Carolina Trenado Yuste

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Employment and Research Experience

April 2023 – Present	**Damon Runyon Quantitative Biology Fellow**, at Princeton University in Celeste M. Nelson, Sujit S. Datta and Ned S. Wingreen laboratories.
Jun 2022 – April 2023	**NJCCR Postdoctoral Fellow**, at Princeton University in Celeste M. Nelson, Sujit S. Datta and Ned S. Wingreen laboratories.
Sep 2021 – Jun 2022	**Postdoctoral Researcher Associate**, at Princeton University in Celeste Nelson, Sujit Datta and Ned Wingreen laboratories.
Jan 2021 – Jun 2021	**Research Associate**, Mathematics Department, Universidad Carlos III de Madrid, Spain.
Feb 2017 – Jan 2021	**Ph.D candidate in Mathematical Engineering** , Mathematics Department, Universidad Carlos III de Madrid, Spain, Profs. Luis L. Bonilla and Ana Carpio. Qualification of Excellent "Cum Laude". PhD award date (January, 21, 2021).
July 8-26, 2019	**Research stay**: Boulder School for Condensed Matter and Materials Physics: Theoretical Biophysics.
March 2019 – Jun. 2019	**Research stay**: UC3M grant - 3 months at Courant Institute of Mathematical Sciences with Russel E. Caflisch, New York University.
April 2018 – May. 2018	**Research stay**: Funding for a long-term visit to the Focus Program on Nanoscale Systems and Coupled Phenomena at Fields Institute for Research in Mathematical Sciences.
Sept. 2015 – Feb. 2017	**M.Sc student and research assistant**, Department of Mathematics, Universidad Carlos III de Madrid, Prof. Luis L. Bonilla

Academic Backgronund

Feb. 2017 – Jan. 2021	**Ph.D. in Mathematical Engineering, Universidad Carlos III de Madrid** Thesis title: *Flocking and pattern formation in active particles and epithelial tissues.* Profs. Luis L. Bonilla and Ana Carpio.
Sept. 2015 – Feb. 2017	**M.Sc. Applied Mathematics, Universidad Carlos III de Madrid** Thesis title: *Collective motion of epithelial cells*. Prof. Javier Rodríguez Rodríguez and Prof. Luis L. Bonilla.
Sept. 2011 – Jul. 2015	**B.Sc. Mathematics, Universidad de Salamanca, Spain** Thesis title: *Hamiltonian Dynamical systems and Momentum map geometry*. Prof. Antonio Lopez Almorox.
Sept. 2005 – Jul. 2011	**Professional Grade of music**, (violin) awarded by Professional Conservatory of music of Salamanca.

Fellowships

April 2023 – Present	**Damon Runyon Quantitative Biology Fellow**, at Princeton University in Celeste M. Nelson, Sujit S. Datta and Ned S. Wingreen laboratories.
Jun. 2022-2024	**NJCCR Postdoctoral Fellowship Grant 2023**.

Fellowships (continued)

June 2021 — **PONTE Postdoctoral Program in Theoretical Quantitative Biology (Declined)**.

Feb. 2017-2021 — **Universidad Carlos III PhD internal fellowship**, Spain.

April 2018-May. 2018 — **Research-stay fellowship under the Fields Institute program**, Destination: Fields Institute, Toronto.

March 2019-Jun. 2019 — **Research-stay fellowship under the competitive UC3M program**. Destination: Russel E.Caflisch, Courant Institute, New York.

Awards

2023
- **Poster Award** at the PCTS workshop on Biophysics of Organoids.
- **Presentation Award** at the 2023 Complex Active and Adaptive Material Systems Gordon Research Seminar.
- **Block Award** to promising young physicist at Aspen Center for Physics.

2022
- **DSOFT Future Investigator Travel (FIT) Award.**

2021
- **Universidad Carlos III de Madrid Extraordinary Doctoral Award** for the academic year 2021-2022 for the thesis entitled "Flocking and pattern formation in active particles and epithelial tissues"

2019
- **Excellence in Teaching**, Universidad Carlos III de Madrid, Spain.

2018
- **Excellence in Teaching**, Universidad Carlos III de Madrid, Spain.

