

Ricard Alert

ICREA Research Professor

Departament de Física de la Matèria Condensada
Universitat de Barcelona
C/Martí i Franquès 1, 08028 Barcelona

<https://ricardalertzenon.wixsite.com/ricardalertzenon>

Education

- 2013 – 2017 **Ph.D. in Physics**, Universitat de Barcelona (Spain), *Outstanding award*.
- 2012 – 2013 **Master's in Biophysics**, Universitat de Barcelona (Spain), *Outstanding award*.
- 2007 – 2012 **Llicenciatura in Physics**, Universitat de Barcelona (Spain), *Outstanding award*.

Positions

- 2025 – present **ICREA Research Professor**, Universitat de Barcelona (Spain).
- Oct-Nov 2025 **Serra Hùnter Distinguished Professor**, Universitat de Barcelona (Spain).
- 2022 – 2026 **Max Planck Research Group Leader**, Max Planck Institute for the Physics of Complex Systems (MPI-PKS), Dresden (Germany).
Also at: Center for Systems Biology Dresden (CSBD),
Cluster of Excellence Physics of Life (PoL), Technische Universität Dresden.
- 2018 – 2021 **Postdoctoral fellow**, Princeton University (USA).
Princeton Center for Theoretical Science, and Lewis-Sigler Institute for Integrative Genomics.
- 2013 – 2017 **Ph.D. student**, Prof. Jaume Casademunt, Universitat de Barcelona (Spain).
- 2015 – 2016 **Visiting Ph.D. student**, Prof. Jacques Prost, Institut Curie, Paris (France).
- Jul-Oct 2013 **Visiting student**, Dr. Jure Dobnikar, Prof. Daan Frenkel, University of Cambridge (UK).
- 2012 – 2013 **Research internship**, Dr. Pietro Tierno, Prof. Jaume Casademunt, Univ. de Barcelona.

Selected awards

- 2025 **Young Investigator Prize in Theoretical Physics**, by Real Sociedad Española de Física.
- 2025 **Soft Matter Emerging Investigator**, by the journal Soft Matter.
- 2024 **Finalist Princesa de Girona Research Prize**, by Fundació Princesa de Girona.
- 2023 **Early Career Scientist Prize in Biological Physics**, by IUPAP.
- 2022 **Antalgenics Prize 2022**, by the Sociedad Española de Biofísica.
- 2021 **Emerging Talents 2021**, by the Journal of Physics A.
- 2020 **John Archibald Wheeler Fellow**, by the Princeton Center for Theoretical Science.
- 2019 **Biological Physics Doctoral Thesis Award**, runner-up, by the American Physical Society.
- 2019 **Jorge Wagensberg Award**, Best Doctoral Thesis in Complex Systems, by complexitat.cat.
- 2018 – 2021 **Human Frontier Science Program**, 3-year Cross-disciplinary postdoctoral fellowship.
- 2018 – 2021 **Princeton Center for Theoretical Science**, 3-year postdoctoral fellowship.
- 2016 **Development Travelling Fellowship**, The Company of Biologists, to visit Institut Curie.
- 2015 **EMBO Short-Term Fellowship**, to visit Institut Curie.
- 2013 – 2017 **Fundació La Caixa**, 4-year Ph.D. fellowship.

Funding

- 2024 – 2029 **ERC Starting Grant.** European Research Council.
2022 – 2027 **Max Planck Research Group.** Max Planck Society.

Research consortia

- 2023 – 2026 **Cluster of Excellence Physics of Life, TU Dresden.** Co-leader of the research area “Energy and Information Flows in Active Matter” in the application for the cluster renewal.

