of Massachusetts — *13 Feb 2018*

Stability of double pulse solutions to the 5th order KdV equation — Boston, MA
Brown/BU Joint Dynamics and PDE Seminar — *30 Nov 2017*

Contributed Talks

Solitons and multi-solitons: a spatial dynamics approach — Providence, RI
SIAM Math Slam, Brown University — *8 Nov 2018*

Stability of double pulse solutions to the 5th order KdV equation — Providence, RI
Applied Mathematics Graduate Seminar, Brown University — *11 Dec 2017*

Posters and Multimedia Presentations

Bifurcations of a neural network model with symmetry — Virtual
Dynamics Days 2023 — *9 - 11 Jan 2022*

Spectral stability of multi-pulse solutions to the suspension bridge equation — Columbia, MO
KuMuNu 2019 — *27 - 28 Apr 2019*

Spectral stability of multi-pulse solutions to the suspension bridge equation — Evanston, IL
Dynamics Days 2019 — *4 - 6 Jan 2019*

Stability of double pulse solutions to the 5th order KdV equation — Anaheim, CA
SIAM Conference on Nonlinear Waves and Coherent Structures 2018 — *11 - 14 Jun 2018*

Stability of double pulse solutions to the 5th order KdV equation — Lawrence, KS
KuMuNu 2018 — *21 - 22 Apr 2018*

Stability of double pulse solutions to the 5th order KdV equation — Denver, CO
Dynamics Days 2018 — *4 - 6 Jan 2018*

Conway's Game of Lights   New York, NY
New York World Maker Faire 2013   *21 - 22 Sep 2013*
    Evolving cellular automata displayed on a 20×20 grid of individually addressable RGB LEDs, controlled by Arduino and Rasbperry Pi microcontrollers

FELLOWSHIPS AND GRANTS

Grants

AMS-Simons Travel Grant   *Jun, 2022*
Provides early-career mathematicians with funds for research-related travel ($5000)

Travel Grants

SIAM student travel award   *30 Aug - 3 Sep 2022*
Attendance and minisymposium presentation at SIAM Conference on Nonlinear Waves and Coherent Structures 2022

SIAM student travel award   *23 - 27 May 2021*
Attendance and minisymposium presentation at SIAM Conference on Applications of Dynamical Systems 2021 (virtual)

SIAM student travel award   *19 - 23 May 2019*
Attendance and minisymposium presentation at SIAM Conference on Applications of Dynamical Systems 2019

Brown University graduate school travel award   *17 - 19 Apr 2019*
Attendance and minisymposium presentation at IMACS 2019

Brown University graduate school travel award   *11 - 14 Jun 2019*
Attendance and poster presentation at SIAM Conference on Nonlinear Waves and Coherent Structures 2018

JOURNALS REFEREED

Physica D: Nonlinear Phenomena
Communications in Nonlinear Science and Numerical Simulation

WORKSHOPS

Brown-ICERM-Kobe Summer Simulation School   *17 - 31 Aug 2015*
Workshop on high performance computing in collaboration with Kobe University, Japan

OUTREACH AND SERVICE

Minisymposium co-organizer   Houston, TX
5th Annual Meeting of the SIAM Texas-Louisiana Section   *Nov 2022*
Stability of Solitary Waves with applications to optics and fluids

Minisymposium co-organizer   South Padre Island, TX
4th Annual Meeting of the SIAM Texas-Louisiana Section   *Nov 2021*
Dispersive wave equations with applications in optics and fluids

Minisymposium co-organizer   Virtual
SIAM Conference on Applications of Dynamical Systems 2021   *May 2021*
MS6: Coherent structures in dispersive systems

Co-organizer   Providence, RI
Brown/BU/UMass joint dynamical systems and PDE seminar   *2019 - 2020*

Minisymposium co-organizer   Snowbird, UT

SIAM Conference on Applications of Dynamical Systems 2019   *May 2019*
MS20: Existence and stability of nonlinear waves: theory and numerical computations

Co-organizer, weekly graduate student seminar   Providence, RI
Division of Applied Mathematics, Brown University   *2018 - 2019*

Review session leader, real analysis   Providence, RI
Division of Applied Mathematics, Brown University   *2017 - 2020*

Vice president   Providence, RI
Brown University SIAM student chapter   *2017 - 2019*

Small group discussion leader, reflective teaching seminar   Providence, RI
Sheridan Center for Teaching and Learning, Brown University   *2017*

Department liaison   Providence, RI
Sheridan Center for Teaching and Learning, Brown University   *2015 - 2020*

Co-chair, Pinewoods Scottish Sessions   Boston, MA
Royal Scottish Country Dance Society, Boston Branch   *2018*

Co-chair, Pinewoods Scottish Sessions   Boston, MA
Royal Scottish Country Dance Society, Boston Branch   *2017*

HONORS AND AWARDS

Alpha Omega Alpha   University of Pennsylvania
Medical honor society   *2008*

Phi Beta Kappa   Bowdoin College
Undergraduate honor society   *1998*

Sue Winchell Burnett Senior Prize in Music   Bowdoin College
Awarded to the senior who has made the most significant contribution to the department   *1998*

Edwin Herbert Hall Sophomore Prize in Physics   Bowdoin College
Awarded to the best sophomore scholar in the field of physics   *1996*

CRC First Year Prize in Chemistry   Bowdoin College
Recognizes outstanding achievement and promise in chemistry   *1995*