RAN NI

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PERSONAL PARTICULARS

Gender: Male
Date of birth: August 1984
Nationality: Chinese, Singapore Permanent Resident

ACADEMIC QUALIFICATION

- September 2008 – July 2012: PhD in Physics, Debye Institute for Nanomaterials Science, Utrecht University, The Netherlands
- September 2005 – July 2008: M.S in Chemical Engineering, Beijing University of Chemical Technology (BUCT), China
- September 2001 – July 2005: B.S. in Mathematics, Beijing University of Chemical Technology, China

WORK EXPERIENCES

- 2021 – now: Tenured Associate Professor in the School of Chemistry, Chemical Engineering and Biotechnology in Nanyang Technological University in Singapore
- 2016 – 2021: Tenure Track Assistant Professor in the School of Chemical & Biomedical Engineering in Nanyang Technological University in Singapore
- 2014 – 2016: NWO VENI Research Fellow at University of Amsterdam (Principal Investigator)
- 2012 – 2014: Post-Doctoral researcher working with Prof. P. G. Bolhuis (Amsterdam) and Prof. M. A. Cohen Stuart (Wageningen)

AWARDS AND GRANTS

- 2024: Tan Chin Tuan Exchange Fellow in Engineering by College of Engineering in Nanyang Technological University, Singapore.
- 2024-2026: Academic Research Fund Tier 1 by Ministry of Education, Singapore
- 2023-2028: Team-PI of the Competitive Research Programme (CRP) grant "Directed Energy Materials (DEM) for Advanced Manufacturing" by National Research Foundation, Singapore (NRF)
- 2020-2023: Academic Research Fund Tier 2 by Ministry of Education, Singapore
- 2021-2023: Academic Research Fund Tier 1 by Ministry of Education, Singapore
- 2021-2022: A*STAR-P&G Joint grant call – DigiSolutions Accelerator Grant Wave 2
- 2021-2022: Imperial College – NTU Collaboration Fund
- 2017-2019: Academic Research Fund Tier 1 by Ministry of Education, Singapore
- 2017-2021: Advanced Manufacturing and Engineering Young Individual Research Grant by A*STAR Science & Engineering Research Council (SERC), Singapore
- 2016-2018: Academic Research Fund Tier 1 by Ministry of Education, Singapore
- 2016: **Best Research Prize** by the European Cooperation in Science and Technology (COST) Action – Flowing Matter [An annual prize for European Early Stage Researchers in soft matter within eight years after the date of PhD]
- 2014: **NWO VENI Talent Personal Grant**
- 2011: Chinese Government Award for **Outstanding Self-financed Students Abroad**

- 2008: Elected to be the **Academic Stars of Graduates** in BUCT
- 2005: The **First Prize** in National Postgraduates Mathematical Contest in Modeling in China
- 2005: The Scholarship of Out School in BUCT, National Prize
- 2004: The **Honorable Mention** in International Mathematical Contest in Modeling,
- 2003: The Excellent Student in the Faculty of Science in BUCT.
- 2002: **The Cup of Higher Education Press** (Champion) in National Wide Mathematical Contest in Modeling in China
- 2002: The Champion in Mathematical Contest in Modeling in BUCT

RESEARCH INTERESTS

- Non-equilibrium hyperuniform fluids
- Programmable self-assembly of DNA coated colloids
- Vitrimers based biomaterials
- Deep learning assisted computational physics
- Dynamic assembly of active colloids
- Self-assembly of fibril-forming polypeptides
- Nucleation, equilibrium phase behavior, and glass transition in colloidal systems
- Equilibrium self-assembly of photonic metamaterials using anisotropic colloids

SERVICE

- Associate Editor of National Science Open
- Editorial Board Member of *npj* Soft Matter
- Guest Associate Editor and Editorial Board Member of Frontiers in Physics
- Member of Young Scientist Committee of Chinese Physics Letters and Chinese Physics B, Acta Physica Sinica and Physics.

