ANDREI MICHEL SONTAG

andreisontag@gmail.com 0000-0002-7088-0491 07311895831 London, UK

WORK EXPERIENCE

co-Lecturer Oct 2025
Dept. of Mathematics, University College London.
Co-lead the course *Mathematical Biology* for PhD students at the London Taught Course Centre for students in mathematical sciences.

Research Fellow Sep 2024 – Present
Dept. of Mathematics, University College London.
Project: Understanding Antimicrobial Resistance evolution in heterogeneous environments.
Principal Investigator: Dr. Philip Pearce.
Collaborators: Dr. Chris Knight, Dr. Rok Krašovec, Dr. Kabir Husain.

Visiting Research Assistant Jan 2024 – Feb 2024
Centre for Advanced Systems Understanding (CASUS) – Görlitz, Germany.
Project: Eco-evolutionary feedbacks on perceptual ranges and stochastic pattern formation.
Collaborator: Ricardo Martínez-Garcia.

Graduate Teaching Assistant Sep 2021 – Sep 2023
Dept. of Mathematical Sciences, University of Bath.
Tutor of second-year undergraduate courses titled **Modelling and dynamical systems** and **Ordinary Differential Equations & Control Theory**.

EDUCATION

PhD in Statistical Applied Mathematics 2021 - 2024
Dept. of Mathematical Sciences, University of Bath / SAMBa CDT (EPSRC funded).
Thesis Title: Information propagation and collective decision-making in biology
Supervisors: Prof. Tim Rogers and Prof. Kit Yates

Master of Research in Statistical Applied Mathematics – Distinction 2020 - 2021
Dept. of Mathematical Sciences, University of Bath / SAMBa CDT (EPSRC funded).
Thesis Title: Exploring information spread and stochastic systems in biology
Supervisors: Prof. Tim Rogers and Prof. Kit Yates

Master of Science in Theoretical Physics – Grade: A (excellent) 2018 - 2020
Institute for Theoretical Physics, UNESP (São Paulo State University). Funded by CAPES.
Thesis Title: Time Periodic Growth in Population Dynamics
Supervisors: Prof. Roberto A. Kraenkel and Prof. Renato Coutinho

Bachelor of Science in Physics – Average mark: 8.6/10 2014 - 2017
Institute of Physics, USP (University of São Paulo).

PUBLICATIONS

Published:

1. Sontag, A., Rogers, T. and Yates, C. A.. 2023. Dynamics of information networks. *J. App. Prob.*. 2023:1-11. https://doi.org/10.1017/jpr.2023.91
2. Sontag, A., Rogers, T. and Yates, C. A.. 2023. Stochastic drift in discrete waves of non-locally interacting-particles. *Phys. Rev. E* 107, 014128. https://doi.org/10.1103/PhysRevE.107.014128
3. Sontag, A., Rogers, T. and Yates, C. A.. 2022. Misinformation can prevent the suppression of epidemics. *J. R. Soc. Interface*.1920210668. 20210668. http://doi.org/10.1098/rsif.2021.0668

In preparation:

4. Sontag, A., Hoffmann, J., Rogers, T., Yates, C. A.. *(Under review)* Consensus formation and change are enhanced by neutrality.

5. Sontag, A., Martinez-Garcia, R. *(In preparation)* Eco-evolutionary feedbacks on perceptual ranges and stochastic pattern formation.

LANGUAGES/SKILLS

Computer Languages/Software: Python, oTree, MATLAB, **C++**, R, Mathematica and Latex. Limited experience with CSS, HTML and server setup.
High Performance Computing (HPC) systems at the University of Bath, CASUS and UCL.
Python Data Associate and **Data Scientist Associate** certifications from DataCamp. Including supervised and unsupervised ML, and data dimension-reduction methods.
Data: Experience analysing animal tracking data, and designing/collecting voting-game data for my research.
Languages: Portuguese (Native), English (Fluent), Spanish (Intermediate).

