

John Toner

Titles and affiliations: **Professor**, Department of Physics
 Fellow of the American Physical Society
 Higgs Associate, University of Edinburgh
 Member, Institute for Fundamental Science
 Associate Member, Material Science Institute

Address: Institute for Fundamental Science
 University of Oregon
 458 Willamette Hall
 Eugene, Oregon 97403
 1 (541) 346-0979
 E-mail: jjt@uoregon.edu

Education: **B. S.** (Mathematics) **MIT** 1977
 M.A. (Physics) **Harvard** University 1979
 Ph.D. (Physics) **Harvard** University 1981 (thesis advisor, David Nelson)
 Thesis title: Defects and other topological effects on phase transitions
 in solids, liquid crystals, He^3 films, and Magnetic systems

Employment: **9/98 - present:** **Professor of Physics**, University of Oregon
 8/95 - 8/98: **Associate Professor of Physics**, University of Oregon
 6/83 - 8/95: **Research Staff Member**, IBM T. J. Watson Research Center
 8/81 - 6/83: **James Franck Fellow**, University of Chicago

Research Interests:

Biophysics; active matter; flocking; sliding phases in biophysical and quantum systems; novel phases of DNA; fluctuating biological membranes; liquid crystals disordered superconductors; glasses defect mediated phase transitions; quasiperiodic crystals; roughening; random packings; fractals; self-organized criticality; skyrmion lattices in exotic superconductors.

Professional Recognition and Awards:

2026	The Max-Planck-Institut fur Physik Komplexer Systeme (MPIPKS), Dresden, Germany, is holding a workshop in my honor: "Hydrodynamic Approaches to Active Matter: Successes and Future Challenges", in November 2026.
2022	My PRL (10/27/22), " Packed swarms on dirt: two dimensional incompressible flocks with quenched and annealed disorder ", L. Chen, C.F. Lee, A. Maitra, and J. Toner, Phys. Rev. Lett. Vol. 129, 188004 (2022), was chosen as an " Editors' Suggestion ". In addition, it was featured in Physics Magazine .
2020	Lars Onsager Prize of the American Physical Society
2019-2020	Martin Gutzwiller Fellow , Max-Planck-Institut fur Physik Komplexer Systeme

- (**MPIPKS**), Dresden, Germany.
- 2019** My paper "**Statistical mechanics of asymmetric tethered membranes: spiral and crumpled phases**, T. Banerjee, N. Sarkar, A. Basu, and J. Toner, Phys. Rev. E Vol. 99, 053004 (2019), was chosen as an **Editors' Suggestion**.
- 2018** My paper: **Flocks, herds, and schools: A quantitative theory of flocking**, Y. Tu and J. Toner, Phys. Rev. E **58**, 4828 (1998), was selected by Physical Review E as its "**Landmark paper**" for 1998.
- 2018** My paper: **Mapping two-dimensional polar active fluids to two-dimensional soap and one dimensional sandblasting**, L. Chen, C. F. Lee, and J. Toner, **Nature Communications** 10.1038/NCOMMS12215 (2016), was included in a web collection of primary research and review articles on active matter across a selection of Nature journals.
- 2015-2021** **Higgs Associate**, Higgs Centre for Theoretical Physics, University of Edinburgh
- 2014** **Distinguished Visitor Award**, Scottish Universities Physics Alliance
- 2011** **Simons Fellow in Theoretical Physics** (2012-2013)
- 2006** **Fellow of the American Physical Society**

Forthcoming Invitations 2026

25th Berkeley Statistical Mechanics and CECAM-US-WEST Kickoff Meeting,
University of California, Berkeley.

University of Wisconsin, Madison

"Hydrodynamic Approaches to Active Matter: Successes and Future Challenges",
Max-Planck-Institut für Physik Komplexer Systeme(**MPIPKS**), Dresden, Germany.

