Tyler N. Shendruk

Contact Information

Institute for Condensed Matter & Complex Systems
School of Physics & Astronomy
University of Edinburgh
James Clerk Maxwell Building
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Research Interests

active matter — microbe motility
biophysics — cyclosis
polymer dynamics — soft condensed matter

Employment

(1) Reader in Computational Condensed Matter Physics — 2020 to present
University of Edinburgh, Edinburgh UK

(2) Senior Lecturer in Mathematical Sciences — 2020
Loughborough University, Loughborough UK

(3) Lecturer in Mathematical Sciences — 2018 to 2020
Loughborough University, Loughborough UK
- Interdisciplinary Centre for Mathematical Modeling faculty

(4) Independent Fellow — 2016 to 2018
Rockefeller University, New York NY
- Center for Studies in Physics and Biology fellow

(5) Postdoctoral Researcher hosted by Julia Yeomans — 2014 to 2016
University of Oxford, Oxford UK
- EMBO-Long Term Fellow Rudolf Peierls Centre — 2014 to 2016
- Research Associate, **Wadham College** — 2015 to 2016
- Non-stipendiary Junior Research Fellow, **St. Hilda's College** — 2015 to 2016

Education

(1) Doctorate in Philosophy Physics with Gary W. Slater — 2014
University of Ottawa, Ottawa Canada
- Thesis: Theoretical and Computational Studies of Hydrodynamics-based Separation of Particles and Polymers in Microfluidic Channels

(2) Bachelor of Science, with honours — 2007
University of Manitoba, Winnipeg Canada

Research Funding

(1) NERC Discipline Hopping for Discovery Science — 2023

(2) ERC Starting Grant (Agreement No. 851196) — 2019

(3) Center for Studies in Physics and Biology Rockefeller Fellows' Seed Fund — 2016

(4) European Molecular Biology Organization Long-Term Fellowship — 2013

(5) National Science and Engineering Research Council (NSERC)
- Postdoctorial Fellowship (PDF) — 2016
  Incompatible with Rockefeller Fellowship - declined
- Summer Program in Taiwan — 2011
- Alexander Graham Bell Canada Graduate Scholarship (CGS-D) — 2009
- Canada Graduate Scholarship (CGS-M) — 2008

Select Awards

(1) 66th Lindau Nobel Laureate Meeting
- Selected participant and young scientist 2016

(2) British Science Association Media Fellowship at the Financial Times 2014

(3) University of Ottawa
- Pierre Laberge Prize, best doctoral thesis in the Sciences 2014
- Dean's Scholarship 2014
- National Excellence Scholarship, Ph.D. Program 2009
- National Excellence Scholarship, Masters Program 2008

(4) HPCVL/Sun Microsystems Scholarship in the Computational Sciences & Engineering 2009

(5) OSAP Ontario Graduate Scholarship 2009
Incompatible with CGS - declined

Publications

(1) *Active Darcy's law*, R. Keogh, T. Kozhukhov, K. Thijssen & **T.N. Shendruk**, Physical Review Letters, *132* (18), 188301 (2024).

(2) *Spontaneous self-constraint in active nematic flows*, L.C. Head, C. Doré, R. Keogh, L. Bonn, G. Negro, D. Marenduzzo, A. Doostmohammadi, K. Thijssen, T. Lopez-Leon & **T.N. Shendruk**, Nature Physics, *20*, 492-500 (2024).
- Highlighted by as a *Student Spotlight* by the APS-DFD Social Media Committee

(3) Research Briefing: *Defects show self-constraint in active nematics*, **T.N. Shendruk**, Nature Physics, *20*, 360-361 (2024).

(4) *Active nematics in corrugated channels*, J.P. Vaidya, **T.N. Shendruk** & S.P. Thampi, Soft Matter, *XX* (XX), XX-XX (2024).

