Tomás S. Grigera — Curriculum Vitae et Studiorum

Personal

Contact information	GRIGERA, Tomás Sebastián Instituto de Física de Líquidos y Sistemas Biológicos (IFLYSIB) ARGENTINA e-mail: tgrigera@iflysib.unlp.edu.ar
Born	1969 in La Plata, Argentina

Present positions

Since 1-Jun-24	Principal researcher of Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET). Instituto de Física de Líquidos y Sistemas Biológicos (IFLYSIB), CONICET and University of La Plata, Argentina.
From 1-Feb-22	Full Professor. Departamento de Física, Facultad de Ciencias Exactas, Universidad Nacional de La Plata.

Research interests

Active matter systems; collective motion; criticality in physical and biological systems; collective phenomena in biological systems and natural and artificial neural networks.

Prizes and awards

2010	Prize for young scientists, Fundación Bunge y Born, Buenos Aires, Argentina.

Education

11-Feb-1998	Ph.D. in Physics. University of La Plata, Argentina.
7-Dec-1993	M.Sc. in Physics. University of La Plata, Argentina. Recognized as equivalent (*equipollenza*) to the Italian *Laurea in Fisica* by *Sapienza* University of Rome (17-Apr-2002).

Research

1-Jun-24 –	Principal researcher CONICET, working at IFLYSIB, University of La Plata (Argentina).
1-Dec-15 – 31-May-24	Independent researcher CONICET, working at IFLYSIB, University of La Plata (Argentina).
12/19 – 6/20	Researcher (Assegnista de ricerca senior). Istituto Sistemi Complessi (ISC), Consiglio Nazionale delle Ricerche (CNR), Roma, Italia (sabbatical period).
23-Sep-19 – 4-Oct-19	Visiting Professor. Instituto de Física, Facultad de Ciencias, Universidad de la República (Montevideo, Uruguay).
1-Dec-15 –	Independent researcher CONICET, working at IFLYSIB, University of La Plata (Argentina).

1-Nov-10 – 30-Nov-14	Independent researcher CONICET, working at INIFTA, University of La Plata (Argentina).
7-Jan-08 – 5-Mar-08	Visiting Professor. Dipartimento di Fisica, Università degli studi di Trento (Italy).
2006 – 2011	Regular Associate, The Abdus Salam International Centre for Theoretical Physics (Trieste, Italy).
1-Nov-05 – 31-oct-10	Associate researcher CONICET, working at INIFTA, University of La Plata (Argentina).
1-Apr-04 – 31-Oct-05	Assistant researcher of CONICET, working at INIFTA, University of La Plata (Argentina).
1-Oct-03 – 31-Mar-04	Postdoctoral fellow of CONICET.
1-Mar-00 – 30-Sep-03	Postdoctoral fellow. Dipartimento di Fisica, Universitá di Roma *La Sapienza,* Rome, Italy.
1-Mar-98 – 28-Feb-00	Visiting Scholar / postdoctoral fellow. Department of Physics, Northeastearn University, Boston, USA.
1-Jul-97 – 31-Ago-97	Visiting Scholar. Department of Physics, Northeastern University, Boston, USA.
20-Jan-96 – 31-Mar-96	Visitor. Laboratoire d' Ultrasons et de Dynamique des Fluides Complexes, Université Louis Pasteur, Strasbourg, France.
1-Apr-94 – 28-Feb-98	Ph.D. student. Instituto de Investigaciones Fisicoquímicas Teóricas y Aplicadas (INIFTA), University of La Plata, Argentina. Advisor: Prof. Dr. Rubén V. Figini.
1-Feb-93 – 30-May-93	Student intern. Centro de Investigación, Fundación para el Desarrollo Tecnológico, Organización Techint, Campana, Argentina