Visiting Appointments:

- 2025** **Higgs Associate**, University of Edinburgh, UK
- Max-Planck-Institut für Physik Komplexer Systeme
(**MPIPKS**), Dresden, Germany.
- 2024** **Higgs Associate**, University of Edinburgh, UK
- Max-Planck-Institut für Physik Komplexer Systeme
(**MPIPKS**), Dresden, Germany.
- 2023** **Higgs Associate**, University of Edinburgh, UK
- Max-Planck-Institut für Physik Komplexer Systeme
(**MPIPKS**), Dresden, Germany.

- 2022** **Martin Gutzwiller Fellow**, Max-Planck-Institut für Physik Komplexer Systeme (MPIPKS), Dresden, Germany.*

Higgs Associate, University of Edinburgh, UK
- 2021** **Martin Gutzwiller Fellow**, Max-Planck-Institut für Physik Komplexer Systeme (MPIPKS), Dresden, Germany.*

Higgs Associate, University of Edinburgh, UK
- 2020** **Martin Gutzwiller Fellow**, Max-Planck-Institut für Physik Komplexer Systeme (MPIPKS), Dresden, Germany.

Higgs Associate, University of Edinburgh, UK
- 2019** **Martin Gutzwiller Fellow**, MPIPKS, Dresden, Germany.

Higgs Associate, University of Edinburgh, UK
- 2018** **Higgs Associate**, University of Edinburgh, UK

MPIPKS, Dresden, Germany.
- 2017** **Higgs Associate**, University of Edinburgh, UK

MPIPKS, Dresden, Germany.
- 2016** **Kavli Institute for Theoretical Physics (KITP)**, Santa Barbara, CA.

Higgs Associate, University of Edinburgh, UK

Visiting Academic, **Imperial College**, London, UK.

Delta Institute of Theoretical Physics (DITP) Visiting Professor, Lorentz Centre, University of Leiden, NL.

MPIPKS, Dresden, Germany.
- 2015** **DITP** Visiting Professor, Lorentz Centre, University of Leiden, NL.

Visiting Academic, **Imperial College**, London, UK.

Distinguished Visitor of the Scottish Universities Physics Alliance (SUPA),
University of Aberdeen, UK.

2014 **Visiting Academic, Imperial College,** London, UK.

MPIPKS, Dresden, Germany.

KITP, Santa Barbara, CA.

2013 **Visiting Fellow, Isaac Newton Institute,** University of Cambridge, UK.

Visiting Scholar, Physics Department, University of California, Berkeley.

Member, Advanced Study Group (MPIPKS).

2012 **Visiting Scientist, IBM T. J. Watson Research Center,** Yorktown Heights, NY.

Member, Advanced Study Group (MPIPKS).

2011 **Visiting Professor,** Initiative for Theoretical Sciences at The Graduate Center of the
City University of New York.

Member, Advanced Study Group (MPIPKS).

2010 **KITP,** Santa Barbara, CA.

2009 **Invited Professor,** Universite Pierre et Marie Curie (Paris VI), Paris, France.

Invited Workshops:

2023 **Isaac Newton Institute** program: "New Statistical Physics of Living Matter:
Non-equilibrium States under adaptive control", Cambridge University, Cambridge, UK.

2023 **NORDITA** Workshop: "Hydrodynamics at All Scales", Stockholm, Sweden.

2022 **Lorentz Centre** Workshop "Active matter: the next 25 years", Leiden University, Leiden, NL.

2021 **Lorentz Centre** Workshop "Active matter: the next 25 years", Leiden University, Leiden, NL.*

2020 **Lorentz Centre** Workshop "Active matter: the next 25 years", Leiden University, Leiden, NL.*

*Postponed until 2022 due to pandemic.

