# Daphne Klotsa *Curriculum Vitae* – revision date 03/01/2025

## PERSONAL

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## PROFESSIONAL POSITIONS

University of North Carolina at Chapel Hill — 07/2022 – present
Associate Professor (tenured)
Department of Applied Physical Sciences

University of North Carolina at Chapel Hill — 07/2015 – 07/2022
Assistant Professor
Department of Applied Physical Sciences

University of Cambridge, U.K. — 08/2014 – 06/2015
Marie-Curie IOF Post-doctoral fellow
Daan Frenkel's group, Department of Theoretical Chemistry

Harvard University, Cambridge MA, U.S.A. — 05/2014 – 07/2014
Visiting Scholar
Michael Brenner's group, School of Engineering and Applied Sciences

University of Michigan, Ann Arbor MI, U.S.A. — 08/2011 – 08/2014
Post-doctoral researcher/Marie-Curie IOF Post-doctoral fellow
Sharon Glotzer's group, Department of Chemical Engineering

University of Bath, Bath, U.K. — 06/2009 – 06/2011
Post-doctoral researcher
Robert Jack's group, Department of Physics

## EDUCATION

University of Nottingham, Nottingham U.K. — 01/2005 – 06/2009
Ph.D. Physics (Simulations, theory and experiments)
Thesis: "The dynamics of spheres in oscillatory fluid flows"
Advisors: Michael R. Swift, Roger M. Bowley

University of Warwick, Coventry U.K. — 08/2003 – 12/2004
MSc. in Physics (by Research)
Thesis: "Electronic Transport in DNA"
Advisors: Rudolf A. Roemer and Matthew S. Turner
Department of Physics and Centre for Scientific Computing

University of Warwick, Coventry U.K. — 10/2000 – 06/2003
BSc. (Hons) Physics

## Awards & Honors

- National Science Foundation, NSF-CAREER Award 2018
- University of North Carolina Junior Faculty Development Award
- Elected *member-at-large*, Statistical and Nonlinear Physics Group, American Physical Society.
- Named *2021 Emerging Investigator*, special issue of journal *Soft Matter*.
- Marie-Curie International Outgoing Postdoctoral Fellowship (3-year funding, $272K).

- Boulder School for Condensed Matter Physics 1-month scholarship (07/2011).
- Alexander S. Onassis Public Benefit Foundation four-year PhD Scholarship (2004). (declined).
- University of Nottingham PhD funding (2005-2009).

## BIBLIOGRAPHY, REFEREED PAPERS/ARTICLES

28. Using Activity to Compartmentalize Binary Mixtures. N. Lauersdorf. E. Nazockdast, and D. Klotsa. Submitted, available on the arXiv:2407.07826.
27. Charge distribution and helical content tune the binding of septin?s amphipathic helix domain to lipid membranes. C. J. Edelmaier, S. J. Klawa, S. M. Mofidi, Q. Wang, S. Bhonge, E. J. D. Vogt, B. N. Curtis, W. Shi, S. M. Hanson, D. Klotsa, M. G. Forest, A. S. Gladfelter, R. Freeman, E. Nazockdast. Submitted, available on the bioRxiv.
26. Work in Progress: An "Engineering for Everyone" Class that Incorporates Modeling, Simulation, and Biomimicry into the Engineering Design Process. R. Goldberg, E. Nazockdast and D. Klotsa. Paper presented at *2024 ASEE Annual Conference & Exposition*, Portland, Oregon. 10.18260/1-2–48340.
25. Nonreciprocal model swimmer at intermediate Reynolds numbers. H. Nguyen and D. Klotsa. Submitted, available on the arXiv:2108.00095.
24. Fluid inertia and the scallop theorem. Nicholas J. Derr, Thomas Dombrowski, Chris H. Rycroft and Daphne Klotsa. *JFM* 952 (2022).
23. Pairwise and collective behavior between model swimmers at intermediate Reynolds numbers. T. Dombrowski, H. Nguyen and D. Klotsa. *Phys. Rev. Fluids*, **7**, 074401 (2022).
22. Negative regulation of a ribonucleoprotein condensate driven by dilute phase oligomerization. I. Seim, W. Snead, B. Stormo, A. Posey, D. Klotsa, R. Pappu, and A. Gladfelter. *PNAS* **119** (13) e2120799119 (2022).
21. Phase behavior and surface tension of soft active Brownian particles. N. Lauersdorf, T. Kolb, M. Moradi, E. Nazockdast and D. Klotsa. Invited in *2021 Emerging Investigators* issue of the journal *Soft Matter* **17**, 6337-6351 (2021).
20. Kinematics of a model self-propelled two-sphere swimmer. T. Dombrowski and D. Klotsa. Phys. Rev. Fluids 5, 063103 (2020). Selected Editor's suggestion.
19. Active binary mixtures of fast and slow hard spheres. T Kolb and D. Klotsa. *Soft Matter* **16**, 1967 (2020). Featured on the back cover and as a hot article on the Soft Matter blog.
18. Experiments and agent based models of zooplankton movement within complex flow environments. K. Ozalp, L. Miller, T. Dombrowski, M. Braye, T. Dix, L. Pongracz, R. Howell, D. Klotsa, V. Pasour, C. Strickland. *Biomimetics* **5** (1), 2 (2020).
17. As Above, So Below, and also in Between: Mesoscale active matter in fluids. D. Klotsa. Invited perspective. *Soft Matter* **15**, 8946 (2019). Featured on the inside front cover.
16. Transition in swimming direction in a model self-propelled inertial swimmer. T. Dombrowski, S. K. Jones, G. Katsikis, A. P. S. Bhalla, B. E. Griffith, and D. Klotsa. *Phys. Rev. Fluids* **4**, 021101(R) (2019). Featured in Advances in Engineering
15. Intermediate crystalline structures of colloids in shape space. D. Klotsa, E. R. Chen, M. Engel and S. C. Glotzer. *Soft Matter* **14**, 8692-8697 (2018)). Featured on the inside front cover
14. Clusters of polyhedra in spherical confinement. E. G. Teich, G. van Anders, D. Klotsa, J. Dshemuchadse and S. C. Glotzer. *PNAS* **25**, E669 (2016). Featured in phys.org
13. Propulsion of a Two-Sphere Swimmer. D. Klotsa, K. A. Baldwin, R. J. A. Hill, R. M. Bowley and M. R. Swift. *Phys. Rev. Lett.* **115**, 248102 (2015). Featured in PhysicsToday, and UNC College of Arts & Sciences.

