

Andreas Neophytou

✉ andreas.neophytou@uniroma1.it 🌐 <https://andneo.github.io>

Education

- | | |
|---------------------|---|
| Mar 2019 - Mar 2023 | University of Birmingham
<i>PhD, Chemistry – Designing Colloidal Open Crystals & Empty Liquids</i> <ul style="list-style-type: none">The project involved the development of computational methods to model colloidal systems and understand their self-assembly. |
| Sep 2017 - Feb 2019 | University of Birmingham
<i>M.Sc. by Research, Chemistry</i> <ul style="list-style-type: none">The aim of the project was to design a model system of patchy colloidal rods (<i>in-silico</i>) that are able to crystallise into photonic crystals. |
| 2012 - 2017 | University of Birmingham
<i>B.Sc. Natural Sciences with a Year in Computer Science, Class I (81%)</i> <ul style="list-style-type: none">Double major, focusing on Biochemistry and Chemistry.Final year research project explored the use of quaternions to improve the performance of optimisation algorithms.Awarded prizes for achieving the highest overall marks for the cohort in the final year and having the “best” final year research project. |

Research Experience

- | | |
|---------------------|--|
| Jul 2023 - Present | Postdoctoral Researcher, Dipartimento di Fisica, Sapienza Università di Roma <ul style="list-style-type: none">Supervised by Professors Francesco Sciortino and John Russo.The project focuses on using theory and computer simulations to understand exotic phase transitions in network forming systems. |
| Jan 2022 - Jan 2023 | Fellow in Applied Physics, Harvard School of Engineering and Applied Science <ul style="list-style-type: none">Hosted by Professor Vinothan Manoharan.The project focused on developing computational models, in collaboration with the Manoharan group, to understand the physics underpinning the successful self-assembly of viral capsids in <i>in-vitro</i> experiments. |
| Jul 2017 - Sep 2017 | PRACE Summer of High Performance Computing Participant <ul style="list-style-type: none">2-month project at the Computing Centre of the Slovak Academy of Sciences.The project goal was to parallelise the band structure calculations of nanotubes using MPI.Provided experience with parallel programming using MPI and OpenMP. |
| Oct 2015 - May 2016 | IMechE Railway Challenge Team Member for the University of Birmingham <ul style="list-style-type: none">Work with other team members to construct a working locomotive. |
| Jul 2014 - Sep 2014 | Leukaemia & Lymphoma Summer Research Project, University of Birmingham <ul style="list-style-type: none">10-week project funded by the Leukaemia & Lymphoma Research charity.The project goal was to see how miRNA expression changes in leukaemic cells following combined treatment with bezafibrate and medroxyprogesterone acetate.The project provided experience with various molecular biology techniques and working independently in a research environment. |

Teaching Experience

- | | |
|-------------|---|
| 2018 - 2021 | Teaching Associate in the School of Chemistry, University of Birmingham <ul style="list-style-type: none">• Prepare and supervise chemistry students during their undergraduate laboratory sessions. |
| 2014 - 2015 | PASS Leader for Biochemists at the University of Birmingham <ul style="list-style-type: none">• Plan and lead one-hour tutorials for a small class of 1st year biochemists. |

Honours and Awards

- | | |
|----------|--|
| Jul 2022 | Langmuir Graduate Student Oral Presentation Awards Recipient
<i>Selected to be one of ten presenters for the special session “Langmuir Graduate Student Oral Presentation Awards Session” at the 96th Annual Colloid and Surface Science Symposium.</i> |
| Mar 2022 | Turing Scheme Grant Recipient
<i>Grant awarded to facilitate the undertaking of research at Harvard as a Fellow of the School of Engineering and Applied Sciences in Professor Vinothan Manoharan’s lab</i> |
| Jul 2017 | Natural Sciences Finalist’s Prize, University of Birmingham
<i>Awarded to the student who has shown the best performance in the final year.</i>
Natural Sciences Dissertation / Project Prize, University of Birmingham
<i>Awarded to the student whose project report or dissertation is deemed, by the Board of Examiners, to be outstanding.</i> |

Invited Talks

- | | |
|-------------|---|
| 30 May 2024 | WaterX
<i>Unravelling the Mysterious Behaviour of Tetrahedral Liquids: The Topological Nature of the Liquid-Liquid Phase Transition</i> |
| 11 Jul 2023 | Physical Networks Workshop
<i>Untangling the Mysteries of Supercooled Water</i> |

