CARLES FALCÓ

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EDUCATION

University of Oxford, St. John's College   **Oxford, United Kingdom**
DPhil Mathematics   *2021 – 2025 (expected)*
- **Supervisors:** Prof. Ruth Baker, Prof. José A. Carrillo

Universitat Autònoma de Barcelona   **Barcelona, Spain**
BSc Mathematics   *2016 – 2021*
- **GPA** 9.56/10

Universitat Autònoma de Barcelona   **Barcelona, Spain**
BSc Physics   *2016 – 2021*
- **GPA** 9.50/10

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

JOURNAL ARTICLES

6. **C. Falcó**, D. 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.

5. **C. Falcó**, R. E. Baker & J. A. Carrillo (2023). A local continuum model of cell-cell adhesion. To appear in *SIAM J. Appl. Math.*.

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.

PREPRINTS

2. J.A. Carrillo, A. Esposito, **C. Falcó**[†] & A. Fernández-Jiménez. Competing effects in fourth-order aggregation-diffusion equations (arXiv preprint).

1. A.P. Browning, M. Tasca, **C. Falcó**, & R. E. Baker. Structural identifiability for linear diffusion-advection-reaction processes in mathematical biology (arxiv preprint).

TALKS AND SCIENTIFIC PRESENTATIONS

- **Dynamics of growth, collision, and cell division in epithelial monolayers,**
  - talk at the workshop *Measures and Representations of Interactions* – Newton Institute Programme Mathematics of movement, Cambridge, Sep 11-15, 2023.

- **Quantifying tissue growth, shape and collision via continuum models and Bayesian inference,**

[†]authors listed alphabetically

- poster at the workshop Topics in Neuroscience, Collective Migration and Parameter Estimation Oxford, July 3-7, 2023.
- talk at the minisymposium *Exploring Complexity in Life Sciences with Modeling and Simulations* — SIAM Conference on Computational Science and Engineering, Amsterdam, Feb 27 - Mar 3, 2023.

○ **Nonlocal models of cell-cell adhesion and their Cahn-Hilliard approximation,**
- seminar by invitation at Junior Analysis Seminar, Imperial College London, London, Oct 4, 2023;
- talk at the minisymposium *Modeling and Data-Driven Methods for Collective Behavior and Pattern Formation* — SIAM Conference on Applications of Dynamical Systems, Portland, May 14-18, 2023.
- talk at the minisymposium *Dynamics of Reaction-Transport Systems* — British Applied Mathematics Colloquium, Bristol, Apr 3-5, 2023.
- seminar by invitation at PDEs UAM-ICMAT seminar, ICMAT, Madrid, Mar 16, 2023;
- online seminar by invitation at StAMBio seminar, University of St Andrews, Dec 5, 2022;
- talk at the minisymposium *Nonlocal models in Mathematical Biology* — European Conference on Mathematical and Theoretical Biology 2022, Universität Heidelberg, Sep 19-23, 2022;
- talk at Young Researchers Workshop on PDEs and Probability, Universidad de Granada, May 3-6, 2022.

○ **From random walks on networks to nonlinear diffusion,**
- lightning talk at SIAM Workshop on Network Science (NS22), (online), Sep 13-15, 2022.

○ **Finite-time scaling for epidemic processes with power-law superspreading events,**
- contributed talk at BIFI International Conference: The science of COVID-19, Universidad de Zaragoza (online), Jun 7-9, 2022;
- poster at XXIII Congreso de Física Estadística (FisEs22), Universidad de Zaragoza, May 12-14, 2022;
- online seminar by invitation at Non-equilibrium systems group seminar, Imperial College London, Jan 14, 2022.

RESEARCH GRANTS

Hausdorff Research Institute for Mathematics
University of Bonn   *June 2022 - August 2022*
Fellowship to participate in the Junior Trimester Program: *Stochastic modelling in the life science: From evolution to medicine.* Research stay in the group of Prof. Jan Hasenauer.

REVIEWER FOR SCIENTIFIC JOURNALS

○ Physical Review E
○ Royal Society Open Science

TEACHING

University of Oxford   **Oxford, United Kingdom**
St Johns's College & Wadham College   *2022-2023*
○ Tutor for ASO Mathematical Modelling in Biology (Trinity 2023)
St Hugh's College, Stipendiary Lecturer in Mathematics   *2022-2023*

- A2 Metric Spaces and Complex Analysis (Michaelmas 2023)
- ASO Integral Transforms (Hilary 2022)
- A6 Differential Equations 2 (Hilary 2022)
- A0 Linear Algebra (Michaelmas 2022)
- A8 Probability (Michaelmas 2022)

Mathematical Institute   *2021-2022*
- TA for B5.5 Further Mathematical Biology (Michaelmas 2021).
- TA for C5.4 Networks (Hilary 2022).

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

Scholarships, Awards and honors

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

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 ECMTB22.

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 PhD 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 Dr. María del Mar González.

ISTernship program
IST Austria   *2019*
Summer research internship at IST Austria. Worked under the supervision of Dr. Edouard Hannezo.

Outreach and media coverage

1. C. Falcó (2023). Matemáticas para explicar cómo se unen las células. Café y Teoremas, El País. [online access]
2. C. Falcó (2023). Quantifying tissue growth, shape, and collision in epithelial monolayers. SIAM News. [online access]

Additional relevant experience

Fundació Catalunya La Pedrera   **Barcelona, Spain**
Barcelona International Youth Science Challenge (BIYSC)   *2021*
- Staff member for the BIYSC 2021, a two-week international science programme for high school students (16 to 18).