Teaching

- 2025 – 2026 **Biophysics,** Universitat de Barcelona, 4th-year undergraduate.
2023 – 2025 **Pattern Formation in Biology,** TU Dresden, Master’s “The Physics of Life”.
2022 – 2025 **Advanced Biological Physics,** TU Dresden, Master’s “The Physics of Life”.
2022 **Hypothesis-Driven Research: The Active Matter Physics of Collective Cell Behaviors,** Training Program in Quantitative Biology and Ecology, ICTP-SAIFR, São Paulo, Graduate.
2019 – 2020 **Mathematical Models in Biology,** Prof. Yigal Meir, Princeton University, Undergraduate.
2018 – 2019 **Biophysics,** Prof. William Bialek, Princeton University, Graduate.
2015 – 2016 **Biophysics,** Prof. Marta Ibañes, Universitat de Barcelona, 4th-year undergraduate.
2013 – 2017 **International Physics Olympiad,** Theory and lab training for high-school students.

Supervision

- Ph.D. students L. Hahn (2024 - present), H. Hennighausen, P. Hampshire, A. Matevosyan (2022 - present)
Master’s T. Welker (2023 - 2024), E. Maximova (2022), O.L. Canton (2020)
Undergraduate T. Welker (2023), J.D. McEnany (2019)
Postdocs S. Bhattacharyya (2025 - present), M-J. Franco-Oñate (2023 - present), M. Hillebrand (2023 - 2024), J. Hutchinson, S. Das (2022 - 2024)
Visitors D. Lang (2025), S. Grosser (2025), I. Pi-Jaumà (2024)

Research schools and programs

- 2024 **KITP Program. Active Solids: From Metamaterials to Biological Tissue.** Santa Barbara (USA).
2024 **INI Program. Anti-diffusive Dynamics: From Sub-cellular to Astrophysical Scales.** Cambridge (UK).
2023 **INI Program. New Statistical Physics in Living Matter: Non-equilibrium States under Adaptive Control.** Cambridge (UK).
2020 **KITP Program. Symmetry, Thermodynamics, and Topology in Active Matter.** Santa Barbara (USA).
2018 **Les Houches Summer School. Active matter and nonequilibrium statistical physics.** École de Physique des Houches (France).

- 2014 **Beg Rohu Summer School. Nonequilibrium statistical mechanics and active matter.** St. Pierre Quiberon (France).

Event organization

- 2021 **PCTS workshop. The Physics of Living Matter: From Physical Properties to Biological Function.** Princeton Center for Theoretical Science (USA).
- 2020 **PCTS workshop. The Physics of Collective Cell Migration.** Princeton Center for Theoretical Science (USA).

Refereeing activity

- Papers Nature (1), Nat. Phys. (4), PNAS (3), Nat. Commun. (2), Phys. Rev. X (2), Phys. Rev. Lett. (10), Phys. Rev. X Life (2), eLife (2), Newton (1), Curr. Biol. (1), PNAS Nexus (1), Biophys. J. (1), Soft Matter (2), J. Chem. Phys. (1), Commun. Phys. (1), Phys. Rev. E (1), Phys. Rev. Fluids (1), Front. Phys. (1), PLoS Comput. Biol. (1), J. Stat. Phys. (1).
- Books Taylor & Francis Books (1), Oxford University Press (2).
- Grants Israel Science Foundation (1).
- Workshops CECAM (1).