**Prior to UNC-CH**

12. Digital Alchemy for Materials Design and Optimization. G. van Anders, D. Klotsa, A. S. Karas, P. M. Dodd, S. C. Glotzer. *ACS Nano* **9** (10), 9542-9553 (2015).
11. Shape control and compartmentalization in active colloidal cells. M. Spellings, M. Engel, D. Klotsa, S. Sabrinac, A. M. Drews, N. H. P. Nguyen, K. J. M. Bishop and S. C. Glotzer. *PNAS* **112**, no. 34, E4642 (2015). Featured in Nature Physics (Research Highlights). Active colloids: Made to order. Abigail Klopper, *Nature Physics* **11**, 703 (2015).
10. Understanding shape entropy through local dense packing. G. van Anders, D. Klotsa, N. K. Ahmed, M. Engel and S. C. Glotzer, *PNAS* **111**, no 45, E4812–E4821 (2014). Featured on Nature Materials (News and Views) by P. Ball **13**, 1083 (2014) and physics.org (http://phys.org/news/2014-11-geometry-entropy-links-nanostructures-emergent.html).
9. Complexity in surfaces of densest packings for families of polyhedra. E. R. Chen*, D. Klotsa*, M. Engel, P. F. Damasceno and S. C. Glotzer. *Phys. Rev. X* **4**, 011024 (2014). Covered as a Synopsis, physicsworld and New Scientist article.
   *co-first authors
8. Emergent collective phenomena in a mixture of hard shapes through active rotation. N.H.P. Nguyen, D. Klotsa, M. Engel and S. C. Glotzer. *Phys. Rev. Lett.* **112**, 075701 (2014). Featured on the Michigan news.
7. Controlling crystal self-assembly using a real-time feedback scheme. D. Klotsa and R. L. Jack. *J. Chem. Phys.* **138**, 094502 (2013).
6. Predicting the self-assembly of a model colloidal crystal. D. Klotsa and R. L. Jack. *Soft Matter* **7**, 6294 (2011).
5. The dynamics of spheres in oscillatory fluid flows. M.R. Swift, D. Klotsa, H.S. Wright, R.M. Bowley and P.J. King. *Powders and Grains 2009, AIP Conf. Proc.* **1145,** 1039 (2009).
4. Chain formation of spheres in oscillatory fluid flows. D. Klotsa, M.R. Swift, R.M. Bowley and P.J. King. *Phys. Rev. E* **79,** 021302 (2009).
3. Interaction of spheres in oscillatory fluid flows. D. Klotsa, M.R. Swift, R.M. Bowley and P.J. King. *Phys. Rev. E* **76,** 056314 (2007).
2. Electronic transport in DNA – the disorder perspective. D. Klotsa, R. A. Romer and M.S. Turner. *AIP Conf. Proc.* **772,** 1093 (2005).
1. Electronic transport in DNA. (112 citations). D. Klotsa, R. A. Romer and M.S. Turner. *Biophys. J.* **89,** 2187 (2005).

## GRANTS

**Funded**

• Lead PI.
Co-PI's: John Brady (Caltech), David Pine (NYU)
Proposal title: Active Assisted Assembly of Colloidal-based Materials
Department of Energy, Biomaterials Program Total amount: $1.3M
Award period covered: 08/01/2022-01/31/2025

• Lead PI
Proposal title: From Single Swimmers to Swarms: a Computational Study of Mesoscale Active Matter in Fluids
NSF–Faculty Early Career Development Program (CAREER), Directorate of Materials Research (DMR), Program on Condensed Matter Materials Theory (CMMT).
Award number: 1753148
Total amount: $499,997
Award period covered: 03/01/18–02/28/23

• Lead PI.
Co-PI's: Laura Miller, Virginia Pasour.