- 2019** **Lorentz Centre** Workshop on "Hydrodynamics at all length scales", Leiden University, Leiden, NL.
- Higgs Centre** Workshop on Field theories of Active and Driven matter, Higgs Centre, University of Edinburgh, UK.
- Workshop on "Hydrodynamics: across the scales," **Enrico Fermi Institute**, University of Chicago. (Invitation declined due to conflict with above Edinburgh meeting.)
- 2018** **Institute for Mathematics and Its Applications** Program: "Liquid Crystals, Soft-matter Packing, and Active Systems: Materials and Biological Applications", University of Minnesota, Minneapolis, Minnesota.
- "Emergent Symmetries in Particle Physics, Cosmology and Condensed Matter Systems", **Niels Bohr Institute**, Copenhagen, Denmark.
- "EPSRC Centre for Doctoral Training in Fluid Dynamics Across the Scales", **Imperial College**, London, UK.
- Les Houches** summer school on Active Matter and Non-equilibrium Physics, Les Houches, France.
- 2017** Symposium in Honor of **Tom Lubensky**, University of Pennsylvania, Philadelphia, PA.
- 2016** **KITP** Program: "New Approaches to Non-equilibrium and Random Systems: KPZ Integrability, Universality, Applications and Experiments", University of California, Santa Barbara, California.
- 2015** **Co-organizer** of the International Workshop on "Active liquids", **Lorentz Centre**, Leiden University, Leiden, NL.
- Institute of Physics and Imperial College** Conference on "Physics of Emergent Behaviour II: from molecules to planets", Science Museum, London, UK.
- Conference on "Physics and biology of active systems", **University of Aberdeen**, Aberdeen, UK.
- Conference on "Physics of Active Matter", Center for Soft Condensed Matter Physics and Interdisciplinary Research, **Soochow University**, Suzhou, China.
- 2014** **KITP** Program: Active Matter: Cytoskeleton, Cells, Tissues and Flocks, Kavli Institute for Theoretical Physics, University of California, Santa Barbara, California.
- 2013** Workshop on "Mathematical Modelling and Analysis of Complex Fluids and Active Media in Evolving Domains", **Isaac Newton Institute** for Mathematical Sciences, University of Cambridge, Cambridge, UK.
- Summer school "Mathematical Approaches to Complex Fluids", **Isaac Newton Institute** for

Mathematical Sciences, University of Cambridge, Cambridge, UK.

2012 Workshop on "Growth and Form: Pattern Formation in Biology", **Aspen Center for Physics**, Aspen, CO.

- 2011** Workshop "Materials and the Imagination" (in honor of David Nelson), **Aspen Center for Physics**, Aspen, CO.
- "Theoretical physics and the phenomena of life: Optimization and emergent behavior", Initiative for Theoretical Sciences at **The Graduate Center of the City University of New York**.
- Lorentz Centre** Workshop "Fluctuations and Response in Active Materials: From Driven Granular Systems to Swarming Bacteria", University of Leiden, NL.
- 2010** "The Physics of Glasses: Relating Metallic Glasses to Molecular, Polymeric and Oxide Glasses", **Kavli Institute for Theoretical Physics**, Santa Barbara, CA.
- 2008** **Aspen Center for Physics**, Aspen, CO.
- 2007** **Aspen Center for Physics**, Aspen, CO.
- 2005** **Aspen Center for Physics**, Aspen, CO.
- 2004** **Aspen Center for Physics**, Aspen, CO.
- 2003** **Kavli Institute for Theoretical Physics**, Santa Barbara, CA.
- 2000** **Aspen Center for Physics**, Aspen, CO.
- 1998** **Aspen Center for Physics**, Aspen, CO.
- 1997** **Center for Chaos and Complexity**, Boulder, CO.
- 1996** **Aspen Center for Physics**, Aspen, CO.
- 1995** **Aspen Center for Physics**, Aspen, CO.
- 1994** **Institute for Theoretical Physics**, Santa Barbara, CA.
- Isaac Newton Institute** for Mathematical Sciences, University of Cambridge, Cambridge, UK.
- 1992** **Aspen Center for Physics**, Aspen, CO.
- 1989** **Institute for Theoretical Physics**, Santa Barbara, CA.
- 1988** **Aspen Center for Physics**, Aspen, CO.
- 1985** **Aspen Center for Physics**, Aspen, CO.
- 1984** **Aspen Center for Physics**, Aspen, CO.
- 1983** **Aspen Center for Physics**, Aspen, CO.