Contributed Talks

- | | |
|-------------|---|
| 14 Jul 2025 | 29th International Conference on Statistical Physics <i>Can disorder be designed?</i> |
| 22 Sep 2024 | 12th Liquid Matter Conference <i>Unravelling the Mysterious Behavior of Tetrahedral Liquids: The Topological Nature of the Liquid-Liquid Phase Transition</i> |
| 17 Jul 2023 | UK Colloids 2023 <i>Topological Nature of the Liquid-Liquid Phase Transition</i> |
| 11 Jul 2022 | 96th Annual Colloid and Surface Science Symposium
<i>Unravelling the Mysterious Behavior of Tetrahedral Liquids: The Topological Nature of the Liquid-Liquid Phase Transition</i> |
| 19 Jul 2021 | UK Colloids 2021
<i>Self-Assembly of Colloidal Photonic Crystals Robust to Stacking Faults</i> |
| 12 Jul 2020 | UK Colloids 2020
<i>Facilitating the Formation of Colloidal Photonic Crystals via Hierarchical Self-Assembly</i> |

Publications

- 2025 | 1. **Neophytou, A.**, Sciortino, F. & Russo, J. Designing the Self-Assembly of Disordered Materials Via Color Frustration. *Advanced Materials*, 2502136 (2025).
- 2024 | 2. Zorzi, N., **Neophytou, A.** & Sciortino, F. Two state model for the ML-BOP potential. *Molecular Physics* **122**, e2407025 (2024).
3. **Neophytou, A.**, Starr, F. W., Chakrabarti, D. & Sciortino, F. Hierarchy of topological transitions in a network liquid. *Proceedings of the National Academy of Sciences* **121** (2024).
4. **Neophytou, A.** & Chakrabarti, D. Engineering Rings in Network Materials. *Advanced Physics Research*, 2400007 (2024).
5. **Neophytou, A.** & Sciortino, F. Potential energy landscape of a coarse grained model for water: ML-BOP. *The Journal of Chemical Physics* **160** (2024).
6. Williams, L. A., **Neophytou, A.**, Garmann, R. F., Chakrabarti, D. & Manoharan, V. N. Effect of coat-protein concentration on the self-assembly of bacteriophage MS2 capsids around RNA. *Nanoscale* **16**, 3121–3132 (2024).
- 2023 | 7. Flavell, W., **Neophytou, A.**, Demetriadou, A., Albrecht, T. & Chakrabarti, D. Programmed Self-Assembly of Single Colloidal Gyroids for Chiral Photonic Crystals. *Advanced Materials* **35**, 2211197 (2023).
- 2022 | 8. **Neophytou, A.**, Chakrabarti, D. & Sciortino, F. Topological nature of the liquid–liquid phase transition in tetrahedral liquids. *Nature Physics*, 1–6 (2022).
9. **Neophytou, A.** & Chakrabarti, D. in *Frontiers of Nanoscience* 111–128 (Elsevier, 2022).
- 2021 | 10. **Neophytou, A.**, Chakrabarti, D. & Sciortino, F. Facile self-assembly of colloidal diamond from tetrahedral patchy particles via ring selection. *Proceedings of the National Academy of Sciences* **118** (2021).
11. Xiao, M., Stephenson, A. B., **Neophytou, A.**, Hwang, V., Chakrabarti, D. & Manoharan, V. N. Investigating the trade-off between color saturation and angle-independence in photonic glasses. *Optics Express* **29**, 21212–21224 (2021).
12. **Neophytou, A.**, Manoharan, V. N. & Chakrabarti, D. Self-Assembly of Patchy Colloidal Rods into Photonic Crystals Robust to Stacking Faults. *ACS Nano* **15**, 2668–2678 (2021).
- 2020 | 13. Rao, A. B., Shaw, J., **Neophytou, A.**, Morphew, D., Sciortino, F., Johnston, R. L. & Chakrabarti, D. Leveraging hierarchical self-assembly pathways for realizing colloidal photonic crystals. *ACS Nano* **14**, 5348–5359 (2020).
- 2019 | 14. Ou, Z., Luo, B., **Neophytou, A.**, Chakrabarti, D. & Chen, Q. in *Frontiers of Nanoscience* 61–85 (Elsevier, 2019).