CARMEN LEE

Curriculum Vitae
June 18, 2024

NSERC Postdoctoral Fellow
Department of Physics
North Carolina State University
249 Riddick Hall, 2401 Stinson Drive
Raleigh, NC, 27607

Phone: +1 (919)-232-1857

Email: cllee3@ncsu.edu

EDUCATION

2022 Ph.D. in Physics
McMaster University
Thesis title: Driven flow of droplets and bubbles
Supervisor: Dr. Kari Dalnoki-Veress

2018 M.Sc. in Physics
McMaster University
Thesis title: Capillary levelling of bilayer thin films
Supervisor: Dr. Kari Dalnoki-Veress

2016 B.Sc. Honours in Physics
Dalhousie University
Minor in Earth Sciences, certificates in Materials Science and Informational Technology
Dalhousie Integrated Science Programme
Research advisors: Dr. Ian Hill (2012, 2014–2016), Dr. James Drummond (2013)

ACADEMIC APPOINTMENTS

12/2022 – present	**Postdoctoral Research Fellow** Department of Physics, North Carolina State University
08/2023 – present	**Instructor, Physics 208: Physics for Engineers and Scientists II** Department of Physics, North Carolina State University
09/2022 – 12/2022	**Postdoctoral Researcher** Department of Physics & Astronomy, McMaster University
09/2016 – 08/2022	**Graduate Research Assistant** Department of Physics & Astronomy, McMaster University
04/2013 – 08/2016	**Undergraduate Research Assistant** Department of Physics & Atmospheric Science, Dalhousie University

PUBLICATIONS

List of Peer-Reviewed Publications

* indicates co-first authorship

1. *Capillary levelling of immiscible bilayer films*. V. Bertin*, C. Lee*, T. Salez, E. Raphaël, K. Dalnoki-Veress. J. Fluid Mech. 911 A13 (2021).
2. **[Cover]** *Droplet migration on conical fibers*. C. Fournier, C. Lee, R. Schulman, E. Raphaël, K. Dalnoki-Veress. Eur. Phys. J. E 45 12 (2021).
3. *Film coating by directional droplet spreading on fibers*. T.S. Chan*, C. Lee*, C. Pedersen, K. Dalnoki-Veress, A. Carlson. Phys. Rev. Fluids 6, 014004 (2021).
4. *Noise resistant synchronization and collective rhythm switching in a model of animal group locomotion*. G. N. Doering, B. Drawert, C. Lee, J. N. Pruitt, L. R. Petzold, K. Dalnoki-Veress. Royal Society Open Science, 9 3, 211908 (2022).
5. **[Back cover]** *Multiple droplets on a conical fiber: formation, motion, and droplet mergers*, C. Lee*, T.S. Chan*, A. Carlson, K. Dalnoki-Veress, Soft Matter, 18, 1364 1370 (2022).
6. *Synchronized locomotion can improve spatial accessibility inside ant colonies*. G.N. Doering, C. Lee, K. Dalnoki-Veress. *Proc. R. Soc. B.* **290:**20231805 (2023).
7. *Buckling instabilities of moving chains of bubbles*. C. Lee and K. Dalnoki-Veress *Phys.Rev. Research*. **6,** L022062 (2024).

Submitted Manuscripts

1. *Particle scale anisotropy controls bulk properties in sheared granular materials.* C. Lee, E. Bililign, E. Azéma, K. Daniels. (2024) https://arxiv.org/abs/2405.00653.

Non-peer reviewed publications

1. *Summary of the 52nd Annual Canadian Undergraduate Physics Conference*. C. Lee, Physics in Canada Volume 73 No. 4 (2017).
2. *Equity Diversity and Inclusion: A Graduate Student Perspective*. S. Dawson, C. Lee, W. Kirkby, J. Wightman, R. Pillsworth, Physics in Canada Volume 77 No. 1 (2021).

HONOURS AND AWARDS

2023 **Emerging Soft Matter Excellence Award,** which recognizes an exceptional graduate student pursuing research in soft matter physics.
American Physical Society - Division of Soft Matter, United States.

2023 **Rising Stars in Biological and Soft Matter Symposium –** selected to take part in the Rising Stars in Soft and Biological Matter Symposium 2022, University of Chicago. “a platform for exceptional early-career scientists in the broad field of soft and biological matter”
University of Chicago and University of California Santa Diego.