Teaching

1-Feb-22 –	Full Professor. Departamento de Física, Facultad de Ciencias Exactas, Universidad Nacional de La Plata.
16-Dec-08 – 31-Jan-22	Assistant Professor. Departamento de Física, Facultad de Ciencias Exactas, Universidad Nacional de La Plata.
1-Aug-05 – 15-Dec-08	Assistant Professor (temporary). Freshman physics and statistical mechanics. Departamento de Física, Facultad de Ciencias Exactas, Universidad Nacional de La Plata.
26-Mar-04 – 28-Feb-06	Senior teaching assistant. Sphomore mathematics for engineers. Departamento de Fisicomatemáticas, Facultad de Ingeniería, Universidad Nacional de La Plata.
1-Apr-97 – 30-Set-03	Teaching assistant. Departamento de Física, Universidad Nacional de La Plata (on leave from 1-Mar-98).
1-Nov-94 – 18-Mar-97	Teaching assistant, freshman calculus. Departamento de Matemáticas, Universidad Nacional de La Plata.
18-May-94 – 20-Dic-94	Instructor, freshman calculus, Instituto del profesorado Juan N. Terrero, La Plata.

1-Dic-92 – 13-Mar-95	Teaching assistant, freshman physics. Departamento de Física, Universidad Nacional de La Plata.
15-Apr-91 – 28-Feb-93	Teaching assistant, freshman calculus for engineers. Departamento de Fisicomatemáticas, Facultad de Ingeniería, Universidad Nacional de La Plata.
01-Feb-91 – 28-Feb-91	Teaching assistant, freshman mathematics. Facultad de Ciencias Exactas, Universidad Nacional de La Plata.
23-Aug-90 – 31-Dic-90	Teaching assistant, sophomore physics. Departamento de Física, Universidad Nacional de La Plata.

Fellowships

1-Mar-00 – 30-Oct-00	Postdoctoral fellowship. Instituto Nazionale di Fisica Nucleare, Italy.
1-Apr-99 – 31-Mar-02	Postdoctoral fellowship. CONICET.
1-May-98 – 30-Apr-99	Postdoctoral fellowship. Fundación Antorchas, Argentina.
1-Apr-94 – 31-Mar-98	Graduate studies fellowship. Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina.
1-Mar-91 – 31-Dic-93	Undergraduate studies fellowship. Fundación Bolsa de Comercio de Buenos Aires.

Research grants received (as principal investigator)

March 2023	Research grand PIP2022/11220210100731CO (three years), from CONICET. ARS 3.500.000.
February 2022	Research grant PICT2020/00520 (three years), from Agencia Nacional para la Promoción de la Investigación, el Desarrollo Tecnológico y la Innovación. ARS 3.510.864.
January 2017	Research grant ERANet-LAC ELAC2015/T01-0593 (three years). International collaboration among four groups (La Plata, Montevideo, Rome, Ghent). PI of the La Plata group and consortium coordinator.
March 2016	Research grant PIP 2015/010089 (three years) from CONICET.
October 2013	Research grant PICT 2012/0206 (three years), from Agencia Nacional de Promoción Científica y Tecnológica. ARS 288.800.
January 2011	Research grant PIP0024 (three years) from CONICET (Argentina).
October 2008	Joint reasearch project within the Science and Technology Cooperation Agreement between Italy and Argentina. MinCyT (Argentina) and MAE (Italy). Italian coordinator: A. Cavagna.
December 2006	Young researcher grant from Agencia Nacional de Promoción Científica y Tecnológica (Argentina). 2 years.
July 2004	Reentry grant. Fundación Antorchas (Argentina). 1 year, renewed for an additional year August 2005.
November 2002	Grant “Enrico Fermi”. Centro di studi e ricerche “Enrico Fermi”, Roma (Italy). 1 year.

Invited lectures at short schools

1. Dynamics of structural glasses (20 hours). *Escuela IB-CAB de Dinámica fuera del equilibrio en sistemas complejos,* Instituto Balseiro (Bariloche, Argentina), 27 september to 24 October 2004.

2. Introduction to structural glasses (3 hours). *1st Latin American School on Statistical Mechanics of Complex Sytems,* La Habana (Cuba), 28 February to 9 march 2005.

3. Introduction to structural glasses (3 hours). *School on Modelling Elastic Manifolds (from Soft Condensed Matter to Biomolecules),* The Abdus Salam Centre for Theoretical Physics, Trieste (Italy), 24 and 25 July 2006.