REVIEWER FOR SCIENCE FOUNDATIONS

- European Research Council (starting grant and consolidator grant)
- National Science Foundation, USA
- Austrian Science Fund
- Israel Science Foundation
- Dutch Research Council (NWO)

CONFERENCES AND WORKSHOPS ORGANIZED

- The 16th Pacific Polymer Conference, Singapore, December 2019 (Organizing committee member)
- 2019 International Workshop on Soft Matter and Biophysics Theories, Beijing, China, May 2019
- Designer Soft Matter, Singapore, June 2018

RECENT INVITED TALKS

- Keynote Speaker for The 10th International Conference on Nanoscience and Technology, Beijing, China, August 2025
- Invited Speaker for the CECAM workshop “Physics of mesoscale liquid condensates”, Liyang, China, November 2024
- Invited Speaker for The 14th International Symposium on Polymer Physics, Chongqing, China, June 2024
- Keynote Speaker for The 7th International Soft Matter Conference, Osaka, Japan, September 2023
- Invited Speaker for the CECAM workshop “Emerging colloidal dynamics away from equilibrium. Chiral active systems”, Lausanne, Switzerland, March 2023

- Invited Speaker for "Frontiers in Non-equilibrium Physics", Institute of Mathematical Sciences, Chennai, India, January 2023
- Invited Speaker for "KAIST CBE International Symposium on Soft Matter", Daejeon, South Korea, November, 2022
- Invited Speaker for APS March Meeting Symposia "Disordered Hyperuniform Materials: Discovery and Design", March 2022
- Invited Speaker for Pacifichem 2021, Honolulu, Hawaii, December 2021
- Invited Speaker for the Conference of Condensed Matter Physics, Liyang, China, July 2021
- Keynote speaker for the 8th International Conference on Nanoscience and Technology – "ChinaNano 2019", Beijing, China, August 2019
- Invited Speaker for the CECAM workshop "Emerging behaviour in active matter: computational challenges", Lincoln, UK, June 2019
- Invited Speaker for the Kavli Institute for Theoretical Sciences Workshop "Out of equilibrium soft matter systems - from driven to active systems", Beijing, China, May 2019
- Invited Speaker for the ICTS workshop "Entropy, Information and Order in Soft Matter", Bangalore, India, August 2018
- Invited Speaker for the Conference of Condensed Matter Physics, Shanghai, China, July 2018

LIST OF SELECTED PUBLICATIONS (*CORRESPONDING AUTHOR, # EQUAL CONTRIBUTION)

1. Xiuyang Xia#, Yuhan Peng#, Ka Ki Li, and Ran Ni*, Designed self-assembly of programmable colloidal atom-electron equivalents, ***Rep. Prog. Phys.,*** 88, 078101 (2025)
2. Siyu Wan#, Xiuyang Xia#, Yutong Gao, Heyang Zhang, Zhebin Zhang, Fangyue Xu, Dong Yang, Tongtao Li*, Jianfeng Li*, Ran Ni*, and Angang Dong*, Curvature-guided depletion stabilizes Kagome superlattices of nanocrystals, ***Science***, 387, 978 (2025) [Highlighted by ***Science***]
3. Jian Liang#, Xuan Feng#, Ning Zheng, Huaguang Wang*, Ran Ni* and Zexin Zhang*, Glass Transition in Monolayers of Rough Colloidal Ellipsoids, ***Phys. Rev. Lett.***, 134, 038202 (2025) [Highlighted as ***Editors' Suggestion***, featured in ***Physics*** and interviewed in ***Phys.org***]
4. Solomon Asghar, Qing-Xiang Pei, Giorgio Volpe* and Ran Ni*, Efficient Rare Event Sampling with Unsupervised Normalising Flows, ***Nature Machine Intelligence***, 6, 1370 (2024)
5. Qionghai Chen#, Xiuyang Xia#, Wanhui Huang, Liqun Zhang, Ran Ni* and Jun Liu*, Topological programmability of isomerizable polymers, ***Phys. Rev. Lett.***, 133, 048101 (2024)
6. Xiuyang Xia, and Ran Ni*, Designing superselectivity in linker-mediated multivalent nanoparticle adsorption, ***Phys. Rev. Lett.***, 132, 118202 (2024)
7. Xiaoxia Li#, Huang Fang#, Krongtum Sankaewtong#, Minhua Li, Yanshuang Chen, Jiping Huang, Ran Ni*, Hajime Tanaka* and Peng Tan*, Phase reentrances and solid deformations in confined colloidal crystals, ***Phys. Rev. Lett.***, 132, 018202 (2024)
8. Yusheng Lei, and Ran Ni*, How does a hyperuniform fluid freeze?, ***Proc. Natl Acad. Sci. USA***, 120, e2312866120 (2023)
9. Tianran Zhang, Dengping Lyu, Wei Xu, Xuan Feng, Ran Ni*, and Yufeng Wang*, Janus Particles with Tunable Patch Symmetries and their Assembly into Chiral Colloidal Clusters, ***Nature Communications***, 14, 8494 (2023) [Highlighted as the ***Editor's Highlights***]
10. Qunli Lei, Feng Tang, Jidong Hu, Yuqiang Ma*, and Ran Ni*, Duality, hidden symmetry and dynamic isomerism in 2D hinge structures, ***Phys. Rev. Lett.***, 129, 125501(2022)
11. Tongtao Li#, Xiuyang Xia#, Guanhong Wu, Qingfu Cai, Xuanyu Lyu, Jing Ning, Jing Wang, Min Kuang, Yuchi Yang, Massimo Pica Ciamarra, Ran Ni*, Dong Yang* and Angang Dong*, Mismatched ligand density enables ordered assembly of mixed-dimensional, cross-species materials, ***Science Advances***, 8, eabq0969 (2022)
12. Qunli Lei#, Wei Zheng#, Feng Tang, Xiangang Wan, Ran Ni*, and Yuqiang Ma*, Self-Assembly of Isostatic Self-Dual Colloidal Crystals, ***Phys. Rev. Lett.***, 127, 018001 (2021)