Invited talks at conferences

- 2025 **Internal durotaxis and asymmetric shapes of cell clusters.** Coarse-Graining Tissue Mechanics, Ljubljana (Slovenia).
- 2025 **Internal durotaxis and asymmetric shapes of cell clusters.** Active Matter, Leiden (The Netherlands).
- 2025 **Discontinuous transition to active nematic turbulence.** Statistical Physics of Active Matter, Paris (France).
- 2025 **Internal durotaxis and asymmetric shapes of cell clusters.** Gordon Research Conference on Directed Cell Migration, Castelvecchio Pascoli (Italy).
- 2024 **Durotaxis and frictiotaxis.** Cell and Tissue Mechanics: Modeling meets Experiments, BIRS, Hangzhou (China).
- 2024 **Frictiotaxis.** Theoretical Principles of Life, EMBL, Barcelona (Spain).
- 2024 **Directed motion in active matter: Frictiotaxis and flocking.** Active solids: From meta-materials to biological tissue, KITP, Santa Barbara (USA).
- 2024 **Capillary interactions organize bacterial colonies.** Anti-diffusion in multiphase and active flows, Cambridge (UK).
- 2024 **Capillary interactions organize bacterial colonies.** Postdoc Day, Université de Genève (Switzerland).
- 2024 **Flocking by turning away.** Interdisciplinary challenges in non-equilibrium physics: from soft to active, biological and complex matter, Dresden (Germany).
- 2024 **Flocking by turning away.** DPG Meeting, Berlin (Germany).
- 2024 **Durotaxis and frictiotaxis.** APS March Meeting, Minneapolis (USA).
- 2023 **From topological defects to fruiting bodies in bacterial colonies.** Bridging the Divide, Augsburg (Germany).

- 2023 **Durotaxis and frictiotaxis.** New statistical physics in living matter: non-equilibrium states under adaptive control, Cambridge (UK).
- 2023 **Durotaxis and frictiotaxis.** International Conference on Biological Physics, Seoul (South Korea).
- 2023 **Durotaxis and frictiotaxis.** 9th International Discussion Meeting on Relaxations in Complex Systems, Chiba (Japan).
- 2023 **Frictiotaxis.** Summer Life Sciences Conference, Dresden (Germany).
- 2023 **Active turbulence.** From Soft Matter to Biophysics, Les Houches (France).
- 2022 **From topological defects to fruiting bodies in bacterial colonies.** Paris Biological Physics Community, Paris (France).
- 2022 **From topological defects to fruiting bodies in bacterial colonies.** Beginner Scientists at the Interface of Physics and Biology, Online.
- 2022 **Turning toward the crowd: Active phase separation based on non-reciprocal torques.** Active Matter: The next 25 years, Leiden (The Netherlands).
- 2022 **From topological defects to fruiting bodies in bacterial colonies.** 8th International Iberian Biophysics Congress, Bilbao (Spain).
- 2021 **Stability of chemotactic fronts.** International Conference on Free Boundary Problems: Theory and Applications, Berlin (Germany)
- 2021 **From topological defects to fruiting bodies in bacterial colonies.** APS March Meeting, Online (USA).
- 2021 **The Physics of Active and Living Matter.** Max Planck Research Group Selection Symposium (Germany).
- 2020 **Topological defects induce layer formation in bacterial colonies.** The Physics of Collective Cell Migration (organizer and speaker), Princeton, NJ (USA).
- 2019 **Active wetting of epithelial tissues.** VIII complexitat.cat, Barcelona (Spain).
- 2019 **Active wetting of epithelial tissues.** APS March Meeting, Boston, MA (USA).

Invited seminars and colloquia

- 2026 **Physics Colloquium. Capillary aggregation and surface waves in bacterial colonies.** Laboratoire de Physique, ENS Lyon (France).
- 2025 **Capillary aggregation and surface waves in bacterial colonies.** The Turing Centre for Living Systems, CENTURI, Marseille (France).
[Journal of Biological Physics](#) (Online).
- 2025 **Turbulence, aggregation, and surface waves in active fluids.** Department of Applied Mathematics and Theoretical Physics (DAMPT), University of Cambridge (UK).
- 2025 **Hydrated active matter.** Departament de Física de la Matèria Condensada, University of Barcelona (Spain).
- 2025 **Mechanical guidance of cell migration.** Nature Publishing Group (Online).
- 2024 **Continuum model of collective cell migration.** Teaching Day on Mathematical Modeling of Cell Colonies, Aachen (Germany).
- 2024 **Directed motion in active matter: Frictiotaxis and Flocking.** Institute of Science and Technology, Vienna (Austria).

