

JINGMIN XIA

College of Meteorology and Oceanography, National University of Defense Technology, China
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EDUCATION/POSITION

College of Meteorology and Oceanography, National University of Defense Technology
Associate Professor 12/2023 –
Lecturer 10/2021 – 11/2023
Mathematical Institute, University of Oxford 10/2017 – 07/2021
D.Phil. in EPSRC Centre for Doctoral Training in Partial Differential Equations
Thesis: Computational and Analytical Aspects of Energy Minimisation Problems in Cholesteric, Ferronematic and Smectic Liquid Crystals
Supervisor: Prof. Patrick E. Farrell
School of Mathematics, University of Warwick 10/2015 – 06/2016
Visiting undergraduate student. Grade: 72.63% (first class)
Supervisor: Prof. Colin Sparrow
College of Science, National University of Defense Technology 09/2012 – 07/2016
Bachelor of Science, Applied Mathematics. Grade: 88.7/100 (top student)
Thesis: CPR Method and its Applications in Traffic Flow
Supervisor: Prof. Songhe Song

PUBLICATIONS

- J. Xia** and Y. Han. *A simple tensorial theory of smectic C liquid crystals*, submitted, 2024.
- Ren Wittmann, Paul A. Monderkamp, **J. Xia** et al. *Colloidal smectics in button-like confinements: experiment and theory*, Physical Review Research, 5(3), pp. 1-15, 2023.
- J. Xia**, Computing and Analysing Energy Minimisation Problems in Liquid Crystals – Implementation using Firedrake, World Scientific, 2023.
- J. Lv, J. Shi, W. Zhang, **J. Xia** and Q. Wang. *Numerical simulations on waves in the Northwest Pacific Ocean based on SWAN models*, Journal of Physics Conference Series, 2486(1): 012034, pp. 1-11, 2023.
- Q. Wang, J. Shi, **J. Xia** et al. *Influence of wave-induced radiation stress on upper-layer ocean temperature during typhoons*, Remote Sensing, 15(9):2442, pp. 1-21, 2023.
- J. Xia** and P. E. Farrell. *Variational and numerical analysis of a Q-tensor model for smectic-A liquid crystals*, ESAIM: Mathematical Modeling and Numerical Analysis, 57(2), pp. 1-24, 2023.
- J. Dalby, P. E. Farrell, A. Majumdar and **J. Xia**. *One-dimensional ferronematics in a channel: order reconstruction, bifurcations and multistability*, SIAM Journal on Applied Mathematics, 82 (2), 2022, pp.694-719.
- J. Xia**, S. MacLachlan, P. E. Farrell and T. J. Atherton. *Structural landscapes in geometrically frustrated smectics*, Physical Review Letters, 126, 177801, 2021, pp.1-6.
- J. Xia**, P. E. Farrell and F. Wechsung. *Augmented Lagrangian preconditioners for Oseen–Frank models in nematic and cholesteric liquid crystals*, BIT Numerical Mathematics, 10.1007/s10543-020-00838-9, 2021, pp.1-38.
- J. Xia**, P. E. Farrell and S. G. P. Castro. *Nonlinear bifurcation analysis of stiffener profiles via deflation techniques*, Thin-Walled Structures, 149 (2020), pp. 1-11, 10.1016/j.tws.2020.106662.

M. Song, X. Qian, H. Zhang, **J. Xia** and S. Song, *Two kinds of new energy-preserving schemes for the coupled nonlinear Schrödinger equations*, Communications in Computational Physics, 25 (4) (2019), pp. 1127–1143, [10.4208/cicp.OA-2017-0212](https://doi.org/10.4208/cicp.OA-2017-0212).

J. Xia, Z. Xu and D. Hu. *Flocking in a two-agent system with processing delay*, Mathematics in Practice and Theory (Chinese), 18 (2016), pp. 264–270.

J. Xia, J. Sun, T. Fang, X. Zhang and J. Fang. *Linear optical properties of gold colloid*, Materials Science, 21 (2015). 10.5755/j01.ms.21.4.9558.

RESEARCH EXPERIENCE

Analysis of a Novel Mathematical Model for Smectic A Liquid Crystals 2021 Supervisor: Prof. Patrick Farrell

Landau–de Gennes Theory for Modeling Smectic A Liquid Crystals 2020 Supervisor: Prof. Patrick Farrell

Augmented Lagrangian Preconditioners for Oseen–Frank Models in Cholesteric Liquid Crystals 2019 Supervisor: Prof. Patrick Farrell

Implementation and Bifurcation Analysis of Saint Venant–Kirchhoff Hyperelastic Models for Aircraft Stiffeners 06/2018 - 09/2018

PDE CDT Mini-Project 2

Supervisor: Prof. Patrick Farrell

Construction, Implementation and Analysis of Variational Integration Schemes for the Wave Equation 01/2018 - 04/2018

PDE CDT Mini-Project 1

Supervisor: Prof. Sina Ober-Blöbaum

Flocking in a Two-Agent System with Processing Delay 2015

National Innovation Projects for Undergraduate Students

Supervisor: Prof. Xiao Wang

Linear Optical Properties of Gold Colloid 2014

Student Research Assistant

Supervisor: Prof. Jingyue Fang

SELECTED AWARDS AND GRANTS

Young Elite Scientists Sponsorship Program by CAST 08/2023 - 08/2026

Science and Technology Innovation Program of Hunan Province 07/2023 - 07/2026

Hunan Provincial Natural Science Fund for Excellent Youths 01/2023 - 12/2025

National Natural Science Foundation of China 01/2023 - 12/2025

Research Fund of National University of Defense Technology 07/2022 - 06/2025

The Keble Association Grant 2019-20 12/2019

Awarded: Study Awards

National Mathematical Contest in Modeling for Graduates, China 12/2016

Awarded: Second Prize

Mathematical Contest in Modeling (MCM/ICM), USA 02/2014

Awarded: Honorable Mention

Mathematical Contest in Modeling for Undergraduates in Hunan Province, China 2014

Awarded: Third Prize

TEACHING

Spring term 2024: Lecturing Numerical Ocean Prediction

Autumn Term, 2023: Lecturing Fundamentals of Oceanography

Autumn Term, 2022: Tutoring Numerical Ocean Prediction

MT 2019: Numerical Solution of Differential Equations I

MT 2019: Numerical Solution of Differential Equations I

MT 2019: Marking the Math Admission Test 2019

HT 2020: Numerical Solution of Differential Equations II

HT 2020: Tutoring the collection (Numerical Solution of Differential Equations) in Lincoln College

COMPUTER SKILLS

Modeling & Analysis	Python, Firedrake, Mathematica, Matlab
Software & Tools	L ^A T _E X, ParaView, Git

PERSONAL WEBSITE

Please check out [my personal website](#) for more recent updates.