

# Ross Hamilton Parker

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## EDUCATION

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### Brown University

*Ph.D. in applied mathematics*

Advisor: Björn Sandstede

Thesis: Nonlinear waves in the fifth-order Korteweg-de Vries equation

Providence, RI

*Dec 2019*

### CUNY Hunter College

*M.A. in pure mathematics*

New York, NY

*Jan 2013*

### University of Pennsylvania School of Medicine

*M.D.*

Philadelphia, PA

*May 2009*

### Bowdoin College

*B.A. summa cum laude with highest honors in music, minor in chemistry*

Thesis: The First Service of Thomas Morley: an edition, performance, and commentary

Brunswick, ME

*May 1998*

## ACADEMIC AND PROFESSIONAL APPOINTMENTS

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### Southern Methodist University

*RTG postdoctoral fellow / visiting professor*

Dallas, TX

*Aug 2020 - present*

### Brown University

*Visiting assistant professor / Deans' faculty fellow*

Full fellowship support for the fall semester, and appointment as a visiting assistant professor for the spring semester.

Providence, RI

*Sep 2019 - May 2020*

### Columbia University Medical Center

*Internship in internal medicine*

New York, NY

*Jul 2009 - Jul 2010*

## PUBLICATIONS AND PREPRINTS

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- [1] 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.
- [2] Ross Parker, Yannan Shen, Alejandro Aceves, and John Zweck. Spatiotemporal dynamics in a twisted, circular waveguide array. 2022. arXiv:2201.11645.
- [3] Ross Parker and Andrea K. Barreiro. Bifurcations of a neural network model with symmetry. 2022. arXiv:2201.02713.
- [4] Ross Parker, P. G. Kevrekidis, and Alejandro Aceves. Stationary multi-kinks in the discrete sine-Gordon equation. *Nonlinearity*, 35(2):1036–1060, February 2022. doi:10.1088/1361-6544/ac3f8d.
- [5] 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.
- [6] Ross Parker and Alejandro Aceves. Multi-pulse solitary waves in a fourth-order nonlinear Schrödinger

equation. *Physica D: Nonlinear Phenomena*, 422:132890, March 2021. doi:10.1016/j.physd.2021.132890.

- [7] Efstathios G. Charalampidis, Ross Parker, Panayotis G. Kevrekidis, and Stéphane Lafortune. The stability of the  $b$ -family of peakon equations. *arXiv e-prints*, December 2020. arXiv:2012.13019.
- [8] Ross Parker and Björn Sandstede. Periodic multi-pulses and spectral stability in Hamiltonian PDEs with symmetry. *arXiv e-prints*, October 2020. arXiv:2010.05728.
- [9] 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, September 2020. doi:10.1137/19M124246X.
- [10] 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, July 2020. doi:10.1016/j.physd.2020.132414.

## TEACHING

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### Southern Methodist University

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

<b>Course design seminar.</b> Sheridan Center for Teaching and Learning, Brown University	2019
Explored integrated course design principles, and developed syllabi, assignments, and activities for two courses.	
<b>Teaching consultant program.</b> Sheridan Center for Teaching and Learning, Brown University	2017
Developed and refined skills in peer observation and feedback, leadership, and discussion facilitation.	
<b>Reflective teaching program.</b> 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.	

### Mentoring

<b>Summer REU.</b> Department of Mathematics, Southern Methodist University	July 2021
Mentored nine undergraduate students in independent research projects on coupled oscillators, including the FPUT model and the Kuromoto model.	
<b>Directed Reading Program.</b> Division of Applied Mathematics, Brown University	2019
Mentored undergraduates students in an independent reading project on the application of dynamical systems to neuroscience.	

### Other

<b>Mathematics tutor.</b> Noyce Scholars program, CUNY Hunter College	2011 - 2013
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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  
Introductory chemistry, physics, and music theory.

1995 - 1998

## PRESENTATIONS

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### Invited Talks

- 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

- 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 World Maker Faire 2013*

Evolving cellular automata displayed on a  $10 \times 20$  grid of individually addressable RGB LEDs, controlled by Arduino and Raspberry Pi microcontrollers

New York, NY

21-22 Sep, 2013

## JOURNALS REFEREED

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Physica D: Nonlinear Phenomena

## WORKSHOPS

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### Brown-ICERM-Kobe Summer Simulation School

17-31 Aug, 2015

Workshop on high performance computing in collaboration with Kobe University, Japan

## OUTREACH AND SERVICE

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### Minisymposium organizer

*4th Annual Meeting of the SIAM Texas-Louisiana Section*

Dispersive wave equations with applications in optics and fluids

South Padre Island, TX

Nov 2021

### Minisymposium co-organizer

*SIAM Conference on Applications of Dynamical Systems 2021*

MS6: Coherent structures in dispersive systems

Virtual

May 2021

### Co-organizer

*Brown/BU/UMass joint dynamical systems and PDE seminar*

Providence, RI

2019 - 2020

### Minisymposium co-organizer

*SIAM Conference on Applications of Dynamical Systems 2019*

MS20: Existence and stability of nonlinear waves: theory and numerical computations

Snowbird, UT

May 2019

### Co-organizer, weekly graduate student seminar

*Division of Applied Mathematics, Brown University*

Providence, RI

2018 - 2019

### Review session leader, real analysis

*Division of Applied Mathematics, Brown University*

Providence, RI

2017 - 2020

### Vice president

*Brown University SIAM student chapter*

Providence, RI

2017 - 2019

### Small group discussion leader, reflective teaching seminar

*Sheridan Center for Teaching and Learning, Brown University*

Providence, RI

2017

### Department liaison

*Sheridan Center for Teaching and Learning, Brown University*

Providence, RI

2015 - 2020

### Co-chair, Pinewoods Scottish Sessions

*Royal Scottish Country Dance Society, Boston Branch*

Boston, MA

2018

### Co-chair, Pinewoods Scottish Sessions

*Royal Scottish Country Dance Society, Boston Branch*

Boston, MA

2017

## TRAVEL GRANTS

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### 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 April, 2019*

Attendance and minisymposium presentation at IMACS 2019

**Brown University graduate school travel award***11-14 June, 2019*

Attendance and poster presentation at SIAM Conference on Nonlinear Waves and Coherent Structures 2018

## HONORS AND AWARDS

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**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*