- APS Editors Physics of Living Systems Seminar (Online).
Center for Mathematical Sciences and Applications, Harvard University (USA).
- 2023 **Physics Colloquium. Active Fluids: Topological Defects, Frictiotaxis, and Flocking.** Faculty of Physics, Universitat de Barcelona (Spain).
- 2023 **Durotaxis and frictiotaxis.** Mechanobiology Institute, Singapore (Singapore).
- 2023 **Physics Colloquium. Active Fluids: Topological Defects, Turbulence, and Phase Separation.** Department of Physics, Universität Augsburg (Germany).
- 2022 **Active Fluids: Topological Defects, Turbulence, and Phase Separation.**
Rudolf Peierls Centre for Theoretical Physics, Oxford University (UK).
The Turing Centre for Living Systems, CENTURI, Marseille (France).
Institute for Polymer Research, Dresden (Germany).
CeNS Colloquium. Ludwig-Maximilians Universität, Munich (Germany).
- 2021 **The Physics of Living Matter.** DCEXS, Universitat Pompeu Fabra (Spain).
- 2021 **From topological defects to fruiting bodies in bacterial colonies.** Biological Physics / Physical Biology Seminars (Online, Worldwide).
- 2021 **Cell colonies as active fluids: From bacterial biofilms to epithelial tissues.** Max Planck Institute for Cell Biology and Genetics, Dresden (Germany).
- 2021 **Active Fluids: Topological Defects, Turbulence, and Phase Separation.**
Instituut-Lorentz for Theoretical Physics, Universiteit Leiden (The Netherlands).
Department of Mechanical and Aerospace Engineering, University of California at San Diego (USA).
Theory of Living Systems Webinar, Australia & New Zealand (Online, Worldwide).
Racah Institute of Physics, Hebrew University of Jerusalem (Israel).
Department of Physics & Astronomy, Rice University (USA).
Department of Physics, University of California at Berkeley (USA).
- 2020 **Cell colonies as active fluids: From bacterial biofilms to epithelial tissues.** School of Life Sciences, University of Dundee (UK).
- 2020 **Active Fluids: Topological Defects, Turbulence, and Phase Separation.**
ICQMB, University of California at Riverside (USA).
Laboratoire de Physique, ENS Lyon (France).
Max Planck Institute for the Physics of Complex Systems, Dresden (Germany).
Department of Mathematics, MIT (USA).
Department of Physics, Technion (Israel).
LPTMS, Université Paris-Saclay (France).
Laboratoire de Matière et Systèmes Complexes, Université Paris-Diderot (France).
Quantitative Biology Institute, Yale University (USA).
Département de Physique, ENS Paris (France).
Institut Lumière-Matière, Université Claude Bernard - Lyon 1 (France).
Rudolf Peierls Centre for Theoretical Physics, Oxford University (UK).
- 2020 **From topological defects to fruiting bodies in colonies of migrating bacteria.**
Cell Migration Seminars (Online, Worldwide).
Laboratoire de Physique et Mécanique des Milieux Hétérogènes, ESPCI (France)

- 2020 **Donald R. Hamilton Colloquium. The Physics of Collective Cell Migration.** Department of Physics, Princeton University (USA).
- 2019 **Topological defects induce layer formation in bacterial colonies.** Center for Mathematics of Living and Mimetic Matter, Pennsylvania State University (USA).
- 2019 **Motility-induced phase separation by orientational interactions in active colloids.** Department of Condensed Matter Physics, Universitat de Barcelona (Spain).
- 2019 **Active wetting of epithelial tissues.** Harvard School of Public Health (USA).
- 2019 **Active wetting and fingering of epithelial tissues.** Physics Department, University of Pennsylvania (USA).
- 2017 **Active wetting of epithelial tissues.**
Lewis-Sigler Institute for Integrative Genomics, Princeton University (USA).
Max Planck Institute for the Physics of Complex Systems, Dresden (Germany)
- 2017 **Fluidization and active thinning by molecular kinetics in active gels.**
Laboratoire Interdisciplinaire de Physique, Université Grenoble-Alpes (France).
Laboratori de Càlcul Numèric, Universitat Politècnica de Catalunya (Spain).