1981 French-American Workshop on liquid crystals, Sunapee, N. H.

Selected Invited talks:

2025 Invited talk at the **Flatiron Institute**, New York.

2024 **Imperial College**, London, UK

Max-Planck-Institut fur Physik Komplexer Systeme
(**MPIPKS**), Dresden, Germany.

2023 **NORDITA** Workshop: "Hydrodynamics at All Scales", Stockholm, Sweden.

University of Oregon Physics Department Colloquium

2022 **Lorentz Centre** Workshop "Active matter: the next 25 years", Leiden University, Leiden, NL.

University of Oregon Physics Department Colloquium

Physics Department Colloquium, **Brown University**, Providence, RI, U.S.A.*

2021 Online Public Seminar organized by "The Simons collaboration on Cracking the glass problem".

Widely Applied Math Seminar, **Harvard University**.

Lorentz Centre Workshop "Active matter: the next 25 years", Leiden University, Leiden, NL.**

Physics Department Colloquium, **University of California at San Diego**, CA, U.S.A.

Physics Department Colloquium, **Brown University**, Providence, RI, U.S.A.**

Two guest lectures at **Northeastern University** for the course "Biological Physics 2".

Lars Onsager Prize talk, at APS Virtual March Meeting.

2020 Widely Applied Math Seminar, **Harvard University***.

Lorentz Centre Workshop "Active matter: the next 25 years", Leiden University, Leiden, NL.**

Physics Department Colloquium, **University of California at San Diego**, CA, U.S.A.**

Physics Department Colloquium, **Brown University**, Providence, RI, U.S.A.**

Lars Onsager Prize talk, at APS March Meeting, Denver, CO, U.S.A. (Meeting cancelled).*

Gutzwiller Fellow Colloquium, **MPIPKS**, Dresden, Germany.

*Postponed until 2021 due to pandemic.

**Postponed until 2022 due to pandemic.

2019 **College de France** invited seminar, and scientific visit to **Ecole Normale Supérieure**, Paris, France.

Invited seminar and scientific visit, **Max Planck Institute for Dynamics and Self-Organization**, Göttingen, Germany.

Lorentz Centre Workshop on "Hydrodynamics at all length scales", Leiden University, Leiden, NL.

Higgs Centre Workshop on Field theories of Active and Driven matter, Higgs Centre, University of Edinburgh, UK.

Workshop on "Hydrodynamics: across the scales," **Enrico Fermi Institute**, University of Chicago, Chicago, IL, U.S.A. (Invitation declined due to conflict with above Edinburgh meeting.)

2018 **Institute for Mathematics and Its Applications** Program: "Liquid Crystals, Soft-matter Packing, and Active Systems: Materials and Biological Applications", University of Minnesota, Minneapolis, Minnesota.

Invited talk at **Liquid Crystal Institute, Kent State University**, Kent, Ohio.

Two invited talks at **Niels Bohr Institute**, Copenhagen, Denmark.

Invited talk at **University of Barcelona**, Spain.

Two invited lectures at the **EPSRC Centre** for Doctoral Training in Fluid Dynamics Across the Scales, **Imperial College**, London, UK

Les Houches summer school on Active Matter and Non-equilibrium Physics, Les Houches, France

2017 **Frontiers of Condensed Matter Physics (FCMP)** (simultaneously broadcast lecture to Universities of Oregon and California, Berkeley, and Columbia University).

Invited talk at **APS March Meeting**, New Orleans, LA, U.S.A.

Invited talk at Symposium in Honor of Tom Lubensky, University of Pennsylvania, Philadelphia, PA, U.S.A.

Biophysics Group Seminar, **Max Planck Institute for the Physics of Complex Systems**, Dresden, Germany.

Kolloquium der Sächsischen Forschergruppe FOR 877 und Physikalishches Sonderkolloquium
Technical University Chemnitz, Chemnitz, Germany.

2016 **KITP** Program: "New Approaches to Non-equilibrium and Random Systems: KPZ Integrability, Universality, Applications and Experiments", University of California, Santa Barbara, California, U.S.A.

EPSRC Centre for Doctoral Training in Fluid Dynamics Across the Scales, Imperial College London, UK

Joan van der Waals Colloquium, **Lorentz Centre**, University of Leiden, NL.

