

# 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, Yannan Shen, Alejandro Aceves, and John Zweck. Spatiotemporal dynamics in a twisted, circular waveguide array. 2022. [arXiv:2201.11645](#).
- [2] Ross Parker and Andrea K. Barreiro. Bifurcations of a neural network model with symmetry. 2022. [arXiv:2201.02713](#).
- [3] 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.
- [4] Ross Parker, Jesús Cuevas-Maraver, P. G. Kevrekidis, and Alejandro Aceves. Floquet solitons in square lattices: Existence, stability and dynamics. December 2021. [arXiv:2112.04972](#).
- [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

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| 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

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| <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

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| <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 undergraduate students in an independent reading project on the application of dynamical systems to neuroscience.                     |           |

### Other

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|---|-------------|
| <b>Mathematics tutor.</b> 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  
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**  
*IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena* Athens, GA  
30 Mar-1 Apr, 2022
- Standing-wave solutions in twisted multicore fibers**  
*4th Annual Meeting of the SIAM Texas-Louisiana Section* South Padre Island, TX  
5-7 Nov, 2021
- Periodic multi-pulses in Hamiltonian systems with symmetry**  
*SIAM Conference on Applications of Dynamical Systems 2021* Virtual  
23-27 May, 2021
- Instability bubbles for periodic multi-pulse solutions to Hamiltonian systems**  
*3rd Annual Meeting of the SIAM Texas-Louisiana Section* Virtual  
18 Oct, 2020
- Multi-pulse solitary waves in Hamiltonian systems**  
*SMU Math Colloquium* Virtual  
24 Sep, 2020
- Spectral stability of periodic multi-pulses in the 5th Order KdV equation**  
*SIAM Conference on Applications of Dynamical Systems 2019* Snowbird, UT  
19-23 May, 2019
- Spectral stability of multi-pulses via the Krein matrix**  
*IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena* Athens, GA  
17-19 Apr, 2019
- Stability of double pulse solutions to the 5th order KdV equation**  
*Applied Mathematics Colloquium, University of Massachusetts* Amherst, MA  
13 Feb, 2018
- Stability of double pulse solutions to the 5th order KdV equation**  
*Brown/BU Joint Dynamics and PDE Seminar* Boston, MA  
30 Nov, 2017

### Contributed Talks

- Solitons and multi-solitons: a spatial dynamics approach**  
*SIAM Math Slam, Brown University* Providence, RI  
8 Nov, 2018
- Stability of double pulse solutions to the 5th order KdV equation**  
*Applied Mathematics Graduate Seminar, Brown University* Providence, RI  
11 Dec, 2017

### Posters and Multimedia Presentations

- Spectral stability of multi-pulse solutions to the suspension bridge equation**  
*KuMuNu 2019* Columbia, MO  
27-28 Apr, 2019
- Spectral stability of multi-pulse solutions to the suspension bridge equation**  
*Dynamics Days 2019* Evanston, IL  
4-6 Jan, 2019
- Stability of double pulse solutions to the 5th order KdV equation**  
*SIAM Conference on Nonlinear Waves and Coherent Structures 2018* Anaheim, CA  
11-14 Jun, 2018
- Stability of double pulse solutions to the 5th order KdV equation**  
*KuMuNu 2018* Lawrence, KS  
21-22 Apr, 2018
- Stability of double pulse solutions to the 5th order KdV equation**  
*Dynamics Days 2018* Denver, CO  
4-6 Jan, 2018
- Conway's Game of Lights**  
*New York World Maker Faire 2013* New York, NY  
21-22 Sep, 2013

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

## 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

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

## 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