Publications

Journal Articles

1. Martínez-Calvo, A., **Trenado-Yuste**, **C.**, & Datta, S. S. (2023). Book chapter in out-of-equilibrium soft matter: Active fluids. *Royal Society of Chemistry. Free access on arXiv:* https://arxiv.org/pdf/2108.07011.pdf

2. Martínez-Calvo, A., **Trenado-Yuste**, **C.**, Lee, H., Wingreen, N., & Datta, S. S. (2023). Morphological instability of competing growing bacterial colonies. *In preparation*.

3. Paramore, S. V., **Trenado-Yuste**, **C.**, Sharan, R., Davenport, D., & Nelson, C. M. (2023). Celsr1-independent mesenchymal vangl facilitates epithelial expansion during sacculation. *Under Review*. https://doi.org/https://doi.org/10.1101/2022.12.28.522148

4. Porter, R., **Trenado-Yuste**, **C.**, Martínez-Calvo, A., Wingreen, N., Datta, S. S., & Huang, K. C. (2023). Review on the physics of bacterial colonies. *Nature Reviews Physics. In preparation.*

5. **Trenado-Yuste**, **C.**, Banavar P., S., & Nelson, C. M. (2023). The effects of cell-cell cooperation in 3d breast cancer spheroids. in preparation. *In preparation*.

6. **Trenado-Yuste**, **C.**, Marquina, A., & Bonilla, L. L. (2021). Bifurcation theory captures band formation in the vicsek model of flock formation. *Under Review*. https://arxiv.org/pdf/2203.14238.pdf

7. **Trenado-Yuste**, **C.**, Bonilla, L. L., & Martinez-Calvo, A. (2021). Fingering instability in spreading epithelial monolayers: Roles of cell polarisation, substrate friction and contractile stresses. *Soft Matter, 2021, 17, 8276-8290.* https://doi.org/10.1039/D1SM00626F

8. Bonilla, L. L., Carpio, A., & **Trenado-Yuste**, **C.** (2020). Tracking collective cell motion by topological data analysis. *PLOS Computational Biology 16 (12), e1008407.* https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1008407

9. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2019b). Contrarian compulsions produce exotic time-dependent flocking of active particles. *Physical Review E, 99, 1, 012612, American Physical Society*. https://doi.org/10.1103/PhysRevE.99.012612

10. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2018a). Crossover between parabolic and hyperbolic scaling, oscillatory modes and resonances near flocking. *Physical Review E, 98, 6, 062603, American Physical Society*. https://doi.org/10.1103/PhysRevE.98.062603

Conference Contribution

1. **Trenado-Yuste**, **C.**, & Nelson, C. M. (2022). Poster: The effects of cell-cell cooperation in 3d breast cancer spheroids, 2022 Summer Biomechanics, Bioengineering, Biotransport Conference (SB3C2022), Maryland.

2. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2019a). Crossover between parabolic and hyperbolic scaling, oscillatory modes and resonances near flocking, Bulletin of the American Physical Society. March meeting of the APS, Boston.

3. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2018b). Contrarian compulsions produce exotic time dependent flocking of active particles, Red de Física Estadística de No Equilibrio, Barcelona, Spain.

4. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2018c). Poster: Contrarian compulses produce time dependent flocking of active particles, Physics, Biological Systems 2018, Gif-sur-Yvette, France.

5. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2018d). Collective cell motion in epithelial surfaces, In *Focus program on nanoscale systems and coupled phenomena: Mathematical analysis, modeling, and application.* Fields Institute, Toronto, Canada.

6. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2018e). Contrarian impulses produce time dependent flocking of active particles, In *Focus program on nanoscale systems and coupled phenomena: Mathematical analysis, modeling, and application.* Fields Institute, Toronto, Canada.

7. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2018f). Time periodic flocking phenomena, Bulletin of the American Physical Society. March meeting of the APS, Los Angeles.

8. Bonilla, L. L., & **Trenado-Yuste**, **C.** (2017). Poster: Collective cell motion in epithelial surfaces, In *Challenges in nonlinear systems: A meeting to celebrate the 60th birthday of prof. l.l. bonilla*, Madrid.

Teaching

2021/2022 — **An Integrated, Quantitative Introduction to the Natural Sciences II** (Precepts), Princeton University.

2020/2021 — **Linear Algebra** (Problem sessions), UC3M (13870).

2019/2020 — **Discrete Mathematics** (Problem sessions), UC3M (15971).

2018/2019 — **Linear Algebra** (Problem sessions), UC3M (13870).

2017/2018 — **Discrete Mathematics** (Problem sessions), UC3M (15971).