(5)
- Soft Matter Emerging Investigator Series

(6) *Entangled nematic disclinations using multi-particle collision dynamics*, L.C. Head, D. Marenduzzo, & **T.N. Shendruk**, Soft Matter, *20* (36), 7157-7173 (2024).
- Focus Collection, Colloidal interactions, dynamics and rheology

(7) *Mitigating density fluctuations in particle- based active nematic simulations*, T. Kozhukhov, B. Loewe & **T.N. Shendruk**, Communications Physics, *7*, 251 (2024) (2024).
- Focus Collection, Interactive Active Matter: Crosstalk and interfaces between distinct active systems

(8) *Lock-key microfluidics: Simulating nematic colloid advection along wavy-walled channels*, K. Wamsler, L.C. Head & **T.N. Shendruk**, Soft Matter, *20* (19), 3954-3970 (2024).

(9) *The type IV pilus chemoreceptor PilJ controls chemotaxis of one bacterial species towards another*, K.D. Yarrington, **T.N. Shendruk** & D.H. Limoli, PLOS Biology, *22* (2), e3002488 (2024).

(10) *Anisotropic run-and-tumble-turn dynamics*, B. Loewe, T. Kozhukhov & **T.N. Shendruk**, Soft Matter, *20* (5), 1133-1150 (2024).
- Soft Matter Emerging Investigator Series

(11) *Complex-tensor theory of simple smectics*, J. Paget, M.G. Mazza, A.J. Archer & **T.N. Shendruk**, Nature Communications, *14*, 1048 (2023).

- Editors' highlight in *Applied Physics and Mathematics*

(12) Editorial: *Active and Intelligent Living Matter: from Fundamentals to Applications*, A. Doostmohammadi, M.G. Mazza, **T.N. Shendruk** & H. Stark, Frontiers in Physics, *11* (2023).

(13) *Fluctuation-induced dynamics of nematic topological defects*, L. Bonn, A. Ardaševa, R. Mueller, **T.N. Shendruk** & A. Doostmohammadi, Physical Review E, *106* (4), 044706 (2022).

(14) *Mesoscopic simulations of active nematics*, T. Kozhukhov & **T.N. Shendruk**, Science Advances, *8* (34), eabo5788 (2022).

(15) *Smectic layering: Landau theory for a complex-tensor order parameter*, J. Paget, U. Alberti, M.G. Mazza, A.J. Archer & **T.N. Shendruk**, Journal of Physics A: Mathematical and Theoretical, *55*, 354001 (2022).

- Emerging Talents Focus Collection 2021

(16) *Helical flow states in active nematics*, R.R. Keogh, S. Chandragiri, B, Loewe, T. Ala-Nissila, S.P. Thampi & **T.N. Shendruk**, Physical Review E, *106*, L012602 (2022).

(17) *Passive Janus particles are self-propelled in active nematics*, B. Loewe & **T.N. Shendruk**, New Journal of Physics, *24*, 012001 (2022).

- Fast-track communication

(18) *Submersed micropatterned structures control active nematic flow, topology, and concentration*, K. Thijssen, D.A. Khaladj, S.A. Aghvami, M.A. Gharbi, S. Fraden, J.M. Yeomans, L.S. Hirst & **T.N. Shendruk**, PNAS, *118* (38), e2106038118 (2021).

(19) *Driven topological transitions in active nematic films*, D.P. Rivas, **T.N. Shendruk**, R.R. Henry, D.H. Reich & R.L. Leheny, Soft Matter, *16* (40), 9331-9338 (2020).

(20) *Collective dynamics of model pili-based twitcher-mode bacilliforms*, A.M. Nagel, M. Greenberg, **T.N. Shendruk** & H.W. de Haan, Scientific Reports, *10*, 10747 (2020).

(21) *Twist-induced crossover from two-dimensional to three-dimensional turbulence in active nematics*, **T.N. Shendruk**[*], K. Thijssen[*], J.M. Yeomans & A. Doostmohammadi, Physical Review E, *98* (1), 010601R (2018).

- Rapid communication

(22) *Enhanced gel formation in binary mixtures of nanocolloids with short-range attraction*, J.L. Harden, H. Guo, M. Bertrand, **T.N. Shendruk**, S. Ramakrishnan & R.L. Leheny, Journal of Chemical Physics, *148*, 044902 (2018).

- Cover article

(23) *Morphology of depletant-induced erythrocyte aggregates*, A. Nehring, **T.N. Shendruk** & H. de Haan, Soft Matter, *14* (40), 8160-8171 (2018).

