Curriculum Vitae

YIPING MA

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EDUCATION AND EMPLOYMENT

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

- Vice Chancellor's Research Fellow in Extreme Environments

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)

09/2006-08/2011   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)
    - Spring 2005: Exchange semester 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

Applications:

- Metamaterials
- Nonlinear optics
- Climate dynamics
- Fluid mechanics

PUBLICATIONS

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

Published/Accepted:

- D. D. J. M. Snee and Y.-P. Ma. Edge solitons in a nonlinear mechanical topological insulator. Extreme Mechanics Letters, 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 J. Appl. Math. 77(4), 1248-1268 (2017).

- P. Weidman and Y.-P. Ma. The competing effects of wall transpiration and stretching on Homann stagnation-point flow. Eur. J. Mech. B-Fluid 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. Phys. Rev. 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. Phys. Rev. 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. Phys. Rev. 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 J. Appl. Dyn. Syst. 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. Eur. Phys. J. B 71, 597-610 (2009).

- C.-H. Yeung, Y.-P. Ma, K. Y. M. Wong. Epoch lifetimes in the dynamics of a competing population. Int. J. Mod. Phys. 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. J. Korean Phys. Soc. 50, 196-200 (2007).

Thesis & Proceedings:

- 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 Semester.

As Module Tutor at Northumbria University:

- KL3005 – Logic and Algorithms (Mathematics Year 0): F17, S18
- KC4012 – Computational Mathematics (Mathematics Year 1): S17, F17, S18
- KC5026 – Applied Modeling (Mathematics Year 2): S17

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

RESEARCH SUPERVISION

PhD:

- David Snee (Sep 2017 –)

Master:

- Richard Cook (Jan 2018 – May 2018)

Undergraduate:

- Rachel Simmons (Oct 2018 – May 2019)
- Dan Edwards (Sep 2017 – Mar 2018)

PROFESSIONAL ACTIVITIES

Journals refereed

- Physica D
- SIAM Journal on Applied Dynamical Systems
- Chaos
- Nonlinearity
- Chinese Journal of Physics
- Optical and Quantum Electronics
- Nonlinear Dynamics

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

- 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