13. Qunli Lei[#], Xiuyang Xia[#], Juan Yang, Massimo Pica Ciamarra, Ran Ni*, Entropy-Controlled Cross-Linking in Linker-Mediated Vitrimers, ***Proc. Natl Acad. Sci. USA***, 117, 27111 (2020)
14. Xiuyang Xia, Hao Hu, Massimo Pica Ciamarra*, Ran Ni*, Linker-mediated self-assembly of mobile DNA coated colloids, ***Science Advances***, 6, eaaz6921 (2020)
15. Qunli Lei and Ran Ni*, Hydrodynamics of random-organizing hyperuniform fluids, ***Proc. Natl Acad. Sci. USA***, 116, 22983 (2019)
16. Qunli Lei, Massimo Pica Ciamarra*, Ran Ni*, Non-Equilibrium Strongly Hyperuniform Fluids of Circle Active Particles with Large Local Density Fluctuations, ***Science Advances***, 5, eaau7423 (2019)
17. Hao Hu, Pablo Sampedro Ruiz, Ran Ni*, Entropy stablizes noncompact crystals of mobile DNA coated colloids, ***Phys. Rev. Lett.*** 120, 048003 (2018)
18. Ran Ni*, Martien A. Cohen Stuart, and Peter G. Bolhuis, Tunable long range forces mediated by self-propelled colloidal hard spheres, ***Phys. Rev. Lett.***, 114, 018302 (2015) [Highlighted as ***Editors' Suggestion***]
19. Ran Ni*, Martien A. Cohen Stuart, and Marjolein Dijkstra, Pushing glass transition towards random close packing using self-propelled hard spheres, ***Nature Communications***, 4, 2704 (2013)
20. Ran Ni*, Sanne Abeln, Marieke Schor, Martien A. Cohen Stuart, and Peter G. Bolhuis, Interplay between folding and assembly of fibril-forming polypeptides, ***Phys. Rev. Lett.***, 111, 058101 (2013)
21. Ran Ni*, Anjan P. Gantapara, Joost de Graaf, René van Roij and Marjolein Dijkstra*, Phase diagram of colloidal hard superballs: from cubes via spheres to octahedra, ***Soft Matter***, 8, 8826 (2012) [Cover story]
22. Ran Ni, Simone Belli, René van Roij and Marjolein Dijkstra; Glassy dynamics, spinodal fluctuations, and the kinetic limit of nucleation in suspensions of colloidal hard rods; ***Phys. Rev. Lett.***, 105, 088302 (2010)