Proposal title: Mathematical Models of the Individual and Collective Fluid Dynamics of Brine Shrimp Swimming
Department of Defense (DOD) US Army Research Office, Mathematical Sciences
Award number: 77194-MA-SR
Total amount: $\$276,267$
Award period covered: 06/01/2020-05/31/2023

• Lead PI.
Proposal title: Inspiring future robotics: experiments and modeling self-propulsion in tiny shrimp
Submitted to: UNC Junior Faculty Development Awards
Total amount awarded: $\$10,000$

• co-PI.
Co-PI's: Ronit Freeman (Lead), Amy Gladfelter, Klaus Hahn, Richard Baker, Greg Forest, Ehssan Nazockdast.
Proposal title: Regulate Signaling of material EnseMBLEs (RESEMBLE)
Sloan foundation collaborative grant
Total amount awarded: $1.5M

• co-PI.
Co-PI's: Greg Forest (Lead), Peter Mucha.
Proposal title: A Network Science Integrated Feedback Loop for Design of Multifunctional Polymeric Rod-Like Nanocomposites; Source of support: DOD DA ARO;Total award amount: $550,794; Award period covered: 6/10/2016-04/2018

**Invited Department Seminars**

**From UNC-CH**

• 2023/11/29 Computations in Science, Physics Department, University of Chicago.
• 2023/11/17 Computational Mathematics Seminar, Department of Applied Math, University of Wisconsin.
• 2023/10/19 Complex Matter and Biophysics seminar, Department of Physics, North Carolina State University.
•2023/06/13 Soft Matter group seminar, DAMTP, Cambridge, UK (online)
•2021/05/17 Physics Underlying Life Sciences Group, Friedrich Alexander University Erlangen-Nürnberg, Germany.
•2021/04/13 Centre for Theoretical & Computational Physics, Lisbon University, Portugal.
•2020/12/03 Fluids and Materials seminar, Bristol, UK.
•2020/10/23 Department of Mechanical Engineering, Fluids seminar, UIUC.
•2020/09/10 Department of Materials Science and Engineering, Cornell.
•2019/09/18 Department of Physics, University of Pennsylvania.
•2019/05/01 Department of Physics, UCSD.
•2019/04/17 Department of Chemical & Biological Engineering, RPI.
•2019/02/15 Department of Applied Math, CU Boulder.
•2019/02/01 Courant Institute, NYU.
•2018/04/25 Differential Equations/Nonlinear Analysis seminar, Department of Mathematics, North Carolina State University.
•2018/03/20 Fluids group seminar, School of Engineering, Brown.
•2018/02/09 Department seminar, School of Molecular Sciences, Arizona State University.
•2017/06/02 Civil and Environmental Engineering, Stanford.
•2017/05/24 Shawn Douglas Group, Cellular Molecular Pharmacology, UCSF.
•2017/04/11 Physical Applied Math, MIT.
•2016/12/14 Soft Matter Group, Physics, NYU.
•2016/12/13 Chemical Engineering, Columbia, NY.
•2016/12/12 Simon's Foundation, NY.
•2016/12/01 Department of Physics, University of Virginia.

**Invited conference talks**

• 2023/06/4-7 97th ACS Colloid and Surface Science Symposium, Raleigh, NC.
• 2023/05/15 Triangle Soft Matter, University of North Carolina at Chapel Hill.
• 08/13-18/2023 (Discussion Leader) Soft Condensed Matter Physics Gordon Research Conference, Colby-Sawyer College, NH.
• 03/2023 American Physical Society March Meeting, Session: Dense Active Matter: From Fluid to Solid, Las Vegas, NV.
• 02/10/2023 Biological Physics/Physical Biology (BP/PB) online seminar series
• 2023/01/18 Statistical Mechanics and Thermodynamics Group Webinar from the Royal Society of Chemistry
• 2022/09/30 Statistical Thermodynamics and Molecular Simulations Virtual Seminar Series
• 06/26-07/01/2022 (Discussion Leader) Granular Matter Gordon Research Conference, Stonehill College, MA.
•03/2022 American Physical Society, March Meeting, *Session: Active Colloids I.*, Chicago, IL.
• 01/07-09/2022 Berkeley Statistical Mechanics Meeting, Berkeley, CA.
• 11/07-12/2021 *Spotlights in Thermodynamics and Computational Molecular Science (Invited Session)*, Annual meeting of the American Institute of Chemical Engineers AIChE 2021.
•13/04/2021 Thematic Einstein Semester on Geometric and Topological Structure, Berlin Mathematics Research Center, Berlin, Germany.
• 11/16/2020 *Spotlights in Thermodynamics and Computational Molecular Science (Invited Session)*, Annual meeting of the American Institute of Chemical Engineers AIChE 2020.
•05/18-20/2020 Systems Chemistry, Life-like emergent behavior in complex molecules and ensembles. Virtual Symposium. Nanoscience Initiative, Advanced Science Research Center.
•05/13-17/2019 Optimal Design of Soft Matter, Isaac Newton Institute for mathematical sciences, Cambridge, UK.
•03/2019 American Physical Society, March Meeting, GSOFT short course *Structures and Order in Soft Matter Physics.*
•03/2019 American Physical Society, March Meeting, *Session L53: Controlling Local Structure With Time-Dependent External Fields.*
•10/26/2018 *11th Biennial Carolina Biophysics Symposium.*
•07/27/2018 *3rd annual Soft Matter Day*, UMass Amherst.
•07/09-13/2018 *Mathematical aspects of programmable self-assembly*, SIAM conference on Materials Science, Portland, Oregon.
•06/2018 30th International Conference on Science and Technology of Complex Fluids (ICSTCF2018), San Luis Potosi, Mexico.
•11/2017 American Physical Society, Division of Fluid Dynamics (APS-DFD), Mini-symposium on *Life processes at biologically intermediate Reynolds numbers* Denver, Colorado.
•11/2017 RTP180:Nanotechnology, Invited public event at the Research Triangle Park.
•04/2017 14th Ann. Conference on Foundations of Nanoscience: Self-Assembled Architectures and Devices (FNANO17), Snowbird, Utah.
•07/2016 Granular Matter Gordon Research Conference, Stonehill College, Easton, MA.
•05/2016 Triangle Soft Matter Workshop 2016, Duke University.
•01/2016 Dynamics Days 2016, Durham, NC.