4. Disordered systems and Monte Carlo simulations (1 hour). *2nd EULASUR summer school,* La Plata, 4 to 9 September 2011.

5. Liquids and disordered systems (20 hours). *Curso del TREFEMAC 2015,* (Los Reyunos, Mendoza, Argentina), 30 April to 5 may 2015 (together with Prof. M. Carlevaro).

6. Lectures on space and time correlations (4 hours). *Curso del XVIII Taller Regional de Física Estadística y Aplicaciones a la Materia Condensada (TREFEMAC 2021)*. Online, 5 July 2021.

7. Statistical physics for biology: collective motion (4.5 hours). *School on the Physics of Life,* ICTP-SAIFR, São Paulo (Brazil), 24 to 28 March 2025.

Invited talks at scientific meetings

1. Vibrations in glasses: a Random Matrix approach, *Unifying concepts in glass theory,* Accademia Nazionale dei Lincei, Roma, February 27–March 2, 2002.

2. La transición vítrea y las propiedades geométricas de la hipersuperficie de energía potencial, *II Taller Regional de Física Estadística y sus Aplicaciones a la Materia Condensada,* Córdoba, 27–28 May 2004.

3. Out of equilibrium dynamics of glassy systems. *Workshop on dynamics and relaxation in supercooled fluids and glassy sytems,* Mar del Plata, 26–29 September 2004.

4. Comparison of algorithms to search for saddle points, *1st Latin American Conference on Statistical Mechanics and Interdisciplinary Applications,* La Habana (Cuba), 10–12 March 2005.

5. Matrices aleatorias y modos normales de vidrios y líquidos sobreenfriados. *Encuentro de física computacional / I Reunión interdisciplinaria ventania.* Sierra de la Ventana (Argentina), 19 to 21 October 2005.

6. Mechanical instability of disordered structures and the glass transition, *Conference on Modelling Elastic Manifolds,* ICTP, Trieste (Italy), 26–29 July 2006.

7. Mosaic multi-state vs. one-state description of supercooled liquids, *Second Latin American Conference on Statistical Physics and Interdisciplinary Applications,* Bento Gonçalves (Brasil), 13–15 February 2007.

8. Invited in the role of discussant. *Workshop on dynamical heterogeneities in glasses, colloids and granular media,* Lorentz Center, Leiden (Netherlands), August 25–September 5 2008.

9. Thermodynamics of supercooled liquids: spatial correlations at low temperatures. *Fronteras en fisicoquímica, un enfoque interdisciplinario (conference on occasion of the 60th anniversary of INIFTA),* La Plata (Argentina), 24–28 November 2008.

10. Surface tension and spinodal limit in supercooled liquids. *International Discussion Meeting on Relaxation in Complex Systems.* Rome (Italy), August 30–September 5 2009.

11. Dynamic heterogeneities and phase separation in a supercooled liquid. *Humboldt Kolleg 2011.* La Plata (Argentina), March 2011.

12. Condiciones de contorno amorfas: una herramienta para el estudio de sistemas desordenados. *Reunión Nacional de Física del Estado Sólido (Sólidos 20119).* Tucumán (Argentina), 8 to 11 November 2011.

13. Dynamics of a model supercooled liquid confined in a cavity with amorphous boundary conditions. *Workshop on Structure and Dynamics of Glassy, Supercooled and Nanoconfined Fluids.* CAC-CNEA, Buenos Aires, 16 to 18 May 2012.

14. Order-agnostic lengthscales in supercooled liquids through amorphous boundary conditions. *CECAM Workshop on "From cooperativity in supercooled liquids to plasticity of amorphous solids".* ETH Zurich (Switzerland), 26 to 28 June 2013.

15. Condiciones de contorno amorfas y longitudes de correlación agnósticas en líquidos sobreenfriados. *XII Congreso regional de Física Estadística y aplicaciones a la materia condensada (TREFEMAC 2014).* Bahía Blanca (Argentina), 7 to 9 May 2014.

16. Correlaciones y criticalidad en el movimiento colectivo de estorninos y jejenes. *CII Reunión de la Asociación Física Argentina, sesiones de la División de Materia Blanda.* La Plata (Argentina), 26 to 29 September 2017.

