Curriculum Vitae

YIPING MA   E-mail: yiping.m@gmail.com | Web: http://www.yipingma.com

EDUCATION AND EMPLOYMENT

11/2016-present   Dept. of Mathematics, Physics, and Electrical Engineering, Northumbria University

- 11/2021-present: Assistant Professor in Mathematics
- 11/2016-10/2021: Vice Chancellor's Fellow in Mathematics

08/2013-07/2016   Department of Applied Mathematics, University of Colorado at Boulder

- Research Associate/Instructor

11/2012-07/2013   Dept. of Engineering Sciences and Applied Mathematics, Northwestern University

10/2011-10/2012   Dept. of Geophysical Sciences, University of Chicago

- Ed Lorenz Postdoctoral Fellow in the Mathematics and Climate Research Network (MCRN)

08/2006-08/2011   Department of Physics, University of California at Berkeley

- PhD (December 2011) in Physics; Advisor: Edgar Knobloch
  - Dissertation Title: Localized Structures in Forced Oscillatory Systems

02/2003-05/2006   Hong Kong University of Science and Technology (HKUST)

- BSc in Physics and Mathematics; Minor: Information Technology (≈ Computer Science)
  - 01-08/2005: Exchange student at Université Joseph Fourier (now Université Grenoble Alpes)

09/2002-12/2002   Foundation semester at Nanjing University

RESEARCH INTERESTS

- Mathematical: nonlinear waves, pattern formation, dynamical systems, statistical physics, and related fields
- Applications: metamaterials, nonlinear optics, climate dynamics, fluid mechanics, and related fields

PUBLICATIONS

Note: Co-authors may be ordered either by contribution or alphabetically.

Current h-index as of 14 March 2024: 12/11/10 on Google Scholar/Scopus/Web of Science

Published/Accepted (20 articles):

- D. D. J. M. Snee and Y.-P. Ma. Domain walls and vector solitons in the coupled nonlinear Schrödinger equation. Journal of Physics A 57 (3), 035702 (2024).
- Y.-P. Ma and H. Susanto. Topological edge solitons and their stability in a nonlinear Su-Schrieffer-Heeger model. Physical Review E 104, 054206 (2021).
- D. D. J. M. Snee and Y.-P. Ma. Edge solitons in a nonlinear mechanical topological insulator. Extreme Mechanics Letters 30, 100487 (2019).
- Y.-P. Ma, I. Sudakov, C. Strong, and K. M. Golden. Ising model for melt ponds on Arctic sea ice. New Journal of Physics 21(6), 063029 (2019).
- M. J. Ablowitz, Y.-P. Ma, and I. Rumanov. A universal asymptotic regime in the hyperbolic nonlinear Schrödinger equation. SIAM Journal on Applied Mathematics 77(4), 1248-1268 (2017).

- P. Weidman and Y.-P. Ma. The competing effects of wall transpiration and stretching on Homann stagnation-point flow. European Journal of Mechanics - B/Fluids 60, 237-241 (2016).

- Y.-P. Ma and E. Knobloch. Two-dimensional localized structures in harmonically forced oscillatory systems. Physica D 337, 1-17 (2016).

- M. J. Ablowitz, A. Demirci, and Y.-P. Ma. Dispersive shock waves in the Kadomtsev-Petviashvili and two-dimensional Benjamin-Ono equations. Physica D 333, 84-98 (2016).

- C. Chong, P. G. Kevrekidis, M. J. Ablowitz, and Y.-P. Ma. Conical wave propagation and diffraction in two-dimensional hexagonally packed granular lattices. Physical Review E 93, 012909 (2016).

- M. J. Ablowitz and Y.-P. Ma. Strong transmission and reflection of edge modes in bounded photonic graphene. Optics Letters 40 (20), 4635-4638 (2015).

- M. J. Ablowitz, C. W. Curtis, and Y.-P. Ma. Adiabatic dynamics of edge waves in photonic graphene. 2D Materials 2, 024003 (2015).

- M. J. Ablowitz, C. W. Curtis, and Y.-P. Ma. Linear and nonlinear traveling edge waves in optical honeycomb lattices. Physical Review A 90, 023813 (2014).