(24) *Biopolymer dynamics driven by helical flagella*, A.K. Balin, A. Zöttl, J.M. Yeomans & **T.N. Shendruk**, Physical Review Fluids, *2*, 113102 (2017).

(25) *Rotation-induced macromolecular spooling of DNA*, **T.N. Shendruk**[*], D. Sean[*], D. Berard[*], J. Wolf, J. Dragoman, S. Battat, G.W. Slater & S.R. Leslie, Physical Review X, *7*, 031005 (2017).

(26) *Onset of meso-scale turbulence in active nematics*, A. Doostmohammadi*, **T.N. Shendruk***, K. Thijssen* & J.M. Yeomans, Nature Communications, *8*, 15326 (2017).

- Highlighted by the RU Newswire and news outlets, including Phys.org

(27) *Dancing disclinations in confined living nematics*, **T.N. Shendruk***, A. Doostmohammadi*, K. Thijssen* & J.M. Yeomans, Soft Matter, *13* (21), 3853-3862 (2017).

- Cover article and highlighted in Seek, RU research magazine

(28) *Rapid dynamics of cell-shape recovery in response to local deformations*, K. Haase, **T.N. Shendruk** & A. Pelling, Soft Matter, *13* (3) 567-577 (2017).

(29) *Hydrodynamics of microswimmers in films*, A.J.T.M. Mathijssen, A. Doostmohammadi, J.M. Yeomans & **T.N. Shendruk**, Journal of Fluid Mechanics, *806*, 35-70 (2016).

(30) *Active micromachines: Microfluidics powered by mesoscale turbulence*, S.P. Thampi, A. Doostmohammadi, **T.N. Shendruk**, R. Golestanian & J.M. Yeomans, Science Advances, *2* (7) e1501854 (2016).

- Received wide media coverage, including the Daily Mail, Wired, ScienceNews, Huffington Post, MIT Technological Review, Phys.org, and Popular Science.

(31) *Encapsulation-free controlled release: Electrostatic adsorption eliminates the need for protein encapsulation in PLGA nanoparticles*, M.M. Pakulska, I.E. Donaghue, J. Obermeyer, A. Tuladhar, C.K. McLaughlin, **T.N. Shendruk** & M.S. Shoichet, Science Advances, *2* (5) e1600519 (2016).

- Highlighted by the UofT Engineering News and covered by Forbes magazine, Nano Today, and Science Daily.

(32) *Understanding the onset of oscillatory swimming in microchannels*, J. de Graaf, A.J.T.M. Mathijssen, M. Fabritius, H. Menke, C. Holm & **T.N. Shendruk**, Soft Matter, 12, 4704-4708 (2016).

(33) *Lattice-Boltzmann hydrodynamics of anisotropic active matter*, J. de Graaf, H. Menke, A.J.T.M. Mathijssen, M. Fabritius, C. Holm & **T.N. Shendruk**, Journal of Chemical Physics, *144*, 134106 (2016).

(34) *Hotspots of boundary accumulation: Dynamics and statistics of micro-swimmers in flowing films*, A.J.T.M. Mathijssen, A. Doostmohammadi, J.M. Yeomans & **T.N. Shendruk**, Journal of the Royal Society Interface, 13, 20150936 (2016).

(35) *Upstream swimming in microbiological flows*, A.J.T.M. Mathijssen, **T.N. Shendruk**, J.M. Yeomans & A. Doostmohammadi, Physical Review Letters, *116* (2), 028104 (2016).

(36) *Adverse-mode FFF: Multi-force ideal retention theory*, **T.N. Shendruk** & G.W. Slater, Chromatography, *2* (3), 392-409 (2015).

(37) *Multi-particle collision dynamics algorithm for nematic fluids*, **T.N. Shendruk** & J.M. Yeomans, Soft Matter, *11*, 5101-5110 (2015).

(38) *Force-extension for DNA in a nanoslit: Mapping between the 3D and 2D limits*, H.W. de Haan & **T.N. Shendruk**, ACS Macro Letters, *4* (6), 632-635 (2015).

(39) *Electrophoretic mobility of polyelectrolytes within a confining well*, **T.N. Shendruk**, M. Bertrand & G.W. Slater, ACS Macro Letters, *4* (4), 472-476 (2015).