17. Static and dynamic criticality in midge swarms. *Brain Criticality Virtual Meeting.* Online, 6 to 9 October 2020.

18. Dynamic crossover in homogeneous active matter. *34th M. Smoluchowski Symposium.* Online, 27 to 29 September 2021.

19. Transiciones de fase en sistemas desordenados (a propósito del Nobel a Giorgio Parisi). *106° Reunión de la Asociación Física Argentina,* online, 12 to 15 October 2021.

20. Towards a statistical physics theory of collective animal movement: the case of starling flocks. *Reunion de outuno de la Sociedade Brasileira de Fisica,* Ouro Preto (Brasil), 21 to 25 de May 2023.

21. Critical dynamics of natural swarms. *Brazilian Workshop on Soft Matter* São Paulo (Brasil), 4 to 6 October 2023.

22. Research on collective biological phenomena in the Statistical Biophysics group at IFLySiB. *Workshop on the Physics of Life.* ICTP-SAIFR, São Paulo (Brasil), 28 al 30 de marzo de 2025.

Languages

Spanish	Mother tongue.
English	• First Certificate in English, University of Cambridge Local Examinations Syndicate (december 1984)

	• Certificate of Proficiency in English. University of Cambridge Local Examinations Syndicate (december 1987).
German	Zertifikat Deutsch als Fremdsprache, Goethe-Institut Buenos Aires (december 1995).
Italian	Conversation, text comprehension, informal writing.
French	Basic conversation, technical text comprehension.

Advising

Masters thesis supervised

2012–2013	Alejandro Seif. MSc Physics, University of La Plata.
2019	Natalia G. Lavalle. MSc Physics, University of La Plata. (Co-supervisor, supervisor O. Chara).
2022–2023	Agustín Caputo Bugallo. MSc Physics, University of La Plata.
2022–2023	Christian Molina. MSc Physics, University of La Plata.
2022–2024	Melani Enrico. MSc Physics, University of Rosario.
2022–2025	Sol Elzegbe. MSc Biotechnology, University of La Plata.

Doctoral thesis supervised

2014–2017	Alejandro Seif. PhD Physics, University of La Plata.
2018–2022	Giulia Pisegna. PhD Physics *Sapienza* University of Rome. (Co-supervisor, supervisor A. Cavagna).
2022–2024	Ernesto Rotondo. PhD Physics, University of Buenos Aires. (Co-supervisor, supervisor A. Fendrik).
2020–2024	Alejo Costa. PhD Physics University of La Plata. (Co-supervisor, supervisor M. Sturla).
2020–2025	Natalia G. Lavalle. PhD Physics, University of La Plata.
2024–	Guido Cimino. PhD Physics, *Sapienza* University of Rome. (Co-supervisor, supervisor A. Cavagna). Expected 2027.
2024–	Christian Molina. PhD Physics, University of La Plata. Expected 2028.
2024–	Carla Soprano. PhD Physics, University of La Plata. Expected 2028.

Publications

Statistics:

- **Google scholar (12/2025):** 4246 total citations (1838 since 2020), h-index 28, i10-index 49.

Publications

[1] M. V. CERESSETTO, T. S. GRIGERA, B. O'DONNEL DE JUÁREZ ARÁOZ, J. SANDOVAL, AND M. GARAVAGLIA, Sobre el criterio de resolución de Rayleigh para fuentes policromáticas. *Anales de la Asoc. Fís. Arg.* **3**, 192–195 (1991).

[2] J. R. GRIGERA, T. S. GRIGERA, E. I. HOWARD, AND A. D. PODJARNY, Molecular Dynamics Simulation of Crystal Water with X-Ray Constraints. *Int. J. Quantum Chem.* **21** (1994).

[3] T. S. GRIGERA AND J. L. ALESSANDRINI, Elastic scattering from diblock copolymer chains in dilute solution. *J. Chem. Phys.* **104**, 6027–6035 (1996).

[4] S. A. GRIGERA, T. S. GRIGERA, AND J. R. GRIGERA, Random surface deposition of diffusing dimers in two dimensions. *Phys. Lett. A* **226**, 124–126 (1997).