- J. C. Tzou, Y.-P. Ma, A. Bayliss, B. J. Matkowsky, and V. A. Volpert. Homoclinic snaking near a codimension-two Turing-Hopf bifurcation point in the Brusselator model. Physical Review E 87, 022908 (2013).

- A. R. Champneys, E. Knobloch, Y.-P. Ma and T. Wagenknecht. Homoclinic snakes bounded by a saddle-center periodic orbit. SIAM Journal on Applied Dynamical Systems 11(4), 1583–1613 (2012).

- Y.-P. Ma and E. Knobloch. Depinning, front motion and phase slips. Chaos 22, 033101 (2012).

- Y.-P. Ma and E. A. Spiegel. A diagrammatic derivation of (convective) pattern equations. Physica D 240, 150-165 (2011).

- Y.-P. Ma, J. Burke, and E. Knobloch. Defect-mediated snaking: A new growth mechanism for localized structures. Physica D 239, 1867-1883 (2010).

- Y.-P. Ma, S. Gonçalves, S. Mignot, J.-P. Nadal, and M. B. Gordon. Cycles of cooperation and free-riding in social systems. The European Physical Journal B 71, 597-610 (2009).

- C.-H. Yeung, Y.-P. Ma, and K. Y. M. Wong. Epoch lifetimes in the dynamics of a competing population. International Journal of Modern Physics B 21, 4048-4053 (2007).

- C.-H. Yeung, Y.-P. Ma, and K. Y. M. Wong. Stable aggregates in the dynamics of a competing population. Journal of the Korean Physical Society 50, 196-200 (2007).

News (1 article):

- Kenneth M. Golden, Yiping Ma, Courtenay Strong, and Ivan Sudakov. From Magnets to Melt Ponds. **SIAM News**, November 2020. This news article features our research article New Journal of Physics 21(6), 063029 (2019). Other news articles featuring this research article but not coauthored by me have appeared in **Wired**, **Scientific American**, **Physics World**, **Eos (AGU)**, and **Notices of the AMS**.

Thesis/Proceedings (2 items):

- Y.-P. Ma. Localized structures in forced oscillatory systems. PhD thesis, University of California at Berkeley (2011).

- Y.-P. Ma. The derivation and application of convective pattern equations. Proceedings of the Summer Study Program in G.F.D., Woods Hole Oceanographic Institution, 308-329 (2009).

TEACHING

Note: S = Spring Semester, F = Fall (Autumn) Semester.

As Module Tutor at Northumbria University:

- KL3005 – Logic and Algorithms (Mathematics Year 0): F17 – S18
- KC4010 – Engineering Mathematics (Electrical Engineering Year 1): F22, F23
- KC4012 – Computational Mathematics (Mathematics Year 1): S17, F17 – S18, F19 – S20, F20, F21, F22, F23
- KC5000 – Further Computational Mathematics (Mathematics Year 2): S23, S24
- KC5026 – Applied Modeling (Mathematics Year 2): S17, F19, F20

As Instructor at CU Boulder:

- APPM 2350 – Multivariate Calculus (Engineering Year 2): S16
- APPM 2360 – Differential Equations and Linear Algebra (Engineering Year 2): F13, F14, S15, F15

As Graduate Student Instructor (GSI) at UC Berkeley:

- Physics 8B – Electromagnetism and Optics (Pre-med Year 1): F07, S08, F08, F09
- Physics 8A – Mechanics and Thermodynamics (Pre-med Year 1): F06, S07
- Physics 221A – Quantum Mechanics (Grader, Physics Graduate Year 1): F06

Professional Recognition:

- Fellow of the Higher Education Academy (FHEA), Jun 2019

Administration:

- Year 1 Tutor, Mathematics: Sep 2023 - present

RESEARCH SUPERVISION

PhD:

- David Snee, Northumbria University, Oct 2017 – Jun 2021
  - Dissertation Title: Nonlinear Edge Waves in Mechanical Topological Insulators

Master:

- Richard Cook, Northumbria University, Jan 2018 – May 2018

Undergraduate:

- Typically one to four undergraduate dissertations per academic year

PROFESSIONAL ACTIVITIES

Reviewer:

- Journals (times refereed): Nonlinear Dynamics (12), Chaos, Solitons & Fractals (4), SIAM Journal on Applied Dynamical Systems (3), Chaos (2), Chinese Journal of Physics (2), Computer Physics Communications (2), Nonlinearity (2), Optical and Quantum Electronics (2), Physics (2), AIMS Mathematics (1), Annals of Glaciology (1), Journal of Applied Physics (1), Journal of Fluid Mechanics (1), Physica D: Nonlinear Phenomena (1), Royal Society Open Science (1), Studies in Applied Mathematics (1)

- Funding agencies: Engineering and Physical Sciences Research Council (UK)

- Magazines: Notices of the American Mathematical Society

PhD Viva Examination:

- External Examiner: School of Computing, University of Leeds (Dec 2023)

Events Organized:

- Mini-symposium "Spatially localized structures in dissipative systems: computation and analysis". The Fourth International Conference: Nonlinear Waves – Theory and Applications, Beijing, Jun 2016. Co-organized with Alan R. Champneys (Bristol) and Jonathan H. P. Dawes (Bath).

- Mini-symposium "Graphene Lattices: Phenomena and Analysis". The Ninth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, GA, Apr 2015. Co-organized with Christopher W. Curtis (SDSU) and Yi Zhu (Tsinghua).

- Webinar "Mathematics of Climate Tipping Points". Mathematics and Climate Research Network (MCRN), Apr 2012 - Dec 2012. Co-organized with Mary Silber (Northwestern) et al.

AWARDS

- Phase Transitions in Arctic Melt Ponds. MCRN mini-grant, Mar - Sep 2013, $2,500. Co-PIs: Kenneth M. Golden and Ivan A. Sudakov (University of Utah).

- Student Travel Award, The Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, 2011

- SIAM Student Travel Award, SIAM Conference on Nonlinear Waves and Coherent Structures, 2010

- GFD Fellow, Woods Hole Oceanographic Institution, Class of 2009

- Winner of the "Maxwell and His Equations" T-Shirt Contest, UC Berkeley, Fall 2006 (for the top student in Physics 209, graduate electrodynamics)

- Academic Achievement Medal, HKUST, 2006 (awarded annually to top 1% graduates)

- Dean's List, HKUST, 2003 - 2006 (each semester in HKUST)

- Drs. Richard Charles and Esther Yewpick Lee Charitable Foundation Scholarship for Undergraduate Students from the Mainland, HKUST, Spring 2003

- UGC Publicly-Funded Scholarship Scheme for Mainland Students, HKUST, Fall 2003 - Spring 2006

CONFERENCE PRESENTATIONS

Topic: Edge solitons in optical and mechanical topological insulators

- Invited talk at 4th Eastern Arc Conference on Topological Solitons and Quantum Fluids, Norwich, UK, Mar 2019

- Invited talk at Workshop on the Onset of Rogue Waves, Northumbria University, Newcastle, UK, Apr 2017

- Invited session talk at the Ninth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, USA, Apr 2015

Topic: Ising models for Arctic melt ponds

- Invited talk at Workshop on Multi-scale modelling of ice characteristics and behaviour, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, Sep 2017

- Invited substitute talk at Joint Mathematics Meetings, Seattle, USA, Jan 2016
- Poster at PIMS Conference on the Mathematics of Sea Ice, Vancouver, Canada, Sep 2015 (presented by I. Sudakov)
- Invited mini-symposium talk at SIAM Conference on Applications of Dynamical Systems, Snowbird, USA, May 2015

Topic: Supraglacial lakes on the George VI Ice Shelf

- Poster at MCRN Annual Meeting, Boulder, USA, Oct 2012
- Poster at AGU Fall Meeting, San Francisco, USA, Dec 2011 (with S. Koppaka et al)