Biophysics Group Seminar, **Max Planck Institute for the Physics of Complex Systems**, Dresden, Germany.

2015 Condensed matter seminar, **Lorentz Centre**, University of Leiden, Leiden, NL.

Physics Colloquium, **Edinburgh University**, Edinburgh, UK.

Condensed matter seminar, **Oxford University**, Oxford, UK.

Institute of Physics and Imperial College Conference on "Physics of Emergent Behaviour II: from molecules to planets", Science Museum, London, UK.

Conference on "Physics and biology of active systems", **University of Aberdeen**, Aberdeen, UK.

Condensed matter seminar, **Edinburgh University**, Edinburgh, UK.

Conference on "Physics of Active Matter", **Center for Soft Condensed Matter Physics and Interdisciplinary Research**, **Soochow University**, Suzhou, China.

2014 Mathematical Physics Seminar, **Imperial College**, London, UK.

Biophysics Group Seminar, **Max Planck Institute for the Physics of Complex Systems**, Dresden, Germany.

Condensed matter seminar, **Heinrich-Heine-Universität**, Dusseldorf, Germany.

Physics Colloquium, **Oregon State University**, Corvallis, Oregon.

KITP Program: "Active Matter: Cytoskeleton, Cells, Tissues and Flocks,"
University of California, Santa Barbara, California.

15th Mini Stat Mech Meeting, **University of California, Berkeley**, CA.

2013 **Ehrenfest Colloquium, Lorentz Centre**, University of Leiden, NL.

Isaac Newton Institute for Mathematical Sciences, University of Cambridge, Cambridge, UK.

Advanced Study Group on Active Matter, **MPIPKS**, Dresden, Germany.

London Centre for Nanotechnology, University College London, University of London, UK.

290K Seminar, **University of California**, Berkeley, CA.

2012 Condensed Matter Seminar, **University of Colorado**, Boulder, CO.

Center for Nonlinear Studies Colloquium, Los Alamos National Laboratory,
Los Alamos, NM.

Active Soft and Biological Matter: A Conference in Honour of Jacques Prost,
Ecole de Physique des Houches, Les Houches, France.

Advanced Study Group on Active Matter, **Max Planck Institute for the Physics of
Complex Systems**, Dresden, Germany (I presented two talks).

**Kolloquium der Sächsischen Forschergruppe FOR 877 und Physikalishches
Sonderkolloquium, Technical University Chemnitz**, Chemnitz, Germany.

2011 Collective dynamics and pattern formation in active matter systems, **MPIPKS**, Dresden, Germany.

Fluctuations and response in active materials: From driven granular systems
to swarming bacteria, **Lorentz Centre**, University of Leiden, Leiden, NL.

Widely Applied Math Seminar, **Harvard University**, Cambridge, MA.

Condensed Matter Seminar, **Harvard University**.

Condensed Matter Seminar, **Princeton University**, Princeton, NJ.

Condensed Matter Physics Seminar, **Yale University**, New Haven, CT.

Condensed Matter Seminar, **City University of New York**.

Workshop on emergent phenomena in biological systems,
Initiative for Theoretical Science at the **City University of New York**.

Lecture Series:

2025 **University of Massachusetts Summer School on "Soft Solids and Complex Fluids"**,
"Birth, death, and flight: The hydrodynamics of dry active matter", UMass Amherst, June 2025.

2024 **Higgs Centre** , University of Edinburgh, "Navier-Stokes for the birds: a how to guide to
formulating the hydrodynamic equations for flocks (aka the "Toner-Tu equations")".

2023 **Higgs Centre** , University of Edinburgh, "The How and Why of the Dynamical
Renormalization Group illustrated via the KPZ equation".

2022 **Boulder school for condensed matter and materials physics**,
"Hydrodynamics Across Scales: From Quantum Fluids and Complex Liquids to Climate Dynamics ",
University of Colorado, Boulder, CO (Invitation declined due to prior commitments.)

