Carles Falcó

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🌐 carlesfalco　•　💼 Carles Falco

Education

University of Oxford, St. John's College　　　　　　　**Oxford, United Kingdom**
　DPhil Mathematics, *Interactions and dynamics in collective cell behaviour*　　*2021 – 2025 (expected)*
　Supervisors: Prof. Ruth E. Baker, Prof. José A. Carrillo

Universitat Autònoma de Barcelona　　　　　　　　　　**Barcelona, Spain**
　BSc Mathematics (GPA: 9.56/10) & BSc Physics (GPA: 9.50/10)　　　　　*2016 – 2021*

University of California, Santa Barbara　　　　　**Santa Barbara, California**
　BSc Physics and Mathematics (GPA: 4.0/4.0)　　　　　　　　　　　　*2018–2019*
　Education Abroad Program (UCEAP)

Core Skills

- **Programming and Scientific Computing:** Python (including NumPy, SciPy, Numba), C (intermediate). Experience in implementing numerical methods for the solution of complex mathematical models and in the analysis of noisy biological data.
- Mathematical Modelling: ordinary, stochastic, and partial differential equations
- Parameter Estimation: expertise with Bayesian inference (pyPESTO, PINTS), and likelihood-free methods.

Journal articles

10. **C. Falcó**, D. J. Cohen, J. A. Carrillo & R. E. Baker (2024). Quantifying cell cycle regulation by tissue crowding. To appear in *Biophys. J.*

9. J. A. Carrillo, A. Esposito, **C. Falcó**[†] & A. Fernández-Jiménez (2024). Competing effects in fourth-order aggregation-diffusion equations. *Proc. London Math. Soc.*, 129, e12623.

8. **C. Falcó**, R. M. Crossley & R. E. Baker (2024). Travelling waves in a minimal go-or-grow model of cell invasion. *Appl. Math. Lett.*, 158, 109209.

7. **C. Falcó**, R. E. Baker & J. A. Carrillo (2024). A local continuum model of cell-cell adhesion. *SIAM J. Appl. Math.*, 84, S17-S42.

6. A. P. Browning, M. Tasca, **C. Falcó**, & R. E. Baker (2024). Structural identifiability for linear diffusion-advection-reaction processes in mathematical biology. *Proc. R. Soc. A*, 480:20230911.

5. **C. Falcó**, D. J. Cohen, J. A. Carrillo & R. E. Baker (2023). Quantifying tissue growth, shape and collision via continuum models and Bayesian inference. *J. R. Soc. Interface*, 20:20230184.

4. D. Buoso, **C. Falcó**[†], M. González & M. Miranda (2023). Bulk-boundary eigenvalues for bilaplacian problems. *Disc. Continuous Dyn. Syst. A*, 43, 1175-1200.

3. **C. Falcó** (2022). From random walks on networks to nonlinear diffusion. *Phys. Rev. E*, 106:054103.

2. **C. Falcó** & Á. Corral (2022). Finite-time scaling for epidemic processes with power-law superspreading events. *Phys. Rev. E*, 105:064122.

1. **C. Falcó** & H. V. Moeller, (2022). Optimal spatial management in a multiuse marine habitat: Balancing fisheries and tourism. *Natural Resource Modeling*, 35, e12309.

Scholarships, Awards and honors

ESMTB Travel Grant
European Society for Mathematical and Theoretical Biology　　　　　　　　*2024*
Travel grant to attend ECMTB 2024.

North Senior Scholarship
St John's College　　　　　　　　　　　　　　　　　　　　　　　*2023-2024*
Awarded to four graduate students every year in all subjects, based on excellence in research.

[†]authors listed alphabetically

SIAM Student Travel Award

Society for Industrial and Applied Mathematics *2023*

Travel grant to attend SIAM DS23.

Landahl Award

Society for Mathematical Biology *2022*

Travel grant to attend SMB-ECMTB 2022.

Mathematical Institute Scholarship

Mathematical Institute, Oxford *2023-2025*

Four year funding offer including tuition fees and stipend.

Postgraduate Fellowships Abroad

Fundació "La Caixa" *2021-2023*

Funding for the two first years of my DPhil at Oxford including tuition fees and stipend.