Contributed talks at conferences

- 2026 **Collective cell migration as active wetting.** From Adaptive to Active Wetting, Dresden (Germany).
- 2025 **Discontinuous transition to active nematic turbulence.** StatPhys29, Florence (Italy).
- 2025 **Capillary interactions organize bacterial colonies.** DPG Meeting, Regensburg (Germany).
- 2024 **Frictiotaxis: A new tactic behavior.** Chemotaxis — from basic Physics to Biology, Dresden (Germany).
- 2023 **Frictiotaxis underlies adhesion-independent durotaxis.** Physics of Cancer, Leipzig (Germany).
- 2023 **Bacterial fruiting bodies: Capillary interactions, topological defects, and active force fluctuations.** StatPhys 28, Tokyo (Japan).
- 2023 **Stability of chemotactic fronts.** Active Matter at Surfaces and in Complex Environments, Dresden (Germany).
- 2023 **Turning toward the crowd: Active phase separation based on non-reciprocal torques.** New Perspectives in Active Systems, Dresden (Germany).
- 2023 **Optimal collective durotaxis through active wetting.** DPG meeting, Dresden (Germany).
- 2022 **Migrating into new morphologies.** Interdisciplinary life of microbes: From single cells to multicellular aggregates, Dresden (Germany).
- 2022 **Optimal collective durotaxis through active wetting.** From Physics to Function, Buxted Park (UK).
- 2022 **Following the stiff path. Stiffness-dependent active wetting enables optimal collective durotaxis.** Physics of Living Matter 16, Marseille (France).
- 2022 **Turning toward the crowd: Active phase separation based on non-reciprocal torques.** Active & Intelligent Matter, Erice (Italy).

- 2022 **Cellular sensing governs the stability of chemotactic fronts.** APS March Meeting, Chicago, IL (USA).
- 2021 **From topological defects to fruiting bodies in bacterial colonies.** Physics meets Biology, Oxford (UK).
- 2021 **Bacteria exploit physics to resist starvation.** HFSP awardees meeting (Online).
- 2021 **Cell colonies as active fluids: From bacterial colonies to epithelial tissues.** EMBL Summer Workshop for Early-Career Researchers, Barcelona (Spain).
- 2021 **Steering toward the crowd: Orientational interactions induce active phase separation.** APS March Meeting, Online (USA).
- 2019 **Active wetting of epithelial tissues.** Physics of Active Matter, Viña del Mar (Chile).
- 2019 **Active wetting and fingering of epithelial tissues.** StatPhys 27, Buenos Aires (Argentina).
- 2019 **Universal scaling in active nematic turbulence.** APS March Meeting, Boston, MA (USA).
- 2017 **Active wetting of epithelial tissues.** Cell Physics, Saarbrücken (Germany).
- 2017 **Bleb nucleation through membrane peeling.** Cell Physics, Saarbrücken (Germany).
- 2017 **Active wetting of epithelial tissues.** Engineering of Chemical Complexity, Vilanova i la Geltrú (Spain).
- 2016 **Fluidization and active thinning by molecular kinetics in active gels.** Biomimetic and living materials: Active matter at high densities, CECAM, Lausanne (Switzerland).
- 2016 **A new scenario in phase transitions: Inverting the energy landscape.** StatPhys 26, Lyon (France).
- 2016 **A new scenario in phase transitions: Inverting the energy landscape.** Emergent dynamics of out-of-equilibrium colloidal systems at nano- and microscales, CECAM, Lausanne (Switzerland).
- 2015 **Bleb nucleation through membrane peeling.** Cell Motility, Paris (France).
- 2015 **Bleb nucleation through membrane peeling.** IV complexitat.cat, Tarragona (Spain).
- 2014 **Magnetic colloids to study phase transitions.** JIPI, Barcelona (Spain).