[5] N. E. ISRAELOFF AND T. S. GRIGERA, Low-frequency dielectric fluctuations near the glass transition. *Europhys. Lett.* **43**, 308–313 (1998).

[6] T. S. GRIGERA AND N. E. ISRAELOFF, Observation of fluctuation-dissipation-theorem violations in a structural glass. *Phys. Rev. Lett.* **83**, 5038–5041 (1999).

[7] T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Vibrational Spectrum of Topologically Disordered Systems. *Phys. Rev. Lett.* **87**, 085502 (2001).

[8] T. S. GRIGERA AND G. PARISI, Fast Monte Carlo algorithm for supercooled soft spheres. *Phys. Rev. E* **63**, 045102 (2001).

[9] S. A. GRIGERA, T. S. GRIGERA, E. F. RIGHI, G. NIEVA, AND F. DE LA CRUZ, Flux-cutting in $YBa_2Cu_3O_{7-\delta}$ revisited. *Physica C: Superconductivity* **371**, 237–242 (2002).

[10] T. S. GRIGERA, A. CAVAGNA, I. GIARDINA, AND G. PARISI, Geometric Approach to the Dynamic Glass Transition. *Phys. Rev. Lett.* **88**, 055502 (2002).

[11] T. S. GRIGERA, I. M. IRURZUN, M. S. CORTIZO, R. V. FIGINI, AND M. MARX-FIGINI, Unified analysis of thermodynamic and rheological properties of high polymer solutions. I. Binary systems. *Journal of Polymer Science Part B: Polymer Physics* **40**, 290–301 (2002).

[12] T. S. GRIGERA AND N. E. ISRAELOFF, Numerical study of ageing in coupled two-level systems. *Philos. Mag. B* **82**, 313–322 (2002).

[13] T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Vibrational spectra in glasses. *Philos. Mag. B* **82**, 637–649 (2002).

[14] T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Vibrations in glasses and Euclidean random matrix theory. *J. Phys.: Condens. Matter* **14**, 2167 (2002).

[15] I. M. IRURZUN, T. S. GRIGERA, M. S. CORTIZO, R. V. FIGINI, AND M. MARX-FIGINI, Unified analysis of thermodynamic and rheological properties of high polymer solutions. II. Ternary systems. *J. Pol. Sci. B: Polym. Phys.* **40**, 1071–1079 (2002).

[16] A. CAVAGNA, I. GIARDINA, AND T. S. GRIGERA, Glass and polycrystal states in a lattice spin model. *J. Chem. Phys.* **118**, 6974 (2003).

[17] A. CAVAGNA, I. GIARDINA, AND T. S. GRIGERA, Glassy dynamics, metastability limit and crystal growth in a lattice spin model. *Europhys. Lett.* **61**, 74–80 (2003).

[18] A. CAVAGNA, I. GIARDINA, AND T. S. GRIGERA, A single saddle model for the β-relaxation in supercooled liquids. *J. Phys. A: Math. Gen.* **36**, 10721 (2003).

[19] S. CILIBERTI, T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Brillouin and boson peaks in glasses from vector Euclidean random matrix theory. *J. Chem. Phys.* **119**, 8577 (2003).

[20] T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Phonon interpretation of the 'boson peak' in supercooled liquids. *Nature* **422**, 289–292 (2003).

[21] S. CILIBERTI AND T. S. GRIGERA, Localization threshold of instantaneous normal modes from level-spacing statistics. *Phys. Rev. E* **70**, 061502 (2004).

[22] T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Asymptotic aging in structural glasses. *Phys. Rev. B* **70**, 014202 (2004).

[23] S. CILIBERTI, T. S. GRIGERA, V. MARTÍN-MAYOR, G. PARISI, AND P. VERROCCHIO, Anderson localization in Euclidean random matrices. *Phys. Rev. B* **71**, 153104 (2005).

[24] T. S. GRIGERA, Geometrical properties of the potential energy of the soft-sphere binary mixture. *J. Chem. Phys.* **124**, 064502 (2006).