Collaboration Fellowship for Spanish Undergraduates

Spanish Education Ministry *2020*

Funding for one academic year in the Physics UAB department working on my Physics Bachelor's thesis

Grant program Severo Ochoa – Introduction to Research 2020

ICMAT, Madrid (online) *2020*

Summer internship at ICMAT Madrid. Worked under the supervision of Prof. María del Mar González.

ISTernship program

IST Austria *2019*

Summer research internship at IST Austria. Worked under the supervision of Prof. Edouard Hannezo.

Research visits

○ Research visit to Prof. Jennifer Flegg at University of Melbourne, Sep 9-13, 2024.

○ Research visit to Prof. María del Mar González at Universidad Autónoma de Madrid - ICMAT, Mar 13-17, 2023.

○ Research stay in the group of Prof. Jan Hasenauer at University of Bonn as part of the Programme: *Stochastic modelling in the life science: From evolution to medicine*, Jun 1 - Aug 10, 2022.

Talks and scientific presentations

○ Talk by invitation at the MATRIX Workshop: Parameter Identifiability in Mathematical Biology, Creswick, Australia, Sep 20, 2024.

○ Talk by invitation at the Melbourne Mathematical Biology seminar, Melbourne, Australia, Sep 10, 2024.

○ Talk by invitation at the minisymposium – KSMB-SMB 24, Seoul, Jun 30 - Jul 5, 2024 (online due to injury).

○ Talk by invitation at the conference: The Cahn-Hilliard equation - recent advances and new challenges, Chęciny, Apr 21-26, 2024.

○ Seminar by invitation at Junior Analysis Seminar, Imperial College London, Oct 4, 2023.

○ Talk by invitation at the workshop Measures and Representations of Interactions – Newton Institute Programme Mathematics of movement, Cambridge, Sep 11-15, 2023.

○ Poster at the workshop Topics in Neuroscience, Collective Migration and Parameter Estimation, Oxford, July 3-7, 2023.

○ Talk by invitation at minisymposium – SIAM DS23, Portland, May 14-18, 2023.

○ Talk by invitation at minisymposium – BAMC, Bristol, Apr 3-5, 2023.

○ Seminar by invitation at UAM-ICMAT PDE seminar, ICMAT, Madrid, Mar 16, 2023.

○ Talk by invitation at minisymposium – SIAM CSE23, Amsterdam, Feb 26 - Mar 3, 2023.

○ Online seminar by invitation at StAMBio seminar, University of St Andrews, Dec 5, 2022.

○ Talk by invitation at minisymposium – SMB-ECMTB 2022, Universität Heidelberg, Sep 19-23, 2022.

○ Lightning talk at SIAM Workshop on Network Science (NS22) (online), Sep 13-15, 2022.

○ Contributed talk at BIFI International Conference: The science of COVID-19 (online), Jun 7-9, 2022.

○ Poster at XXIII Congreso de Física Estadística, Universidad de Zaragoza, May 12-14, 2022.

○ Talk at Young Researchers Workshop on PDEs and Probability, Univ. de Granada, May 3-6, 2022.

○ Online seminar by invitation at Non-equilibrium systems group seminar, Imperial College London, Jan 14, 2022.

Reviewer for scientific journals

Physical Review E, Bulletin of Mathematical Biology, Royal Society Open Science, Studies in Applied Mathematics

Teaching

University of Oxford   **Oxford, United Kingdom**

St Hugh's College, Stipendiary Lecturer in Mathematics   *2022-present*
- Teaching tutorials to second year undergraduate students in Mathematics. Courses include: Special Relativity, Calculus of Variations, Mathematical Modelling in Biology, Quantum Theory, Metric Spaces and Complex Analysis, Integral Transforms, Differential Equations, Linear Algebra, Probability.

St Johns's College & Wadham College   *2022-2024*
- Tutor for ASO Mathematical Modelling in Biology

Mathematical Institute   *2021-2022*
- Teaching Assistant for B5.5 Further Mathematical Biology
- Teaching Assistant for C5.4 Networks

UC Santa Barbara   **Santa Barbara, California**
Department of Physics   *2019*
- Learning Assistant for Physics 1: Basic Physics, Classical Mechanics (Spring term 2019).