**Invited seminars**

**<u>Prior to UNC-CH</u>**

•06/2015 School of Mathematical Sciences, Queen Mary.
•04/2015 Physics Department, University of Bath.
•04/2015 Chemical & Biomolecular Engineering, Johns Hopkins.
•03/2015 Physics Department, UNC-Chapel Hill.
•03/2015 Physics Department, Duke University.
•03/2015 Physics Department, Johns Hopkins.
•03/2015 Chemical and Petroleum Engineering, University of Pittsburgh.
•03/2015 Chemical and Biological Engineering, Northwestern.
•03/2015 Chemical Engineering, University of Oklahoma.
•10/2014 Lunch Seminar Series, Chemistry Department, University of Cambridge.

•07/2014 Chemical Engineering Department, North Carolina State University.
•06/2014 Squishy Physics Seminar, Physics Department, Harvard.
•04/2014 Chemical Engineering Department, University of Texas at Austin.
•10/2012 Physics Colloquium, Wesleyan University.
•03/2012 Widely Applied Math (WAM) Seminar, SEAS, Harvard.
•03/2011 Soft Matter Group Seminar, University of Pennsylvania.
•11/2010 Complex Matter and Biophysics Seminar, North Carolina State.
•11/2010 Soft Matter Seminar, University of Bristol.
•04/2010 Centre for Nonlinear Mechanics, CNM, University of Bath.
•05/2009 Theory Group Seminar, Physics Department, University of Warwick.

**Invited conferences**

•02/2015 Unifying Concepts in Glass Physics VI, Aspen Center for Physics, Aspen, CO.
•02/2014 27th annual Workshop on Recent Developments in Computer Simulation Studies in Condensed Matter Physics, University of Georgia.
•02/2005 TransDNA, Transport in and Computing with DNA, MIR@W-DAY, Centre for Scientific Computing, University of Warwick.
•05/2013 Emerging Leaders Session: Gordon Research Conference, Self-assembly and Supramolecular Chemistry, Les Diablerets, Switzerland.

**Contributed oral presentations**

**From UNC-CH**

•06/5-7/2023 ACS Colloids, NCSU, NC
•10/24/2019 Society of Rheology International Meeting, Raleigh, NC.
•01/2018 Fundamentals Problems in Active Matter, Aspen Center for Physics, Colorado.
•11/2016 American Physical Society, Division of Fluid Dynamics Annual Meeting, Portland.
•06/2016 Out-of-Equilibrium and Active Soft Matter, Roscoff, France.
•06/2016 ACS Colloids, Cambridge, MA.
•06/2016 Active and Smart Matter: A New Frontier for Science and Engineering, Syracuse.
•03/2016 American Physical Society, March Meeting, Baltimore.
•11/2015 AIChE Annual Meeting, Salt Lake City.

**Prior to UNC-CH**

•11/2014 AIChE Annual Meeting, Atlanta.
•09/2014 Physics Seminar, Laboratoire Charles Coulomb, Universite de Montpellier 2.
•03/2014 APS March Meeting, Denver.
•12/2013 MRS Fall Meeting, Boston.
•05/2013 Theory Seminar, University of Nottingham.
•03/2013 APS March Meeting, Baltimore.
•10/2012 Complex System Academic Advanced Workshops (CSAAW) seminar, Michigan.
•03/2012 APS March Meeting, Boston.
•07/2011 Boulder School for Condensed Matter Physics.
•05/2011 Mini Conference on Statistical Mechanics of Glassy and Disordered Systems, King's College London.
•11/2009 Physical chemistry group, Institut Curie, Paris.
•09/2008 Condensed Matter Theory Group, The Rudolf Peierls Centre for Theoretical Physics, University of Oxford.

