

RUI ZHANG

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EDUCATION

PhD Physics, City University of New York Sep 2013
Graduate Center & City College, with Prof. Joel Koplik
BS Physics, Fudan University Jul 2007
Department of Physics

PROFESSIONAL EXPERIENCE

Assistant Professor Mar 2020 – present
Department of Physics
The Hong Kong University of Science and Technology
Affiliate Member Feb 2024 – present
The International Institute for Sustainability with Knotted
Chiral Meta Matter
Hiroshima University
Distinguished Research Associate May 2018 – Mar 2020
Pritzker School of Molecular Engineering
The University of Chicago
Postdoctoral Scholar, with Prof. Juan J. de Pablo Jan 2014 – May 2018
Pritzker School of Molecular Engineering
The University of Chicago
Research Assistant & Adjunct Lecturer Sep 2009 – Dec 2013
Levich Institute & Physics Department
City College of New York

RESEARCH INTERESTS

Theoretical & Computational Soft Matter Physics: Liquid Crystals; Active Matter;
Micro/Nanofluidics; Polymer Physics; Colloids; Mechanical Metamaterials.

SELECTED PUBLICATIONS†

1. Weiqiang Wang, Haijie Ren and **Rui Zhang**#, Symmetry Breaking of Self-Propelled Topological Defects in Thin-Film Active Chiral Nematics, *Phys. Rev. Lett.* **132**, 038301 (2024).
2. Chung Wing Chan*, Daihui Wu*, Kaiyao Qiao, Kin Long Fong, Zhiyu Yang, Yilong Han and **Rui Zhang**#, Chiral Active Particles are Sensitive Reporters to Environmental Geometry, *Nat.*

- Commun.* **15**, 1406 (2024). Featured in “Applied physics and mathematics” by *Nature Communications* and reported in HKUST SSCI Research Newsletter and Departmental News.
3. Xinyu Wang*, Jinghua Jiang*, Juan Chen*, Asilehan Zhawure, Wentao Tang, Chenhui Peng# and **Rui Zhang**#, Moiré Effect Enables Versatile Design of Topological Defects in Nematic Liquid Crystals, *Nat. Commun.* **15**, 1655 (2024).
 4. Haijie Ren, Weiqiang Wang, Wentao Tang and **Rui Zhang**#, Machine Eye for Defects: Machine Learning-Based Solution to Identify and Characterize Topological Defects in Textured Images of Nematic Materials, *Phys. Rev. Research* **6**, 013259 (2024).
 5. Yulu Huang, Weiqiang Wang, Jonathan K. Whitmer and **Rui Zhang**#, Structures, Thermodynamics and Dynamics of Topological Defects in Gay–Berne Nematic Liquid Crystals, *Soft Matter* **19**, 483–496 (2023). Featured in collection “Soft Matter Emerging Investigators Series”.
 6. **Rui Zhang***, Steven Redford*, Paul Ruijrok, Nitin Kumar, Ali Mozaffari, Sasha Zemsky, Aaron Dinner, Vincenzo Vitelli, Zev Bryant, Margaret Gardel and Juan J. de Pablo, Spatiotemporal Control of Liquid Crystal Structure and Dynamics Through Activity Patterning, *Nature Materials* **20**, 875–882 (2021).
 7. **Rui Zhang***, Nitin Kumar*, Jennifer Ross, Margaret L. Gardel and Juan J. de Pablo, Interplay of Structure, Elasticity and Dynamics in Actin-Based Nematic Materials, *Proc. Natl. Acad. Sci. U. S. A.* **115** (2) E124–E133 (2018).
 8. **Rui Zhang**, Ye Zhou, Mohammad Rahimi and Juan J. de Pablo, Dynamic structure of active nematic shells, *Nat. Commun.* **7**, 13483 (2016). Featured in “Active Matter” collection by Nature Portfolio.
 9. **Rui Zhang**, Samaneh Farokhirad, Taehun Lee and Joel Koplik, Multiscale liquid drop impact on wettable and textured surfaces, *Phys. Fluids* **26**, 082003 (2014).
 10. **Rui Zhang** and Joel Koplik, Separation of Nanoparticles by Flow past a Patterned Substrate, *Phys. Rev. E* **85**, 026314 (2012). Reported in APS Synopsis.

† Full publication list can be found in Google Scholar.

* Equal contribution; # Corresponding author.

SELECTED RESEARCH GRANTS

PI, “*Investigation of Emergent Patterns and Elastic Waves in Active Soft Solids*”, NSFC-RGC Joint Research Scheme, 2024–2027.

PI, “*Computational Study of Three-dimensional Hydrodynamics of Active Liquid Crystals on Interfaces*”, Hong Kong RGC GRF, 2025–2027.

PI, “*Computational Study of Viscoelastic Active Matter*”, Hong Kong RGC GRF, 2022–2024.

PI, “*Computational Design of Multiphysics Coupled Three-Dimensional Liquid Crystal Elastomers*”, Guangdong Natural Science Foundation, 2022–2024.

PI, “*Multi Scale Study of Chiral Active Matter*”, Hong Kong RGC ECS, 2020–2023.

HONORS

Liquid Crystal Gordon Research Conference “*Most Active Discussion Participant*”, 2019.

Fudan University “*Wang Dao*” Fellowship, 2007.