SUPERVISION EXPERIENCE

Co-supervised a MMaths project. My role was to provide advice in research directions and help the student with technical support, coding, revision. 2021 – 2022

ACADEMIC POSITIONS OF RESPONSIBILITY

Organiser of the Centre for Mathematical Biology Seminars at the University of Bath. 2022 – 2024
Co-organiser of the ICTP-SAIFR Complex Systems and Statistical Mechanics Seminars. 2020

SELECTED TALKS, CONFERENCES AND RESEARCH VISITS

Research Visits:

1. **Visit to Center for Advanced Systems Understanding (CASUS) / Helmholtz-Zentrum Dresden-Rossendorf (HZDR)** – Görlitz, Germany, 2024.

   In this two-month visit, I worked closely with Ricardo Martinez-Garcia. The visit created research collaborations between the University of Bath and CASUS. The research project aimed to understand the eco-evolutionary effects of individuals' perception range variability on pattern formation.

Talks and posters:

2. **Alma Dal Co School on Collective Behaviour** – Istituto Veneto di Scienze Lettere ed Arti, Venice, IT, 2025. Poster: "Consensus formation and change are enhanced by neutrality".

3. **British Mathematical Colloquim and British Applied Mathematics Colloquium (BMC-BAMC 2025)** – Univ. of Exeter, Exeter, UK, 2025. Talk: "Pathways for overturning consensus in human collective decision-making".

4. **13th European Conference on Mathematical and Theoretical Biology (ECMTB 2024)** – Univ. of Castilla-La Mancha, Toledo, Spain, 2024. Talk: "Pathways for overturning consensus in human collective decision-making".

5. **Mathematical Models in Ecology and Evolution (MMEE 2024)** – Univ. of Vienna, Vienna, Austria, 2024. Talk: "Emergence of multiscale patterns from population diversity of interaction ranges".

6. **CASUS In-depth SciTalks** – CASUS/HZDR, Görlitz, Germany, 2024. Talk: "Pathways for overturning consensus in human collective decision-making".

7. **Summer School on Mathematics of Movement** – Isaac Newton Institute, University of Cambridge, UK, 2023. Talk: "Slow convergence of stochastic models for group navigation and cohesion maintained by non-local interactions".
8. **64th British Applied Mathematics Colloquium (BAMC)** – Univ. of Bristol/UWE, Bristol, UK, 2023. Talk: "Stochastic drift in discrete waves of nonlocally interacting particles".
9. **7th SAMBa Summer Conference** – University of Bath, UK, 2023. Talk: "Stochastic drift in discrete waves of nonlocally interacting particles".
10. **6th SAMBa Summer Conference** – University of Bath, UK, 2022. Talk: "Misinformation can prevent the suppression of epidemics".
11. **12th European Conference on Mathematical and Theoretical Biology (ECMTB 2022)** – Heidelberg, Germany, 2022. Poster: "Misinformation can prevent the suppression of epidemics".

Invited conferences:

12. **Modelling to Support Resilience for Pandemics – Open Questions** – Newton Gateway to Mathematics, University of Cambridge, UK, 2022.
13. **Behaviour and Policy During Pandemics: Models and Methods** – Newton Gateway to Mathematics, University of Cambridge, UK, 2022.

    These two conferences gathered invited researchers to discuss lessons learned during the COVID-19 pandemic and ways that science can help planning resilience and to prevent future pandemics by aiding policymaking.

SCHOLARSHIPS/AWARDS

1. Grant of £5000 from the University of Bath Alumni Fund. 2024–2025
2. Grant of £5000 from the Bath IMI Small Grants Scheme for Mathematical Sciences. 2023–2024
3. ESPRC SAMBa Integrated PhD 2020–2024

ACADEMIC REFERENCES

Dr. Philip Pearce Postdoc PI. (email: philip.pearce@ucl.ac.uk)
Associate Professor. Dept. of Mathematics, University College London, UK

Prof. Kit Yates PhD Supervisor. (email: c.yates@bath.ac.uk)
Professor of Mathematical Biology and Public Engagement. Dept. of Mathematical Sci., University of Bath, UK