(40) *Simulating the entropic collapse of coarse-grained chromosomes*, **T.N. Shendruk**, M. Bertrand, H.W. de Haan, J. Harden & G.W. Slater, Biophysical Journal, *108* (4), 810-820 (2015).

- Cover article, *New and Notable* and collected in Nuclear Organization

(41) *Coarse-grained molecular dynamics simulations of depletion-induced interactions for soft matter systems*, **T.N. Shendruk**, M. Bertrand, J. Harden, G.W. Slater & H.W. de Haan, Journal of Chemical Physics, *141*, 244910 (2014).

(42) *Hydrodynamic chromatography and field flow fractionation in finite aspect ratio channels*, **T.N. Shendruk** & G.W. Slater, Journal of Chromatography A, *1339*, 219-223 (2014).

(43) *Field-flow fractionation and hydrodynamic chromatography on a microfluidic chip*, **T.N. Shendruk**[*], R. Tahvildari[*], N.M. Catafard, L. Andrzejewski, C. Gigault, A. Todd, L. Gagne-Dumais, G.W. Slater & M. Godin, Analytical Chemistry, *85* (12), 5981-5988 (2013).

(44) *Controlling grafted polymers inside cylindrical tubes*, T. Suo, **T.N. Shendruk**, O.A. Hickey, G.W. Slater & M. Whitmore, Macromolecules, *46* (3), 1221-1230 (2013).

(45) *Structure of polyelectrolyte brushes subject to normal electric fields*, Y.-F. Ho, **T.N. Shendruk**, G.W. Slater & P.-Y. Hsiao, Langmuir, *29* (7), 2359-2370 (2013).

(46) *Bifurcation of polyelectrolyte brushes subject to normal electric fields*, **T.N. Shendruk**, Y.-F. Ho, G.W. Slater & P.-Y. Hsiao, Physics in Canada, *69*, 3-4 (2013).

(47) *Simulations of the free-solution electrophoresis of polyelectrolytes with a finite Debye length using the Debye-Hückel approximation*, O.A. Hickey, **T.N. Shendruk**, J.L. Harden & G.W. Slater, Physical Review Letters, *109* (9) 098302 (2012).

(48) *Can slip walls improve field-flow fractionation or hydrodynamic chromatography?*, G.W. Slater & **T.N. Shendruk**, Journal of Chromatography A, *1256*, 206-212 (2012).

(49) *Electrophoresis: When hydrodynamics matter*, **T.N. Shendruk**, O.A. Hickey, G.W. Slater & J.L. Harden, Current Opinion in Colloid & Interface Science, *17* (2), 74-82 (2012).

(50) *Operational-modes of field-flow fractionation in microfluidic channels*, **T.N. Shendruk** & G.W. Slater, Journal of Chromatography A, *1233*, 100-108 (2012).

(51) *Modeling the separation of macromolecules: A review of current computer simulation methods*, G.W. Slater, C. Holm, M.V. Chubynsky, H.W. de Haan, A. Dubé, K. Grass, O.A. Hickey, C. Kingsburry, D. Sean, **T.N. Shendruk** & L. Zhan, Electrophoresis, *30* (5), 792-818 (2009).

(52) *Interfacial properties and characterization of Sc/Si multilayers*, **T.N. Shendruk**, A. Moewes, E.Z. Kurmaev, P. Ochin, H. Maury, J.-M. André, K. Le Guen & P. Jonnard, Thin Solid Films, *518* (14), 3808-3812 (2010).

(53) *The effect of surface spin disorder on the magnetism of γ-Fe_2O_3 nanoparticle dispersions*, **T.N. Shendruk**, R.D. Desautels, B.W. Southern & J. van Lierop, Nanotechnology, *18* (45), 455704 (2007).

(54) *Magnetic fluctuations in $Eu_2BaZn_xNi_{1-x}O_5$ Haldane systems*, J. van Lierop, C.J. Voyer, **T.N. Shendruk**, D.H. Ryan, J.M. Cadogan & L. Cranswick, Physical Review B, *73*, 174407 (2006).

[*] joint first author

Submitted Publications

(1) *Controlling flow patterns and topology in active emulsions*, G. Negro, L.C. Head, L.N. Carenza, **T.N. Shendruk**, D. Marenduzzo, G. Gonnella & A. Tiribocchi, submitted January (2024).