Popular science talks

- 2023 **The physics of table tennis.** Retreat of the Condensed Matter Physics Department, Universitat de Barcelona, Terrassa (Spain). [Local TV news](#).
- 2016 **Physical principles in biology: From molecules to ecosystems.**
Colegio de España, Paris (France).
Grup C3, Calldetenes (Spain).
- 2015 **Phase transitions under the light of the microscope.**
Colegio de España, Paris (France).
Pint of Science, Barcelona (Spain).
- 2012 **The physics of table tennis.** Industrial Engineers Society of Catalonia, Barcelona (Spain).

Publications

* Equal contributions, ° Corresponding author

Preprints

- 43 H.A. Le, J. Hartmann, R. Alert, and R. Mayor°. Tissue flow acts as a guidance cue for immune cell polarisation and directional migration. Under review at *Nat. Cell Biol.*
- 42 K. Cavanaugh, MJ Franco-Oñate, D. Laird, P. Oakes, R. Alert, and O. Weiner°. [A mechanical origin for implantation defects in embryos from aged females.](#) bioRxiv:2025.09.29.679218 (2025).
- 41 H.L. Gertack, P.A.E. Hampshire, C. Wohlgemuth, R. Alert, and S. Aland°. [Modes of Mechanical Guidance of Adhesion-Independent Cell Migration.](#) arXiv:2509.11801 (2025). Under review at *Soft Matter*.
- 40 Y. Shi, R. Moessner, R. Alert*°, and M. Bukov*°. [General Hamiltonian description of nonreciprocal interactions.](#) arXiv:2505.05246 (2025). Under review at *Nat. Phys.*
- 39 D. Banerjee and R. Alert°. [Active Screws: Emergent Active Chiral Nematics of Spinning Self-Propelled Rods.](#) arXiv:2410.12263 (2024). Under review at *Phys. Rev. Lett.*
- 38 I. Lavi°, R. Alert, J-F. Joanny, and J. Casademunt. [Dynamical arrest in active nematic turbulence.](#) arXiv:2407.15149 (2024). Under review at *Phys. Rev. X*.

Published

- 37 M. Hillebrand and R. Alert°. [Discontinuous transition to active nematic turbulence.](#) arXiv:2501.06085 (2025). In press at *Nat. Commun.*
- 36 T. Welker and R. Alert°. [Lattice-dependent orientational order in active crystals.](#) *Soft Matter* **21**, 7228 (2025). Part of *Soft Matter Emerging Investigator Series*.
- 35 M. Black*, C. Fei*, R. Alert, N.S. Wingreen°, and J.W. Shaevitz°. [Capillary interactions drive the self-organization of bacterial colonies.](#) *Nat. Phys.* **21**, 1444 (2025).
- 34 I. Lavi°, R. Alert, J-F. Joanny, and J. Casademunt. [Nonlinear Spontaneous Flow Instability in Active Nematics.](#) *Phys. Rev. Lett.* **134**, 238301 (2025).
- 33 A. Shellard*, K. Weißenbruch*, P.A.E. Hampshire*, N.R. Stillman, C. Dix, R. Thorogate, A. Imbert, G. Charras, R. Alert°, and R. Mayor°. [Frictiotaxis underlies adhesion-independent durotaxis.](#) *Nat. Commun.* **16**, 3811 (2025).
- 32 E. Han°, C. Fei, R. Alert, K. Copenhagen, M.D. Koch, N.S. Wingreen, and J.W. Shaevitz°. [Local polar order controls mechanical stress and triggers layer formation in *Myxococcus xanthus* colonies.](#) *Nat. Commun.* **16**, 952 (2025).