2023 **Science Champion** – selected as science outreach leader at McMaster University
McMaster University

2022 **Natural Sciences and Engineering Research Council Postdoctoral Fellowship**
Natural Sciences and Engineering Research Council (NSERC)

2021 **Ontario Graduate Scholarship**
McMaster University & Province of Ontario Hamilton, ON, Canada

2018 **Vanier Graduate Scholarship**
Natural Sciences and Engineering Research Council (NSERC)

2017 **Ontario Graduate Scholarship**
McMaster University and the Province of Ontario, Hamilton, ON, Canada

2016 **Canadian Graduate Scholarship – Masters**
Natural Sciences and Engineering Research Council (NSERC)

2016 **Graduate Entrance Scholarship**
McMaster University, Hamilton, ON, Canada

2016 **Johnston Award**
Dalhousie University Halifax, NS, Canada

2013-2016 Dean's List
Dalhousie University Halifax, NS, Canada

2016 **Undergraduate Student Research Award**
Natural Sciences and Engineering Research Council (NSERC)

2015 **Undergraduate Student Research Award**
Natural Sciences and Engineering Research Council (NSERC)

2015 **Summer Research Award**
Dalhousie Research in Energy, Advanced Materials and Sustainability (DREAMS)
Halifax, NS, Canada

2014 **NSERC CREATE Training Program in Arctic Atmospheric Science**
Natural Sciences and Engineering Research Council of Canada (NSERC)

2012 **Michael J Keen Memorial Award**
Dalhousie University Halifax, NS, Canada

2012 **J. G. MacGregor Award**
Dalhousie University Halifax, NS, Canada

2012 **Renewable Entrance Scholarship**
Dalhousie University Halifax, NS, Canada

PRESENTATIONS

Invited talks

2024 *Particle scale anisotropy controls bulk strength in sheared granular materials* Gordon Research Seminar. Stonehill College, Easton MA, USA.

2024 *Relating the microscale to the macroscale in granular matter* Soft, Living, Adaptive and Active Matter Symposium. UC Merced [virtual].

2023 *Relating the microscale to the macroscale in granular matter***.** Condensed Matter and Biophysics Seminars North Carolina State University, Raleigh, NC, USA**.**

2023 *Relating microscale force and fabric anisotropy to macroscale loading in granular materials: an experimental proof of the "Stress-Force-Fabric" relationship*. Indian Institute of Science, Bangalore, India. [virtual].

2022 *Driven flow of drops and bubbles***.** Dalhousie University, Halifax, NS, Canada.

2019 *Capillary driven flow***.** Max Planck Institute for Dynamics and Self-Organization, Göttingen, Germany.

2017 *Experiences of Women in Physics panel***.** Canadian Conference for Undergraduate Women in Physics. McMaster University. Hamilton, ON, Canada.

Conference presentations

2024 *Relating microscale force and fabric anisotropy to macroscale loading in granular materials: an experimental proof of the "Stress-Force-Fabric" relationship.* American Physical Society – March Meeting. Minneapolis, USA.

2023 *Rigidity Percolation in Sheared Granular Material* [Poster]. Getting into Shape – Pushing for Exotic Particulate Media Mechanics.
Lorentz Center, Leiden NL.

2023 *Rigidity Percolation in Sheared Granular Material* [Poster]. Triangle Soft Matter Day UNC-Chapel Hill, USA.

2023 *Buckling instabilities in moving chains of bubbles.* American Physical Society – March Meeting. Las Vegas, USA.

2022 **[Second place in division]** Buckling instabilities in moving chains of droplets
Canadian Association of Physicists Annual Congress.
Hamilton, ON, Canada.

2022 Coiling and buckling instabilities in moving chains of droplets impacting an interface
American Physical Society - March Meeting.
Chicago, IL, USA.

2021 A Granular analog to the Collapse of Liquid threads.
American Physical Society – March Meeting. Virtual.

2020 **[First place in student competition]** The Cheerios Effect below a Thin Elastic Film
Soft Matter Canada. Virtual.

2020 The Cheerios Effect below a Thin Elastic Film.
American Physical Society – March Meeting. Virtual.

2019 Migration of droplets on a conical fiber [Poster]
Lindau Nobel Laureate Meetings
Lindau, Germany.

2019 Migration of droplets on a conical fiber.
American Physical Society - March Meeting
Boston, MA, USA.

2018 **[Second place in student competition]** Capillary leveling of thin polymer films on a fluid substrate.
Canadian Association of Physicists Annual Congress.
Halifax, NS, Canada.

2018 **[First place in student competition]** Capillary leveling of thin polymer films on a fluid substrate [Poster].
Soft Matter Canada.
Halifax, NS, Canada.

2018 Capillary leveling of thin polymer films on a fluid substrate.
American Physical Society-March Meeting.
Los Angeles, CA, USA.

2017 **[First place]** Capillary levelling of a stepped polymer film on an immiscible liquid substrate.
Department of Physics and Astronomy Symposium Day. McMaster University.
Hamilton, ON, Canada.

2016 Optimizing Isoindigo Small-Molecule Acceptors in Organic Solar Cells.
Canadian Conference for Undergraduate Women in Physics.
Dalhousie University. Halifax, NS, Canada.

2015 **[First place]** Optimizing Isoindigo Small-Molecule Acceptors in Organic Solar Cells.
Canadian Undergraduate Physics Conference.
Trent University.
Peterborough, ON, Canada.