(2) *Majorana quasiparticles and topological phases in 3D active nematics*, L.C. Head, G. Negro, L.N. Carenza, N. Johnson, R.R.Keogh, G. Gonnella, A. Morozova, E. Orlandini, **T.N. Shendruk**, A. Tiribocchie,& D.Marenduzzo, submitted March (2024).

(3) *Dynamics of polymers in coarse-grained nematic solvents*, Z. Valei, K. Wamsler, A. Parker, A.R. Klotz & **T.N. Shendruk**, submitted August (2024).

(4) *Multi-Particle Collision Framework for Active Polar Fluids*, O. Baziei, B. Loewe & **T.N. Shendruk**, submitted September (2024).

In preparation

(1) *Coil-stretch and coil-globular transitions of polymers in active flows*, Z. Valei, O. Baziei, B. Loewe & **T.N. Shendruk** (2024).

(2) *Polymer dynamics in active turbulence*, Z. Valei & **T.N. Shendruk** (2024).

(3) *Rhelogy of active Brownian particles*, J. Martín-Roca, K. Thijssen, **T.N. Shendruk**, A. Cacciuto & C. Valeriani (2024).

(4) *Active block co-polymers*, Z. Valei, S. Schubert, E. Senior, A. Cacciuto, C. Brackley & **T.N. Shendruk** (2024).

Select Invited Colloquia (total of 30)

(1) University of Glasgow, Applied maths seminar
- *Complex-tensor for simple smectics* Oct 2022

(2) Heinrich Heine University Düsseldorf, Physics seminar
- *Complex-tensor for simple smectics* July 2022

(3) Forschungszentrum Jülich, Theoretical Physics of Living Matter Seminar
- *Complex Tensor Theory of Simple Smectics* July 2021

(4) Utrecht University, Debye Institute for Nanomaterials Science, Nanoseminar
- *Controlling and Simulating Active Nematics* April 2021

(5) University of Warwick, Theoretical Physics Seminar
- *Building Towards Bio-Mechanical Fluidic Machines* Jan. 2020

(6) University of Bristol, Applied Mathematics Seminar
- *Fluidic Machines: A Talk in Three Parts* April 2019

(7) Harvard SEAS, Applied Mathematics/Fluid Mechanics Seminar
- *Dancing from turbulence to active machines* Feb. 2018

(8) MIT, Physical Mathematics Seminar
- *From Ceilidh dancing to meso-scale turbulence* Oct. 2016

Select Professional Service

(1) Select Conference Organization (total of 11)

a. Complex Active and Adaptive Material Systems upcoming (2025)
Gordon Research Conference

b. Physics of Biological Cells: From molecules to populations May 2024
Higgs Centre

c. Computational Advances in Active Matter December 2023
Lorentz Center

d. Motility in Microbes, Molecules and Matter Meeting Feb (2023)
Institute of Physics
Funded by IoP & Physics of Life Network

e. Complex Active and Adaptive Material Systems — Jan (2023)
Gordon Research Conference
Funded by AFOSR, NSF, DOE & ARO

f. Artificial & Intelligent Living Matter — 2022
Ettore Majorana Foundation & Centre for Scientific Culture
Funded by the Wilhelm & Else Heraeus Foundation

(2) Committees

a. Higgs Centre Management Committee — 2023 to present
b. Computational Physics Group, Institute of Physics — 2019 to present
c. Advisory Panel for EPSRC grant EP/T002794/1 — 2020 to 2022
Transcription & Nuclear Phase Transitions
d. Research Task Group, **St. Hilda's College**, Oxford — 2016
Committee for supporting research

(3) Refereeing

a. Peer Review College Member, EPSRC — 2019 to present
b. European Research Council (ERC) — 2024
c. Department of Energy Office of Science (DOE) — 2023
d. Israel Science Foundation (ISF) — 2023
e. Swiss National Science Foundation (SNSF) — 2022
f. Royal Society — 2022
g. Outstanding Reviewer for Soft Matter — 2023
h. Physical Review Letters, Nature Communication, Soft Matter, Journal of Chemical Physics, Physical Review E, and others

