

DAPHNE KLOTSA *Curriculum Vitae*

Mailing Address

205 S. Columbia St.
 CB 3216 UNC Chapel Hill
 Chapel Hill NC 27599-3216, USA

Contact Information

Phone: (001) 919-962-6454
 Email: dklotsa@email.unc.edu
 Web: <http://klotsagroup.wixsite.com/home>

Faculty Positions UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL 08/2015 – Present
Assistant Professor
 Department of Applied Physical Sciences

Postdoctoral Positions

UNIVERSITY OF CAMBRIDGE, U.K. 08/2014 – 07/2015
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

Grants funded

- Co-PI. 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; Total award period covered: 6/10/2016-12/9/2017

Publications 15. Density landscapes and crystal transitions for self-assembly of continuous families of shapes. D. Klotsa*, E. R. Chen*, M. Engel and S. C. Glotzer, (*preprint*–in preparation for submission to *Phys. Rev. Lett.*).

*co-first authors

14. Clusters of polyhedra in spherical confinement.
E. G. Teich, G. van Anders, D. Klotsa, Julia Dshemuchadse and S. C. Glotzer. *PNAS* **25**, E669 (2016). Featured in phys.org (<http://phys.org/news/2016-02-particles-confined-space.html>)
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 and Sciences Website (<http://college.unc.edu/2016/03/22/klotsa/>).
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), 95429553 (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).

**Invited
Talks and
Seminars**

04/2017 Invited Speaker, 14th Ann. Conference on Foundations of Nanoscience: Self-Assembled Architectures and Devices (**FNANO17**), Snowbird, Utah.
 04/2017 Invited Seminar, Physical Applied Math, **MIT**.
 012/2016 Invited Seminar, Soft Matter Group, Physics, **NYU**.
 012/2016 Invited Seminar, Chemical Engineering, **Columbia**, NY.
 012/2016 Invited Seminar, **Simon's Foundation**, NY.
 012/2016 Invited Seminar, Physics, **University of Virginia**.
 07/2016 Invited Speaker **Granular Matter Gordon Research Conference**, Stonehill College, Easton, MA.
 05/2016 Invited Speaker Triangle Soft Matter Workshop 2016, **Duke University**.
 01/2016 Invited Speaker, Dynamics Days 2016, Durham, NC.
 06/2015 Invited seminar, School of Mathematical Sciences, **Queen Mary**.
 04/2015 Invited seminar, Physics Department, **University of Bath**.
 04/2015 Invited seminar, Chemical & Biomolecular Engineering, **Johns Hopkins**.
 03/2015 Invited seminar, Physics Department, **UNC-Chapel Hill**.
 03/2015 Invited seminar, Physics Department, **Duke University**.
 03/2015 Invited seminar, Physics Department, **Johns Hopkins**.
 03/2015 Invited seminar, Chemical and Petroleum Engineering, **University of Pittsburgh**.
 03/2015 Invited seminar, Chemical and Biological Engineering, **Northwestern**.
 03/2015 Invited seminar, Chemical Engineering, **University of Oklahoma**.
 02/2015 Unifying Concepts in Glass Physics VI, **Aspen Center for Physics**, Aspen, CO.
 10/2014 Lunch Seminar Series, Chemistry Department, **University of Cambridge**.
 07/2014 Invited seminar, Chemical Engineering Department, **North Carolina State**.
 06/2014 Squishy Physics Seminar, Physics Department, **Harvard**.
 04/2014 Invited seminar, Chemical Engineering Department, **University of Texas at Austin**.
 02/2014 Invited speaker **27th annual Workshop on Recent Developments in Computer Simulation Studies in Condensed Matter Physics**, University of Georgia.
 05/2013 **Emerging Leaders Session: Gordon Research Conference**, Self-assembly and Supramolecular Chemistry, Les Diablerets, Switzerland.
 10/2012 Physics Colloquium, **Wesleyan University**.
 03/2012 WAM Seminar, School of Engineering and Applied Sciences, **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**.
 02/2005 TransDNA, Transport in and Computing with DNA, MIR@W-DAY, Centre for Scientific Computing, **University of Warwick**.

**Contributed
Talks and
Seminars**

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.
 11/2015 AIChE Annual Meeting, Salt Lake City.
 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.

Posters & Selected attended meetings

08/2017 **Soft Matter Gordon Research Conference**, Colby-Sawyer, New London, NH.
 11/2015 DFD 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.

Teaching & mentoring experience

- Spring semester UNC-CH, Soft Materials (APPL 490: Special Topics in Applied Physical Sciences)
- 2014-2015 Math teaching assistant for first year undergraduates (St. John's College) in the Natural Sciences Tripos, University of Cambridge.
- 2011-present Supervising undergraduate and graduate students in the Glotzer group, University of Michigan: Erin Teich (PhD Applied Physics), Xiyu Du (PhD Applied Physics), Matthew Spellings (PhD Chemical Engineering), Nguyen H. P. Nguyen (PhD Mechanical Engineering 2014), Daniel Ortiz (PhD Materials Science and Engineering 2014), Jared Snyder (MSc Applied Physics 2013), Chiedozie Okorie (UROP program).
- 2013 Postdoctoral Short-Course on College Teaching in Science and Engineering (PSC), CRLT, University of Michigan.
- 2005-2007 Teaching C-programming to undergraduates (all years). School of Physics and Astronomy, University of Nottingham, U.K.
- 2003-2004 Demonstrator in Physics lab to 1st year undergraduates and marking of lab books. Physics Department, University of Warwick, U.K.

Outreach

- 03/2014 Invited speaker as a Marie-Curie fellow to present research to a broad audience for the event: EURAXESS Share: Broaden Your Horizons European-Funded Research and North America. Columbia University. Video: https://www.youtube.com/watch?v=6xy-5K8UV94&list=PL0f9_Zk0qwjlBwB3kGTuSnx-VuPM112xw&index=3
- 06/2013 Invited speaker as a Marie-Curie fellow. EURAXESS Share: Research Job and funding Opportunities in Europe for All, Creighton University, Omaha, NE.

Awards, Scholarships

- 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).
- Marie-Curie IOF three-year Postdoctoral Fellowship (08/2012-08/2015).
- 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).

**Other
Scientific
Activity**

- Co-organizer of *Active Colloids* Session, AICHE 2015, 2016, 2017
- 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, and editor of the newsletter.
- Organizer of weekly theory group meetings, Physics Department, University of Bath.
- Refereed for *Physical Review Letters*, *Soft Matter*, *Physics of Fluids*, *Current Opinion in Colloid and Interface Science*, *European Physics Letters*, *Physics Letters A*, *Journal of Physical Chemistry*

**Computational
Skills**

- Programming: C, C++, Python, OpenGL, FORTRAN, Mathematica, HOOMD-blue.
- System co-administrator for High Performance Computing interface (callisto) in School of Physics and Astronomy, University of Nottingham (2005-2006).