- 31 R.G. Ramachandran, R. Alert[°], and P.A. Haas[°].
[Buckling by disordered growth.](#)
Phys. Rev. E **110**, 054405 (2024).
- 30 L. Rossetti[°], S. Grosser, L. Valon, J.F. Abenza, P. Roca-Cusachs, R. Alert[°], and X. Trepát[°].
[Optogenetic generation of leader cells reveals a force-velocity relation for collective cell migration.](#)
Nat. Phys. **20**, 1659 (2024).
- 29 S. Das, M. Ciarchi, Z. Zhou, J. Yan, J. Zhang[°], and R. Alert[°].
[Flocking by Turning Away.](#)
Phys. Rev. X **14**, 031008 (2024).
- 28 X. Trepát[°] and R. Alert[°].
[How to bridge the gap between theory and experiments in biological physics.](#)
Nat. Phys. **19**, 1738 (2023).
- 27 T. Brandstätter*, D. Brückner*, Y. L. Han, R. Alert, M. Guo, and C.P. Broedersz[°].
[Curvature induces active velocity waves in rotating spherical tissues.](#)
Nat. Commun. **14**, 1643 (2023).
- 26 M. Esteve Pallarès*, I. Pi-Jaumà*, I. Corina Fortunato, V. Grazú, M. Gómez-González, P. Roca-Cusachs, J. Martínez de la Fuente, R. Alert[°], R. Sunyer[°], J. Casademunt[°], and X. Trepát[°].
[Stiffness-dependent active wetting enables optimal collective cell durotaxis.](#)
Nat. Phys. **19**, 279 (2023).
- 25 M.A. Heinrich*, R. Alert*, A.E. Wolf*, A. Košmrlj[°], and D.J. Cohen[°].
[Self-assembly of tessellated tissue sheets by expansion and collision.](#)
Nat. Commun. **13**, 4026 (2022).
- 24 R. Alert[°].
[Fingering instability of active nematic droplets.](#)
J. Phys. A: Math. Theor. **55**, 234009 (2022). Special issue “*Emerging Talents 2021.*”
- 23 R. Alert[°], A. Martínez-Calvo, and S.S. Datta[°].
[Cellular Sensing Governs the Stability of Chemotactic Fronts.](#)
Phys. Rev. Lett. **128**, 148101 (2022).
- 22 R. Alert[°], J. Casademunt[°], and J-F. Joanny[°].
[Active Turbulence.](#)
Annu. Rev. Condens. Matter Phys. **13**, 143 (2022).
- 21 T. Bhattacharjee*, D.B. Amchin*, R. Alert*, J.A. Ott, and S.S. Datta[°].
[Chemotactic smoothing of collective migration.](#)
eLife **11**, e71226 (2022).
- 20 I. Pi-Jaumà, R. Alert, and J. Casademunt[°].
[Collective durotaxis of cohesive cell clusters on a stiffness gradient.](#)
Eur. Phys. J. E **45**, 7 (2022). Special issue “*Tissue Mechanics.*”
- 19 B. Martínez-Prat*, R. Alert*, F. Meng, J. Ignés-Mullol, J-F. Joanny, J. Casademunt, R. Golestanian[°], and F. Sagués.
[Scaling Regimes of Active Turbulence with External Dissipation.](#)
Phys. Rev. X **11**, 031065 (2021).
- 18 Q. Zhang, J. Li, J. Nijjer, H. Lu, M. Kothari, R. Alert, T. Cohen[°], and J. Yan[°].
[Morphogenesis and cell ordering in confined bacterial biofilms.](#)
Proc. Natl. Acad. Sci. USA **118**, e2107107118 (2021).