[25] A. CAVAGNA, T. S. GRIGERA, AND P. VERROCCHIO, Mosaic Multistate Scenario Versus One-State Description of Supercooled Liquids. *Phys. Rev. Lett.* **98**, 187801 (2007).

[26] G. BIROLI, J.-P. BOUCHAUD, A. CAVAGNA, T. S. GRIGERA, AND P. VERROCCHIO, Thermodynamic signature of growing amorphous order in glass-forming liquids. *Nature Phys.* **4**, 771–775 (2008).

[27] C. CAMMAROTA, A. CAVAGNA, G. GRADENIGO, T. S. GRIGERA, AND P. VERROCCHIO, Evidence for a spinodal limit of amorphous excitations in glassy systems. *J. Stat. Mech.* **2009**, L12002 (2009).

[28] C. CAMMAROTA, A. CAVAGNA, G. GRADENIGO, T. S. GRIGERA, AND P. VERROCCHIO, Numerical determination of the exponents controlling the relationship between time, length, and temperature in glass-forming liquids. *J. Chem. Phys.* **131**, 194901 (2009).

[29] E. S. LOSCAR, E. E. FERRERO, T. S. GRIGERA, AND S. A. CANNAS, Nonequilibrium characterization of spinodal points using short time dynamics. *J. Chem. Phys.* **131**, 024120 (2009).

[30] C. CAMMAROTA, A. CAVAGNA, I. GIARDINA, G. GRADENIGO, T. S. GRIGERA, G. PARISI, AND P. VERROCCHIO, Phase-Separation Perspective on Dynamic Heterogeneities in Glass-Forming Liquids. *Phys. Rev. Lett.* **105**, 055703 (2010).

[31] A. CAVAGNA, T. S. GRIGERA, AND P. VERROCCHIO, Numerical simulations of liquids with amorphous boundary conditions. *J. Stat. Mech.* **2010**, P10001 (2010).

[32] G. GRADENIGO, A. SARRACINO, D. VILLAMAINA, T. S. GRIGERA, AND A. PUGLISI, The ratchet effect in an ageing glass. *J. Stat. Mech.* **2010**, L12002 (2010).

[33] E. V. ALBANO, M. A. BAB, G. BAGLIETTO, R. A. BORZI, T. S. GRIGERA, E. S. LOSCAR, D. E. RODRIGUEZ, M. L. R. PUZZO, AND G. P. SARACCO, Study of phase transitions from short-time non-equilibrium behaviour. *Rep. Progr. Phys.* **74**, 026501 (2011).

[34] T. S. GRIGERA, Glsim: A general library for numerical simulation. *Comp. Phys. Comm.* **182**, 2122–2131 (2011).

[35] T. S. GRIGERA, V. MARTIN-MAYOR, G. PARISI, P. URBANI, AND P. VERROCCHIO, On the high-density expansion for Euclidean random matrices. *J. Stat. Mech.* **2011**, P02015 (2011).

[36] A. CAVAGNA, T. S. GRIGERA, AND P. VERROCCHIO, Dynamic relaxation of a liquid cavity under amorphous boundary conditions. *J. Chem. Phys.* **136**, 204502 (2012).

[37] G. GRADENIGO, R. TROZZO, A. CAVAGNA, T. S. GRIGERA, AND P. VERROCCHIO, Static correlations functions and domain walls in glass-forming liquids: The case of a sandwich geometry. *J. Chem. Phys.* **138**, 12A509 (2013).

[38] A. ATTANASI, A. CAVAGNA, L. DEL CASTELLO, I. GIARDINA, T. S. GRIGERA, A. JELIĆ, S. MELILLO, L. PARISI, O. POHL, E. SHEN, AND M. VIALE, Information transfer and behavioural inertia in starling flocks. *Nature Phys.* **10**, 691–696 (2014).

[39] A. CAVAGNA, L. DEL CASTELLO, I. GIARDINA, T. S. GRIGERA, A. JELIC, S. MELILLO, T. MORA, L. PARISI, E. SILVESTRI, M. VIALE, AND A. M. WALCZAK, Flocking and Turning: A New Model for Self-organized Collective Motion. *J. Stat. Phys.* **158**, 601–627 (2014).