**Klotsa group oral presentations**

• 2023/03/05-10 Jin Lee, D. Klotsa "Activity-Enhanced Colloidal Materials Assembly", Focus session *Active Matter*, American Physical Society March Meeting, Las Vegas.

• 03/2022 N. Lauersdorf, M. Moradi, E. Nazockdast, D. Klotsa. "Surface tension of soft active Brownian particles", American Physical Society March Meeting, Chicago.

• 03/2021 T. Dombrowski, D. Klotsa. "Pairwise and Collective Interactions of a Model Swimmer at Intermediate Reynolds Numbers", American Physical Society March Meeting, Denver.

• 03/2021 H. Nguyen, T. Dombrowski, D. Klotsa. "Effect of inertia on the collective dynamics of an active suspension of mesoscale model swimmers", American Physical Society March Meeting, Denver.

• 03/2020 T. Dombrowski, D. Klotsa. "Pairwise and Collective Interactions of a Model Swimmer at Intermediate Reynolds Numbers", American Physical Society March Meeting, Denver.

• 03/2020 I. Seim, A. Gladfelter, D. Klotsa. "The role of a hidden ordered domain in controlling the material properties of RNA-protein condensates", American Physical Society March Meeting, Denver.

• 03/2019 T. Dombrowski, D. Klotsa. "From Single to Many: Swimming at Intermediate Reynolds Numbers". American Physical Society, March Meeting, Boston.

• 03/2019 T. Kolb, D. Klotsa "Binary Mixtures of Hard Sphere Active Brownian Particles", American Physical Society, March Meeting, Boston.

• 03/2019 I. Seim, A. Gladfelter, D. Klotsa. "Molecular dynamics simulations of liquid-liquid phase separation in biology", American Physical Society, March Meeting, Boston.

• 11/2018 T. Dombrowski, D. Klotsa. "Transition in Motility and Collective Behavior of a Simple, Self-Propelled Swimmer at Intermediate Reynolds Numbers", American Physical Society, Division of Fluid Dynamics Annual Meeting, Atlanta.

• 03/2018 T. Dombrowski, D. Klotsa. "Collective Behavior of Swimmers in Fluids at Intermediate Reynolds Numbers", American Physical Society, March Meeting, L.A.

• 03/2018 T. Kolb, D. Klotsa. "Phase Separation in Binary Mixtures of Active Brownian Particles", American Physical Society, March Meeting, L.A.

• 11/2017 T. Kolb, D. Klotsa. "Heterogeneous Active Matter Systems" American Institute of Chemical Engineers Annual Meeting, Minneapolis.

• 03/2017 T. Kolb, D. Klotsa. "Heterogeneous Active Matter" American Physical Society, March Meeting, New Orleans.

• 11/2017 S. Jones, A. Bhalla, B. Griffith, D. Klotsa. "Transitions in swimming behavior at intermediate Reynolds numbers of a reciprocal "spherobot" swimmer". American Physical Society, Division of Fluid Dynamics Annual Meeting, Denver.

• 03/2017 S. Jones, A. Bhalla, B. Griffith, D. Klotsa. "A self-propelled two-sphere swimmer" American Physical Society, March Meeting, New Orleans.

**Posters**

**From UNC-CH**

•08/2017 Soft Matter Gordon Research Conference, Colby-Sawyer, New London, NH.
•11/2016 AIChE Annual Meeting, San Francisco.

**Prior to UNC-CH**

•11/2015 American Physical Society, Division of Fluid Dynamics Annual Meeting, Boston.
•06/2014 ACS Colloids, University of Pennsylvania.
•05/2013 Gordon Research Seminar & Conference: Self-assembly and Supramolecular Chemistry, Les Diablerets, Switzerland.
•04/2013 Symposium: the Origin of Life, University of Michigan.

•10/2012 Fluidity Adaptability Rigidity workshop on Engineering physics and Architecture, University of Chicago.
•08/2011 Gordon Research Conference: Soft Matter Far from Equilibrium, New London NH.
•01/2011 Mini Stat Mech, University of California Berkeley.
•01/2011 Dynamics Days 2011, Carolina Inn, Chapel Hill.
•07/2010 CECAM Crystallization: from colloids to pharmaceuticals, Lausanne.
•05/2010 Particulate matter: does dimensionality matter? Max Planck Institute, Dresden.
•03/2010 APS March Meeting, Portland.
•02/2008 Pattern Formation in Particle systems, Mathematics Interdisciplinary Research and Complexity Science DTC, University of Warwick.
•07/2007 Statics and Dynamics of Granular Media and Colloidal Suspensions, Satellite Conference of Staphys 23, Napoli.
•04/2004 Condensed Matter and Materials Physics, (CMMP), University of Warwick.
•02/2004 Advances in Molecular Electronics International Workshop (ADMOL), Max Planck Institute, Dresden.