(4) Administration

a. *Outreach Coordinator* for Mathematical Sciences — 2019 to 2020
Loughborough University
b. *Organizer*, Physics and Biology Seminar Series — 2017
Rockefeller University

Supervision

(1) Post-doctoral researchers associates — (total of 3)

a. Benjamín Loewe — 2021 to 2024
- Currently Assist. Prof. Pontificia Universidad Católica de Chile

b. Kristian Thijssen (co-I Mogens Jensen) — 2023 to 2024
- Currently Novo Nordisk Fonden Emerging Investigator
- EU Marie Curie Fellowship

c. Rory Claydon — 2023
- Currently senior scientist in the Euclid Consortium

(2) PhD students — (total of 8)

a. Laila Saliekh (co-I Aidan Brown) — 2023 to present
b. Oleksandr Baziei — 2023 to present
- Sanctuary Scholarship

c. François de Tournemire (co-I Gavin Melaugh) — 2022 to present
d. Zahra Valei — 2021 to present
- 2024 Likhtman Prize at PAPS2024

e. Timofey Kozhukhov — 2020 to 2024
f. Louise Head — 2020 to 2024
- Thesis Title: *Topological and activity-induced constraints in nematic liquid crystals*
- Highlighted by the APS Division of Fluid Dynamics twitter account
- Currently post-doctoral researcher, Johns Hopkins University

g. Ryan Keogh 2019 to 2023
- Thesis Title: *Self-organised flow structures in confined active nematics*
- Currently process development engineer, Boston Scientific

h. Jack Paget (co-I Andrew Archer) 2019 to 2023
- Thesis Title: *Complex tensors and simple layers: A theory for smectic fluids*
- EPSRC Doctoral Training Partnership Studentship
- 2023 Sir David Wallace Price Awardee
- Currently mathematical modeller, Bast Inc Limited

(3) Masters students (total of 9)

a. Kenzie Gibson 2023-2024
- Thesis Title: *Simulating microbial behavior in space*

b. Jan Kocka 2023-2024
- Thesis Title: *Complex tensor order parameter for smectic liquid crystals in 3D*
- Currently PhD student, Queen Mary University

c. Kira Koch 2022-2023
- Thesis Title: *Swimming in oil*

d. Daniel Gordon 2022-2023
- Thesis Title: *Colony dynamics of Pseudomonas aeruginosa and Staphylococcus aureus*
- Currently PhD student, University of Strathclyde

e. Matthaios Chouzouris 2021-2022
- Thesis Title: *Effects of bacteria cell geometry on interspecies interface structure*
- Currently PhD student, University of Edinburgh

f. Karolina Wamsler 2021-2022
- Thesis Title: *Nematic colloids in microfluidic confinement*
- Currently modelling & simulation development engineer, Tetra Pak

g. Daniel Dolan 2021-2022
- Thesis Title: *Spatial effects in continuum bacterial modelling*
- Currently modelling & data consultant, Other World Computing

h. Alex Parker 2019-2020
- Thesis Title: *Modelling polymeric materials in internally ordered biofluids*
- Currently technical business analyst, QA Ltd

i. Steven Norfolk 2019-2020
- Thesis Title: *Collective dynamics of simulated swimming micro-organisms and self-ordering mono-layers under confinement*
- Currently laboratory technician, National Centre for Atmospheric Science

(4) Summer students (total of 6)

a. Eleanor Senior (Summer Student) 2023
- Physics and Astronomy Career Development Summer Scholarship

b. Djordje Mihajlovic (Summer Student) 2023
- Physics and Astronomy Career Development Summer Scholarship

c. Mark Curtis-Rose (Summer Student) 2023
- Physics and Astronomy Career Development Summer Scholarship

d. Francis McGinley (Summer Student) 2022
- EPSRC Physics of Life Bursary

e. Matthaios Chouzouris (MSc) 2021-2022
- EPSRC Undergraduate Vacation Internship

f. Steven Norfolk (MSc) 2019-2020
- EPSRC Physics of Life Student Summer Bursary

(5) Mentees (total of 3)

a. Orlaith Skelton (PhD student; PI Joost de Graaf) 2021-2024
- Currently post-doc with Albertoi Fernandez de las Nieves

b. Taylor Womack (MSc student at Utrecht; PI Tiffany Wood) 2023-2024

c. Andrew Balin (DPhil student; PI Julia Yeomans) 2015-2017
- Currently associate at Goldman Sachs, London

d. Arnold Mathijssen (DPhil student; PI Julia Yeomans) 2014-2016
- Currently Assist. Prof. University of Pennsylvania
- Sam Edwards Thesis Prize