- 17 [R. Alert[°]](#) and X. Trepac[°].
[Living Cells on the Move.](#)
Phys. Today **74**(6), 30-36 (2021).
- 16 J. Zhang*, [R. Alert*](#), J. Yan, N.S. Wingreen, and S. Granick[°].
[Active phase separation by turning towards regions of higher density.](#)
Nat. Phys. **17**, 961 (2021).
- 15 K. Copenhagen*, [R. Alert^{*°}](#), N.S. Wingreen, and J.W. Shaevitz.
[Topological defects promote layer formation in *Myxococcus xanthus* colonies.](#)
Nat. Phys. **17**, 211 (2021).
- 14 M.A. Heinrich, [R. Alert](#), J.M. LaChance, T.J. Zajdel, A. Košmrlj, and D.J. Cohen[°].
[Size-dependent patterns of cell proliferation and migration in freely-expanding epithelia.](#)
eLife **9**, e58945 (2020).
- 13 [R. Alert](#), J-F. Joanny, and J. Casademunt[°].
[Universal scaling of active nematic turbulence.](#)
Nat. Phys. **16**, 682 (2020).
- 12 C. Fei, S. Mao, J. Yan, [R. Alert](#), H.A. Stone, B.L. Bassler, N.S. Wingreen[°], and A. Košmrlj[°].
[Non-uniform growth and surface friction determine bacterial biofilm morphology on soft substrates.](#)
Proc. Natl. Acad. Sci. USA **117**, 7622 (2020).
- 11 [R. Alert[°]](#) and X. Trepac[°].
[Physical Models of Collective Cell Migration.](#)
Annu. Rev. Condens. Matter Phys. **11**, 77 (2020).
- 10 [R. Alert[°]](#) and J. Casademunt[°].
[Role of Substrate Stiffness in Tissue Spreading: Wetting Transition and Tissue Durotaxis.](#)
Langmuir **35**, 7571 (2019). Special issue “*Interfaces and Biology I: Mechanobiology and Cryobiology.*”
- 9 [R. Alert[°]](#), C. Blanch-Mercader, and J. Casademunt.
[Active Fingering Instability in Tissue Spreading.](#)
Phys. Rev. Lett. **122**, 088104 (2019).
- 8 C. Pérez-González*, [R. Alert*](#), C. Blanch-Mercader, M. Gómez-González, T. Kolodziej, E. Bazellères, J. Casademunt[°], and X. Trepac[°].
[Active wetting of epithelial tissues.](#)
Nat. Phys. **15**, 79 (2019).
- 7 [R. Alert[°]](#), P. Tierno, and J. Casademunt.
[Mixed-order phase transition in a colloidal crystal.](#)
Proc. Natl. Acad. Sci. USA **114**, 12906 (2017).
- 6 D. Oriola^{*°}, [R. Alert^{*°}](#), and J. Casademunt.
[Fluidization and Active Thinning by Molecular Kinetics in Active Gels.](#)
Phys. Rev. Lett. **118**, 088002 (2017).
- 5 B. Smeets[°], [R. Alert](#), J. Pešek, I. Pagonabarraga, H. Ramon, and R. Vincent.
[Emergent structures and dynamics of cell colonies by contact inhibition of locomotion.](#)
Proc. Natl. Acad. Sci. USA **113**, 14621 (2016).
- 4 [R. Alert[°]](#), P. Tierno, and J. Casademunt[°].
[Formation of metastable phases by spinodal decomposition.](#)
Nat. Commun. **7**, 13067 (2016).
- 3 [R. Alert[°]](#) and J. Casademunt[°].
[Bleb Nucleation through Membrane Peeling.](#)
Phys. Rev. Lett. **116**, 068101 (2016).

- 2 [R. Alert](#), J. Casademunt, J. Brugués[°], and P. Sens[°].
[Model for Probing Membrane-Cortex Adhesion by Micropipette Aspiration and Fluctuation Spectroscopy.](#)
Biophys. J. **108**, 1878 (2015).
- 1 [R. Alert](#)[°], J. Casademunt, and P. Tierno[°].
[Landscape-Inversion Phase Transition in Dipolar Colloids: Tuning the Structure and Dynamics of 2D Crystals.](#)
Phys. Rev. Lett. **113**, 198301 (2014).