2018 **EPSRC Centre for Doctoral Training in Fluid Dynamics Across the Scales**,
Imperial College, London, UK

Les Houches summer school on Active Matter and Non-equilibrium Physics,
Les Houches, France.

2016 **EPSRC Centre for Doctoral Training in Fluid Dynamics Across the Scales**,
Imperial College, London, UK

2015 **Boulder school for condensed matter and materials physics**,
"Soft Matter In and Out of Equilibrium", University of Colorado, Boulder, CO

Lecture series presented as a **Distinguished Visitor of the Scottish Universities**, Aberdeen, UK.

2013 Lecture series presented as part of the summer school associated with the program:
"Mathematical modelling and analysis of complex fluids and active media in evolving domains",
Isaac Newton Institute for Mathematical Sciences, University of Cambridge, Cambridge, UK.

2009 Workshop on "Statistical physics of active matter " January 5th - February 6th, 2009
Institut Henri Poincare, Universite Pierre et Marie Curie, Paris, France

1986 Summer school "Du Cristal a l'Amorphe", St. Pierre Quiberon, France

Funding

- 1996-1999:** PI on: “ Strongly fluctuating extended systems: Flocks, membranes, and liquid crystals”, National Science Foundation DMR 9634596 , \$195,000.
- 1999-2002:** PI on: “ Fluctuation effects in disordered, non-equilibrium, and biological systems”, National Science Foundation DMR 9980123 , \$195,000.
- 2008:** PI on: “ Phase transitions in dislocated crystals ”
University of Oregon Summer Research Award.
- 2010-2013:** Co-PI with Raghuvver Parthasarathy on:
“ Liquid membrane microrheology”, National Science Foundation 1006171 , \$375,000.
- 2011-2013:** Co-PI with Oriol T. Valls of the University of Minnesota, Chandan Dasgupta of the Indian Institute of Science, and Surajit Sengupta of the Indian Association for the Cultivation of Science on:
“ Joint India-US Center on the dynamics of dislocations in solid 4He and its Role in supersolid Behavior”, Indo-US Science and Technology Forum (IUSSTF) JC-94-2010, \$80,787.
- 2011-2014:** PI, with co-PI’s Meredith Betterton of the University of Colorado, Boulder, and Yu-hai Tu of the IBM T. J. Watson Research Center, on:
“ Collaborative research: hydrodynamic theories of the dynamics, fluctuations, boundaries, and shapes of flocks”, U. S. National Science Foundation, NSF EF 1137815, \$748,746
- 2012-2013:** PI on: “Hydrodynamic approaches to glasses and active matter ”,
Simons Foundation 225579, \$112,973.
- 2014-2015:** PI on: Subaward 1551698 to “ Collaborative research: hydrodynamic theories of the dynamics, fluctuations, boundaries, and shapes of flocks”,
U. S. National Science Foundation, NSF EF 1137815, \$100,000
- 2015:** Co-PI, with Francesco Ginelli of University of Aberdeen, on:
“ SUPA Distinguished Visitor Award”, Scottish Universities Physics Alliance, 3,000GBP $\approx$ \$5,000.
- 2017:** Co-PI on a preproposal with Oleg Lavrentovich of the Liquid Crystal Institute at Kent State University for a Keck Foundation grant for a project entitled:
”Command of active matter by liquid crystals”.
- 2018:** Co-PI on a preproposal with Oleg Lavrentovich of the Liquid Crystal Institute at Kent State University for a Keck Foundation grant for a project entitled:
”Command of active matter by liquid crystals”.
- 2019:** Co-PI, with C.F. Lee of **Imperial College**, London, UK, and Leiming Chen, of the China University of Mining and Technology, on a National Science Foundation of China grant on “Hydrodynamic theories of active matter”, in preparation.

2019-20: **Martin Gutzwiller Fellow**, Max Planck Institute for the Physics of Complex Systems (MPIPKS), Dresden. The stipend supported a visit of six months, plus travel, which came to \$50K. An extra three month visit was cancelled due to the pandemic.