**Klotsa group posters**

• 10/2018 I. Seim, A. Gladfelter, D. Klotsa. "Modeling liquid-liquid phase separated droplets with molecular dynamics", 11th Biennial Carolina Biophysics Symposium, University of North Carolina at Chapel Hill.

• 05/2018 T. Dombrowski, D. Klotsa. "Collective Behavior of Swimmers in Fluids at Intermediate Reynolds Numbers", Triangle Soft Matter Workshop, NC State University, Raleigh.

• 05/2018 T. Kolb, D. Klotsa. "Motility-Induced Phase Separation in Active/Active Mixtures", Triangle Soft Matter Workshop, NC State University, Raleigh.

• 10/2017 T. Kolb, D. Klotsa. "Binary Active Mixtures Exhibit Dynamic Steady-State Behaviors", Triangle Student Research Competition, Research Triangle Park, NC.

• 05/2017 T. Kolb, D. Klotsa. "Tunability of Active Matter Mixtures". Triangle Soft Matter Workshop, University of North Carolina at Chapel Hill.

• 05/2016 T. Kolb, D. Klotsa "Active Matter Mixtures: Heterogeneity Breeds Utility", Triangle Soft Matter Workshop, Duke University, Durham.

**TEACHING**

•Spring 2021, Introduction to Scientific Computing for Materials (MTSC 785), Department of Applied Physical Sciences, UNC-CH (8 students).
•Fall 2020, Soft Materials (APPL 490: Special Topics in Applied Physical Sciences), Department of Applied Physical Sciences, UNC-CH (14 students).
• Spring 2020 Soft Materials (APPL 490/465: Special Topics in Applied Physical Sciences), Department of Applied Physical Sciences, UNC-CH (4 students, 3 registered).
• Fall 2019, RSA.
• Spring 2019, Semester off from accumulated credits.
• Fall 2018, General Physics I (PHYS 114), Department of Physics,UNC-CH (400 students), 1.5 teaching load.
•Maymester 2018, Dancing Science (EXSS 191.01M/290.01M), Department of Exercise and Sport Science, UNC-CH. Class canceled.
Developed material for the class.
•Spring 2018, Complex Fluids: theory and applications (MTSC891), Development of curriculum and teaching, Department of Applied Physical Sciences, UNC-CH (4 students).
•Fall 2017, Computational Physics (MTSC891: Computational physics), Development of curriculum and teaching, Department of Applied Physical Sciences, UNC-CH (5 students).

•Spring 2017, General Physics I (PHYS 114), Department of Physics,UNC-CH (400 students), 1.5 teaching load.
•Fall 2016, Soft Materials (APPL 490: Special Topics in Applied Physical Sciences), Department of Applied Physical Sciences, UNC-CH (9 students).
•Spring 2016, Soft Materials (APPL 490: Special Topics in Applied Physical Sciences), Development of curriculum and teaching, Department of Applied Physical Sciences, UNC-CH (4 students).

**GROUP** **CURRENT:**

**1. Thomas Dombrowski**:
2024 - current. Postdoctoral fellow

**2. Ravi Gautam**:
2024 - current. Postdoctoral fellow

**3. Sri Sruthi Potluru**:
Undergraduate research student, spring 2023- present.

**ALUMNI:**
**Graduate students:**

**1. Nicholas Lauersdorf (defended July 2024)**:
2019 - 2024. Graduate Student, Applied Physical Sciences
• Thesis title: Multicomponent active matter
• Awards:
  ◦ National Defense Science and Engineering Graduate (NDSEG) Fellowship, Sept.2021-2024
• Activities: oral and poster presentations
• Publication status: 2 papers published.

**2. Ian Seim**:
2017 - 2023. Graduate student, Bioinformatics and Computational Biology (BCB), co-advised with Amy Gladfelter (Biology)
• Thesis title: Controlling the material properties of RNA-protein condensates
• Awards: Molecular and Cellular Biophysics Training Grant, July 1, 2018 ? June 30, 2020
• Activities: Oral and poster presentations
• Publication status: 1 published.

**3. Thomas Dombrowski (defended April 2021)**:
2017 - 2021. Graduate Student, Physics
• Thesis title: Collective behavior of swimmers at intermediate Reynolds numbers
• Awards:
  ◦ Dissertation Completion Fellowship, UNC-CH Graduate School, Aug.2020-Apr.2021
• Activities: 4 oral, 1 poster presentations
• Publication status: 3 published.