Select Teaching

(1) Fellow of the **Higher Education Academy** Jan. 2020

(2) **School of Physics and Astronomy**, Edinburgh
- Lecturer, Advanced Statistical Physics (Year 5) 2021 to present
- Lecturer, Non-Equilibrium Statistical Mechanics (SUPA graduate course) 2020 to present
- EUSA Teaching Awards
  a. **Nominee** 2021

(3) **Mathematical Sciences**, Loughborough
- Lecturer, Mathematics for Physics 4 (3^{rd} year) 2018 to present
- School of Science Teaching Awards (Mathematics) 2019
  a. **Awardee:** Best Feedback
  b. **Nominee:** Most Engaging Lecturer, Best Module Resources, Most Helpful & Approachable Lecturer, Most Outstanding Lecturer

(4) Thesis Defense Committees

a. External Thesis Defense Member (total of 4)
- Warwick 2024
- Bristol 2023
- Oxford 2023
- ESPCI Paris - Université PSL 2022
- IIT Madras 2021-2022

b. Internal Edinburgh University (total of 2) 2022 to present

c. Internal Oxford Adjudicating Vivas (total of 3) 2014 to 2015

(5) **Wadham College**, Oxford
- Organize events to foster intellectual exchange 2015 to 2016
  W. Inspires, *W. in Objects*, and *Student-Supervisor Science Symposium*

(6) **University of Ottawa**
- Invited Lecturer 2011 to 2012
  a. Biological Physics - *Introduction to hydrodynamics* (Graduate)
  b. Statistical Mechanics - *Computational methods* (Graduate)
  c. Nanotechnology and Modern Methods in Experimental Biophysics - *Computational Methods in Biophysics* (Graduate)
  d. Physics of Continuous Media - *Microfluidics* (4^{th} year)
  e. Solid State Physics - *Semiconductor crystals* (3^{rd} year)

Select Conference Presentations (total of 50)

(1) *Active Block Copolymers*, **T.N. Shendruk**, Lorentz Center Active Polymers and Filaments (2023) - invited talk

(2) *Mesoscale simulations of active hydrodynamics*, **T.N. Shendruk**, CECAM Challenges in the Physics of Active and Biological Matter 2023 (2023) - invited talk

(3) *Mesoscopic models for active nematic fluids*, **T.N. Shendruk**, Nordita: Current and Future Themes in Soft & Biological Active Matter (2022) - invited talk.

(4) *Active smectics*, **T.N. Shendruk**, Telluride Workshop Active Matter (July 2021) - invited talk.

(5) *A guide to controlling active nematic flows*, **T.N. Shendruk**, CECAM Out-of-Equilibrium Soft Matter in Complex Media (2019) - invited talk.

(6) *Quasi-particle model of topological defects in confined active nematics*, **T.N. Shendruk**, Dynamics Days Europe (2018) - talk.

(7) *Transitioning from Active Nematic Films to Mesoscale Turbulence in 3D Channels*, **T.N. Shendruk**, COST Action Flowing Matter (2018) - talk.

Select Science Communication

(1) Annual Higgs Halloween Lecture,
- *A bloody good crime*, David Fairhurst 2024

(2) Curious RSE summer events,
- *Space junk, biomaterials, and green computers* 2022

(3) Pint of Science,
- *Liquid Crystals: The strange middle child of condensed matter physics* 2022

(4) The Conversation,
- *How we simulated a microscopic 'wind farm' — powered by bacteria* 2016

(5) Financial Times
- **18** science briefs in the daily paper and FT Weekend Magazine 2014
- *Scientist on Assignment* **15** blog posts 2014

(6) EMBOencounters
- *Journalists and scientists share a common goal* 2014

(7) Maclean's Magazine
- *Where No Man has Tweeted Before* 2013

(8) The Fulcrum (student newspaper)
- Weekly science column (**40** science briefs) 2010 to 2013

References

- References available upon request.