2015 Analyzing Tropospheric Carbon Monoxide over North America and Urban Centers Using MOPITT data.
Atlantic Universities Physics and Astronomy Conference.
Mount Allison University. Sackville, NB, Canada.

2015 Analyzing Tropospheric Carbon Monoxide over North America and Urban Centers Using MOPITT data.
Canadian Undergraduate Physics Conference.
Queen's University. Kingston, ON, Canada.

TEACHING AND MENTORSHIP

Teaching

2023 **Instructor on record – Physics 208: Physics for Engineers and Scientists II**
North Carolina State University. Raleigh, NC, United States

2019 – 2021 **Head Teaching Assistant – Astronomy/Origins 2B03: The Big Questions**
McMaster University, Hamilton ON, Canada.

2016 – 2022 **Graduate Student Teaching Assistant**
McMaster University Hamilton, ON, Canada
PHYS 1A03: Introductory Physics
PHYS 1D03: Mechanics
PHYS 1E03: Waves, Electricity and Magnetic Fields
PHYS 2H04: Thermodynamics
Astronomy/Origins 2B03: The Big Questions
PHYS 2P03: Introductory Laboratory
PHYS 3P03: Advanced Laboratory
PHYS 4S03/6S03: Molecular Biophysics.

2015 – 2016 **Undergraduate Teaching Assistant**
Dalhousie University Halifax, NS, Canada
PHYC 1300: Physics in and around you
PHYC 1290: Introduction to Physics.

Mentorship

Undergraduate student research co-supervision and mentorship

2023 Charlie Mundorf – Quantifying particle friction on the individual scale, North Carolina State University.
2023 Caitlyn Obrero – Transport properties in disordered metal networks, North Carolina State University
2022 Julia Azzi – Boundary effects on stacked polymer thin films, McMaster University
2021 Angela Moskal – Boundary effects on stacked polymer thin films**,** McMaster University
2021 Darren Tran – Interfacial coarsening of a bubble raft, McMaster University
2020 Julia Azzi – Viscous coiling instability on a rotating substrate, McMaster University
2019 Abigail Buller – The collective motion of ants and the cheerios effect under a thin elastic, McMaster University
2019 Katerina Mioc – Hanging pendant drops on thin flexible fibers, McMaster University
2018 Lauren Dutcher – Controlling wrinkling patterns in thin films, McMaster University

Mentorship programs

2018 – 2022 Graduate mentorship organizer, Physics and Astronomy Department, McMaster University
2018 – 2022 Graduate student mentor to undergraduate students. Physics and Astronomy Department, McMaster University

EQUITY, DIVERSITY, AND INCLUSION WORK AND OUTREACH

2023 – DEI committee member. North Carolina State University. Raleigh, NC, USA.
2023 – Women in Physics member. North Carolina State University. Raleigh, NC, USA.
2018 – 2022 Promoting Inclusion in Physics and Astronomy president. McMaster University

2020 – 2022 Elevate: A Day for Inclusion in Science. Lead Organizer
2018 – 2021 Graduate Student Representative in Physics and Astronomy Department Hamilton, ON, Canada.
2020 – 2021 McMaster Alumni Outreach presenter. McMaster University, Hamilton, ON, Canada.
2018 – 2020 Science on Tap Hamilton. Organizer and presenter. Hamilton, ON, Canada.
2018 Soapbox Science Toronto. Scientist speaker. Toronto, ON, Canada.
2015 – 2016 Canadian Undergraduate Physics Conference. Vice President of Sponsorship. Dalhousie University. Halifax, NS, Canada.
2015 – 2016 Canadian Conference for Undergraduate Women in Physics. Vice President of Events. Dalhousie University. Halifax, NS, Canada.
2014 – 2016 Physics Fun and Discovery Days. Demonstrator. Halifax, NS, Canada.

MEMBERSHIPS AND SERVICE

Professional Memberships

American Physical Society (2018 –)
Canadian Association of Physicists (2018 – 2022)

Referee Experience

Journal of Fluid Mechanics
Soft Matter

REFERENCES

Kari Dalnoki-Veress, Professor
Faculty of Science Research Chair in Experimental Soft Condensed Matter Physics
Dept. of Physics & Astronomy, McMaster University,
1280 Main St. W, Hamilton, ON, Canada, L8S 4M1
Tel. 905-525-9140 x22658
Email: dalnoki@mcmaster.ca

Karen E. Daniels, Distinguished Professor of Physics
Dept. of Physics
North Carolina State University
258C Riddick Hall
Raleigh, NC 27606
Tel. 1-919-513-7921
email: kdaniel@ncsu.edu

James Forrest, Professor
Dept. of Physics and Astronomy
University of Waterloo
200 University Avenue West, Waterloo, Ontario, Canada N2L 3G1

Tel. 519-888-4567 x42161
Email: jforrest@uwaterloo.ca