[40] A. CAVAGNA, I. GIARDINA, T. S. GRIGERA, A. JELIC, D. LEVINE, S. RAMASWAMY, AND M. VIALE, Silent Flocks: Constraints on Signal Propagation Across Biological Groups. *Phys. Rev. Lett.* **114**, 218101 (2015).

[41] S. A. GRIGERA, R. BORZI, D. G. SLOBINSKY, A. S. GIBBS, R. HIGASHINAKA, Y. MAENO, AND T. S. GRIGERA, An intermediate state between the kagome-ice and the fully polarized state in $Dy_2Ti_2O_7$. *Papers in Physics* **7**, 070009 (2015).

[42] D. A. MÁRTIN, A. CAVAGNA, AND T. S. GRIGERA, Specific Heat Anomaly in a Supercooled Liquid with Amorphous Boundary Conditions. *Phys. Rev. Lett.* **114**, 225901 (2015).

[43] A. SEIF, E. S. LOSCAR, AND T. S. GRIGERA, Aging and crystallization in a lattice glass model. *Phys. Rev. E* **91**, 042302 (2015).

[44] A. CAVAGNA, D. CONTI, I. GIARDINA, T. S. GRIGERA, S. MELILLO, AND M. VIALE, Spatio-temporal correlations in models of collective motion ruled by different dynamical laws. *Phys. Biol.* **13**, 065001 (2016).

[45] G. GRADENIGO, R. TROZZO, A. CAVAGNA, AND T. S. GRIGERA, Response to "Comment on 'Static correlations functions and domain walls in glass-forming liquids: The case of a sandwich geometry'" [J. Chem. Phys. 144, 227101 (2016)]. *The Journal of Chemical Physics* **144**, 227102 (2016).

[46] E. S. LOSCAR, C. G. FERRARA, AND T. S. GRIGERA, Spinodals and critical point using short-time dynamics for a simple model of liquid. *J. Chem. Phys.* **144**, 134501 (2016).

[47] A. CAVAGNA, D. CONTI, C. CREATO, L. DEL CASTELLO, I. GIARDINA, T. S. GRIGERA, S. MELILLO, L. PARISI, AND M. VIALE, Dynamic scaling in natural swarms. *Nature Phys.* **13**, 914–918 (2017).

[48] C. G. FERRARA AND T. S. GRIGERA, Dynamics and structural behavior of water in large confinement with planar amorphous walls. *The Journal of Chemical Physics* **147**, 024705 (2017).

[49] E. S. LOSCAR, D. A. MARTIN, AND T. S. GRIGERA, Stability limits for the supercooled liquid and superheated crystal of Lennard-Jones particles. *J. Chem. Phys.* **147**, 034504 (2017).

[50] A. CAVAGNA, D. CONTI, I. GIARDINA, AND T. S. GRIGERA, Propagating speed waves in flocks: A mathematical model. *Physical Review E* **98** (2018).

[51] A. CAVAGNA, I. GIARDINA, AND T. S. GRIGERA, The physics of flocking: Correlation as a compass from experiments to theory. *Physics Reports* **728**, 1–62 (2018).

[52] A. CAVAGNA, A. CULLA, L. DI CARLO, I. GIARDINA, AND T. S. GRIGERA, Low-temperature marginal ferromagnetism explains anomalous scale-free correlations in natural flocks. *Comptes Rendus Physique* **20**, 319–328 (2019).

[53] A. CAVAGNA, L. DI CARLO, I. GIARDINA, L. GRANDINETTI, T. S. GRIGERA, AND G. PISEGNA, Dynamical Renormalization Group Approach to the Collective Behavior of Swarms. *Phys. Rev. Lett.* **123**, 268001 (2019).

[54] A. CAVAGNA, L. DI CARLO, I. GIARDINA, L. GRANDINETTI, T. S. GRIGERA, AND G. PISEGNA, Renormalization group crossover in the critical dynamics of field theories with mode coupling terms. *Phys. Rev. E* **100**, 062130 (2019).

[55] D. A. MARTIN, T. S. GRIGERA, AND V. I. MARCONI, Speeding up the study of diluted dipolar systems. *Phys. Rev. E* **99**, 022604 (2019).

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