Teaching

I regularly teach graduate level theoretical mechanics, and statistical mechanics, as well as a full year advanced topic course on theoretical condensed matter physics, including hydrodynamics and the renormalization group. I have taught undergraduate classes, and been invited as a guest lecturer in classes taught by my colleagues. I am invariably one of the most highly rated teachers in our department (by student evaluations). I also supervise Ph.D. students and postdocs.

Since March 2021, I have been supervising a Ph.D. student, Maxx Miller, whose thesis will treat a number of projects related to Active Matter.

In Winter 2023, I supervised a UO senior Physics major (Audrey Quinn) in a research project on flocking.

In 2022, I served as referee on the jury for the Ph.D. thesis of Marc Besse at Sorbonne University in Paris, France.

Professional service:

In 2020, I was appointed to the Scientific Advisory Board (SAB) of the Max Planck Institute for Dynamics and Self-Organization (MPIDS) in Göttingen, Germany (six year term). I attended several meetings of the board between April and October 2022, including one with the president of the Max Planck Society of Germany, and participated in the writing of several reports during that period. The SAB has also been extensively involved in the MPIDS search for a new director.

I am active as a referee for, among others, the Physical Review journals, Journal de Physique, Nature, Proceedings of the National Academy of Sciences, Europhysics Letters, Journal of Statistical Mechanics, Journal of Statistical Physics, Science, Proceedings of the Royal Society, and Journal of Physics. I also review grant proposals for a variety of federal, international, and private agencies (e.g., US NSF, Israeli Science Foundation).

I regularly write recommendation letters for present and former UO students (both graduate and undergraduate), postdocs, and colleagues (for over three dozen people in the past three years, amounting to over 100 letters). I have also successfully nominated a number of colleagues for prestigious prizes, including the Buckley Prize (David Nelson, Tom Lubensky, Noel Clark, and Bob Meyer), and the inaugural IUPAP Medal for the Physics of Life (Frank Jülicher) (2023).

I am frequently consulted by Universities and laboratories around the world asking for advice about, and reports on, candidates for hiring and promotion.

I served as an outside member on an ad hoc review committee at Brandeis University in March 2017. The committee considered the case for tenure, and promotion to associate professor, of Aparna Baskaran in the Department of Physics there.

In 2015, I co-organized the "Active Liquids" workshop, which took place at the Leiden Lorentz Centre at the University of Leiden in September 2015.

My department service includes faculty hiring, personnel, promotion, post-tenure review, awards, graduate studies, and qualifier exam committees. I have also served on two ad hoc 3rd/6th year review committees. In addition, I have organized our departmental Colloquium series. I regularly serve on many Ph.D. thesis committees, in Physics, Chemistry, Geology, and Biology. I also mentor Ph.D. students, and have (successfully) mentored young faculty who were having teaching

difficulties. With faculty in Physics, Geology, Biology, and Chemistry here at UO, I co-organized a seminar series on fluid mechanics.

At the University level, I have regularly served on the Goldwater Scholarship Committee, which has over the years successfully nominated dozens of UO undergraduates for this prestigious nationwide scholarship.

Outreach:

As part of Prof. Tien-Tien Yu's "Science and Comics fellowship" project, I collaborated with an undergraduate artist, Madison Ellis, on the creation of a comic strip describing my work on flocking. This was posted on a website, and exhibited at the Jordan Schnitzer museum, and in one of the galleries in downtown Eugene that hosts the "first Friday Art walks". I have also frequently given interviews to local, national, and international journalists about my work.