Topic: Localized structures in forced oscillatory systems

- Talk at 3rd IMA Conference on Nonlinearity and Coherent Structures, Newcastle, UK, Jul 2019
- Mini-symposium talk at the Fourth International Conference: Nonlinear Waves – Theory and Applications, Beijing, China, Jun 2016 (presented by E. Knobloch)
- Invited talk at Joint US-Japan Workshop for Young Researchers on Interactions among Localized Patterns in Dissipative Systems, Minneapolis, USA, Jun 2013
- Invited mini-symposium talk at SIAM Conference on Applications of Dynamical Systems, Snowbird, USA, May 2013
- Poster at MCRN Annual Meeting, Chapel Hill, USA, Sep 2011
- Poster at Dynamics Days, Chapel Hill, USA, Jan 2011
- Invited mini-symposium talk at SIAM Conference on Applications of Dynamical Systems, Snowbird, USA, May 2011
- Contributed talk at the Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, USA, Apr 2011
- Invited mini-symposium talk at SIAM Conference on Nonlinear Waves and Coherent Structures, Philadelphia, USA, Aug 2010
- Poster at the Second International Conference: Nonlinear Waves – Theory and Applications, Beijing, China, Jun 2010

Topic: Homoclinic snakes bounded by a saddle-centre periodic orbit

- Poster at Conference "Geometric Methods for Infinite-Dimensional Dynamical Systems" (to celebrate the 60th birthday of Christopher K.R.T. Jones), Providence, USA, Nov 2011

COLLOQUIUM TALKS

Topic: Edge solitons in optical and mechanical topological insulators

- Mathematics and Mathematical Physics (MMP) Seminar, Northumbria University, Dec 2019
- Leeds Applied Nonlinear Dynamics (LAND) Seminar, University of Leeds, Nov 2019
- Department of Mathematical Sciences, University of Essex, May 2019
- Mathematics & Mathematical Physics Series, Northumbria University, Jan 2017
- Department of Mathematics, Hangzhou Normal University, Aug 2016
- Department of Mathematics, Macquarie University, May 2016

- Nonlinear Waves Seminar, University of Colorado at Boulder, Sep 2015
- Nonlinear Waves Seminar, University of Colorado at Boulder, Mar 2014

Topic: Ising model for Arctic melt ponds

- Earth & Environment Lunchtime Seminar, Northumbria University, Feb 2017

Topic: Localized patterns in driven dissipative systems

- Center for Mathematical Sciences, Huazhong University of Science and Technology, Aug 2017
- Department of Mathematics, Hangzhou Normal University, Aug 2016
- BU/Brown PDE seminar, Boston University, Feb 2015
- Nonlinear Waves Seminar, University of Colorado at Boulder, Oct 2013
- Department of Mathematics, University of Utah, Mar 2012
- Department of Engineering Sciences and Applied Mathematics, Northwestern University, Oct 2011
- Department of Physics, Georgia Institute of Technology, Apr 2011
- Department of Mathematical Sciences, University of Bath, Jun 2010

Topic: The derivation and application of convective pattern equations

- The Summer Study Program in GFD, Woods Hole Oceanographic Institution, Aug 2009

CONFERENCES ATTENDED

- MCRN Junior Researcher Workshop, Chapel Hill, Sep 5 - 7, 2012
- MBI Workshop on Ocean Ecologies and Their Physical Habitats in a Changing Climate, Columbus, Jun 20 - Jul 1, 2011
- The Launch Conference of the World Year of Physics (Physics for Tomorrow), Paris, Jan 13 - 15, 2005

ACADEMIC VISITS

- Aug 2016 and Sep 2017: Department of Mathematics, Hangzhou Normal University. Hosted by Yancong Xu.
- Aug – Sep 2017: Center for Mathematical Sciences, Huazhong University of Science and Technology. Hosted by Yayun Zheng.
- Aug 2010: GFD program, Woods Hole Oceanographic Institution. Hosted by Edward A. Spiegel.
- Jun 2010: Department of Engineering Mathematics, University of Bristol and Department of Mathematical Sciences, University of Bath. Hosted by Alan R. Champneys and Jonathan H. P. Dawes.
- Dec 2008: Department of Applied Mathematics, University of Washington, Seattle. Hosted by J. Nathan Kutz.
- Jun - Aug 2005: Laboratoire Leibniz-IMAG, Grenoble, France. Hosted by Mirta B. Gordon.

SKILLS

- Programming/Software: experience in C++, MATLAB, Mathematica, AUTO-07p; knowledge of Lisp/Scheme, Python
- Languages: native Chinese (mandarin), proficient English, daily Cantonese, intermediate French, elementary Russian