**4. Thomas Kolb (defended July 2020)**:
2015 - 2020. Graduate student, Chemistry, Division of Physical Chemistry
• Thesis title: Statistical mechanics of active matter mixtures.
• Awards:
  ◦ National Science Foundation Graduate Research Fellowship, Sept.2017-Aug.2020
  ◦ Best Poster Award, Triangle Soft Matter Workshop (NC State University) May 2018

- Materials Research Science and Engineering Center Fellowship, Aug. 2016-Aug.2017
- First Place, CHANL Scientific Art Competition (UNC Chapel Hill), April 2016

• Activities: 4 oral, 4 poster presentations; attended "Georgetown active materials project" summer school, Georgetown
• Publication status: 2 published

**Postdocs:**

**1. Hong Nguyen**:
2020 - 2024. Postdoctoral fellow

**2. Shannon Jones**:
2016-2018 Postdoctoral fellow

**Masters:**

**1. Jin Lee**:
2019 - 2023. Graduate Student, Applied Physical Sciences
• Thesis title: Multicomponent active matter in crowd behavior

**2. Minzhi Jiang**:
2016-2018. Masters Student, Applied Physical Sciences
•Thesis title: Computational study for optimizing nanocomposite polymer materials
• In collaboration with Greg Forest, Peter Mucha, Theo Dingemans, funded by DOD-ARO grant
• Activities: Attended "Summer School on soft solids and complex fluids", UMass Amherst, "Georgetown active materials project", Georgetown

**Undergraduates and high-school students:**

**1. Taylor Smith**:
Undergraduate research student, spring 2023.

**1. Arden Feldt**:
Undergraduate research student, spring 2023.

**1. Ben Sykes**:
Undergraduate research student, spring 2023.

**2. Zakia Ishaque**:
Fall 2022 - current. Undergraduate research student.
• Project title: Analyzing demographic trends within the ?Triangle area? healthcare system.

**3. Grant Fourie**:
Fall 2022 Undergraduate research student.
• Project title: Crowd Escape Dynamics

**4. Steini Davidsson**:
Undergraduate assistant, academic year 2016-207, summer 2017, spring 2020
• Activities (current): data analysis of protein sequences
• Activities (past): Particle tracking code, machine learning. Supervised high-school students on hexbug-robot experiments.

**5. Aneesha Manocha**:
Summer 2017 High-school student
• Experiments on the collective behavior of hexbugs robots. Designed and 3D printed caps, set up platform, performed experiments, recorded and analyzed results. Wrote code for flocking model app.

**6. Adam Guskiewicz**:
Summer 2017 High-school student
• Experiments on the collective behavior of hexbugs robots. Designed and 3D printed caps, set up platform, performed experiments, recorded and analyzed results.

## PROFESSIONAL SERVICE TO DISCIPLINE

• Refereed for: *Proceedings of the National Academy of Sciences*, *Nature Physics*, *Physical Review Letters*, *Soft Matter*, *Journal of Fluid Mechanics*, *Physics of Fluids*, *Physical Review E*, *Current Opinion in Colloid and Interface Science*, *European Physics Letters*, *Physics Letters A*, *Journal of Physical Chemistry*

**From UNC-CH**
• 2024/10/15-18 Co-organizer conference *The Many Faces of Active Mechanics*, Kavli Institute of Theoretical Physics (KITP).
• 2024/10-12 Coordinator *Active Solids: From Metamaterials to Biological Tissue*, Kavli Institute of Theoretical Physics (KITP).
• Co-organizer ISMC 2024, The 8th International Soft Matter Conference, Raleigh, North Carolina.
•Secretary Treasurer Group on Statistical and Nonlinear Physics (GSNP), American Physical Society.
•Program committee March Meeting 2023, American Physical Society's Group on Statistical and Nonlinear Physics (GSNP).
•Organizer of online *klogW* seminar series of the American Physical Society's group on Statistical and Nonlinear Physics (GSNP).
• Executive committee member, elected secretary/treasurer (2022-2025), American Physical Society's group on Statistical and Nonlinear Physics (GSNP).
• Chair of membership committee (2021-2022), American Physical Society's group on Statistical and Nonlinear Physics (GSNP).
• Elected member-at-large (2019), American Physical Society's group on Statistical and Nonlinear Physics (GSNP).
•Organizer of Focus sessions *Macromolecular Phase Separation*, American Physical Society, March Meeting, Denver 2021.
• Review Editor (Editorial Board) of journal *"Soft Matter Physics"*.
•Organizer of Focus session *Macromolecular Phase Separation*, American Physical Society, March Meeting, Denver 2020.
•Organizer of Focus session *Phase Separation in Biological Processes*, American Physical Society, March Meeting, Boston 2019.
• Organizer of Focus session *From single swimmers to swarms: active matter in fluids at intermediate Reynolds numbers*, American Physical Society, Division of Fluid Dynamics Annual Meeting, November 18-20 2018, Atlanta, GA.
• Co-organizer of minisymposium *Mathematical aspects of programmable self-assembly*, SIAM conference on Materials Science, July 9-13 2018, Portland, Oregon.
• Ad-hoc reviewer, Army Research Office (ARO).
• Ad-hoc reviewer NSF, Directorate of Materials Research (DMR), Condensed Matter and Materials Theory (CMMT).
• Review (virtual) panel NSF, Directorate of Materials Research (DMR), Condensed Matter Physics (CMP).
• Review (virtual) panel NSF, Computational and Data-Enabled Science and Engineering (CDS&E).