Publications

1. **Smectic, cholesteric and Rayleigh-Benard order in two dimensions**, J. Toner and D. R. Nelson, Phys. Rev. B **23**, 316 (1981).
2. **Bond-orientational order, dislocation loops, and melting of solids and smectic A liquid crystals**, D. R. Nelson and J. Toner, Phys. Rev. B **24**, 363 (1981).
3. **Renormalization group treatment of the dislocation loop model of the smectic A-nematic transition**, J. Toner, Phys. Rev. B **26**, 462 (1982).
4. **Viscosities diverge as $1/\omega$ in smectic-A liquid crystals**, G. F. Mazenko, S. Ramaswamy and J. Toner, Phys. Rev. Lett. **49**, 51 (1982).
5. **Dynamics of 2d anisotropic solids, smectics, and nematics**, S. Ostlund, J. Toner and A. Zippelius, Ann. Phys. **144**, 345 (1982).
6. **Bond-orientationally ordered phases that scatter light strongly**, J. Toner, Phys. Rev. A **27**, 1157 (1983).
7. **Breakdown of conventional hydrodynamics for smectic-A, hexatic-B, and cholesteric liquid crystals**, G. F. Mazenko, S. Ramaswamy and J. Toner, Phys. Rev. A **28**, 1618 (1983).
8. **Breakdown of conventional hydrodynamics in three dimensional systems with long-ranged two-dimensional translational order**, S. Ramaswamy and J. Toner, Phys. Rev. A **28**, 3159 (1983).
9. **Dislocation-loop theory of the nematic-smectic A-smectic C multicritical point**, G. Grinstein and J. Toner, Phys. Rev. Lett. **51**, 2386 (1983).
10. **Anharmonic effects on the dynamics of two dimensional anisotropic melting**, J. Toner, Phys. Rev. A **30**, 636 (1984).
11. **Smectics A and C are always glasses**, S. Ramaswamy and J. Toner, Phys. Rev. Lett. **53**, 477 (1984).
12. **Substrate induced orientational order in the isotropic phase of liquid crystals**, A. Mauger, G. Zribi, D. L. Mills, and J. Toner, Phys. Rev. Lett. **53**, 2485 (1984).
13. **Hydrodynamic theory of the glass transition**, S. Das, G. F. Mazenko, S. Ramaswamy and J. Toner, Phys. Rev. Lett. **54**, 118 (1985).
14. **Elasticity and dislocations in pentagonal and icosahedral quasicrystals**, D. Levine, T. C. Lubensky, S. Ostlund, S. Ramaswamy, P. J. Steinhardt, and J. Toner, Phys. Rev. Lett. **54**, 1520 (1985).
15. **Reply to “Comment on ”dislocation-loop theory of the nematic-smectic A-smectic C multicritical point”**, G. Grinstein and J. Toner Phys. Rev. Lett. **54**, 1732 (1985).
16. **Reply to “Comment on dynamical theories of the liquid-glass transition”**, S. Das, G. F. Mazenko, S. Ramaswamy and J. Toner, Phys. Rev. A **32**, 3139 (1985).
17. **The Sound of making glass**, J. Toner, New Scientist, #1476, p. 37 (1985).

18. **Hydrodynamics of icosahedral quasicrystals**, T. C. Lubensky, S. Ramaswamy, and J. Toner, Phys. Rev. B **54**, 7444 (1985).
19. **Defect mediated melting and new phases in three dimensional systems with a Single Soft Direction**, G. Grinstein, T. C. Lubensky, and J. Toner, Phys. Rev. B **33**, 3306 (1986).
20. **Dislocation motion in quasicrystals and implications for macroscopic properties**, T. C. Lubensky, S. Ramaswamy, and J. Toner, Phys. Rev. B **33**, 7715 (1986).
21. **Commensurate and incommensurate vortices in X-Y models**, D. H. Lee, G. Grinstein, and J. Toner, Phys. Rev. Lett. **56**, 2318 (1986).
22. **Systematics of disorder in quasiperiodic material**, P. M. Horn, W. Malzfeldt, D. P. DiVincenzo, J. Toner, and R. Gambino, Phys. Rev. Lett. **57**, 1444 (1986).
23. **Deterministic, fractal defect structures in close packings of hard disks**, G. Y. Onoda and J. Toner, Phys. Rev. Lett. **57**, 1340 (1986).
24. **Fractal dimensions of model particle packings having multiple generations of agglomerates**, G. Y. Onoda and J. Toner, Comm. Amer. Ceram. Soc. C **69**, 278 (1986).
25. **Close packings of uniform disks with perfect orientational order**, G. Y. Onoda and J. Toner, Phys. Rev. B **35**, 3437 (1987).
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