• Co-chair and organizer of *Active Colloids* Session, AICHE 2015, 2016, 2017, 2018.
• Abstract sorter's meeting, American Physical Society, APS 2015, 2016.
• Poster judge: *Triangle student research competition* 2016; *Active and Smart Matter: A New Frontier for Science and Engineering*, 2016 Syracuse.

**Prior to UNC-CH**

• Co-chair for Gordon-Kenan Research Seminar: *Self-assembly and Supramolecular Chemistry*, Les Diablerets, Switzerland (05/2013)
• Co-organizer of Institute of Physics one-day workshop *Complexity and Nonlinear Phenomena in Biological Systems* University of Bath (05/2010)
• Committee member of *Nonlinear and Complex Physics Group*, Institute of Physics IoP.

## PROFESSIONAL SERVICE TO UNC-CH/COMMUNITY

**Student committees**

• Nicholas Battista, Applied Math (graduated). Advisor: Laura Miller
• Li Qiaoxi (Chelsea), Chemistry (graduated). Advisor: Sergei Sheiko
• Cary Aaron Tippets, Applied Physical Sciences (graduated). Advisor: Rene Lopez
• Erin Langdon, Biology (graduated). Advisor: Amy Gladfelter
• Logan Howard, BME (graduated). Advisor: Nancy Albritton
• Nicholas J. Derr, John A. Paulson School of Engineering and Applied Sciences, Harvard University (defended 04/2022). Advisor: Chirstopher Rycroft
• Christopher Moakler, Physics (graduated). Advisors: Katie Newhall
• Samuel Heroy, Applied Math. (graduated). Advisors: Peter Mucha and Greg Forest
• Kemal Ozalp, Biology. (graduated) Advisor: Laura Miller
• Katherine Daftari, Applied Mathematics. (graduated). Advisors: Katie Newhall
• Jiali Zhu, Bioinformatics and Computational Biology. Advisors: Paul Maddox and Ehssan Nazockdast
• Wenzheng Shi, Applied Physical Sciences. Advisors: Ehssan Nazockdast
• Mahsa Mofidi, Applied Physical Sciences. Advisors: Ehssan Nazockdast
• Elizabeth Mae Davis, Bioinformatics and Computational Biology. Advisors: Timothy Elston
• Kathy Guan, Bioinformatics and Computational Biology. Advisors: Timothy Elston
• Tom Edward Carney, Chemistry. Advisors: Yosuke Kanai

**Department committees**

• Colloquium organizer 2015-current.
• Talent search committee 2020-current.
• Faculty search committee 2016-2017, 2017-2018, 2023-2024.
• Diversity committee 2016-2017, 2017-2018.
• Student recruitment committee 2015-2016, 2016-2017, 2017-2018.
• Communications committee 2017-2018.

## PROFESSIONAL TRAINING

• 12/06/2019 Mental Health Training Part I.
• 08/12/2019 Safe Zone Training.
• 06/26-30/2017 *Mobile Summer Institute (MoSI)* Week-long workshop on teaching, UNC-CH.
• 07/12/2016 *Understanding Differences: A One-Day Retreat and Workshop*, UNC-CH.
• 06/5-7/2016 *NSF Condensed Matter Physics Principal Investigators Workshop*, NSF, CMMT, Arlington VA.
• 03/2016 NSF-CAREER Group, organized by Peter Mucha (APS, Applied Math), UNC-CH.
• 03/24/2016 Broader Impacts Success Series workshops, Office of Research Development.

## AWARDS/SCHOLARSHIPS PRIOR TO UNC

• Marie-Curie IOF three-year Postdoctoral Fellowship $\$272K$ (08/2012-08/2015).

• Selected to present research to a public audience at the event EURAXESS Share: Broaden Your Horizons European-Funded Research and North America, Columbia University (03/2014).
• Poster Prize and talk at Emerging Leaders Session: Gordon Research Conference, Self-assembly and Supramolecular Chemistry, Les Diablerets, Switzerland (05/2013).
• Raised $\$1,380.00$ (DOE) and $\$2,210.00$ (NIH) as co-chair for Gordon Research Seminar, Les Diablerets, Switzerland (05/2013).
• Boulder School for Condensed Matter Physics 1-month scholarship (07/2011).
• Alexander S. Onassis Public Benefit Foundation four-year PhD Scholarship (2004). (declined).
• University of Nottingham PhD funding (2005-2009).

## OUTREACH

• 2025/03/01 Invited panel speaker Undergraduate open day, UNC Chapel Hill. • Invited speaker, *Science is Awesome* event, Department of Physics, UNC-Chapel Hill. Won best presentation *The physics of penguin huddling* (summer 2018).
• Invited speaker, *SHAPE Symposium on Horizons in Astronomy and Physics Education*, Department of Physics, UNC-Chapel Hill, (spring 2018).
•03/2014 Invited speaker as a Marie-Curie fellow to present research to a broad audience, *EURAXESS Share: Broaden Your Horizons European-Funded Research and North America.* Columbia University. Video
•06/2013 Invited speaker as a Marie-Curie fellow. *EURAXESS Share: Research Job and funding Opportunities in Europe for All*, Creighton University, Omaha, NE.