Linnéa Gyllingberg

Fulbright Scholar and Wallenberg Postdoctoral Fellow, Department of Mathematics, UCLA

+1 310 904 2761 — linnea@math.ucla.edu — linneagyllingberg.github.io

Summary

I am an interdisciplinary researcher and applied mathematician with a strong interest in using mathematics to understand biological intelligence. My research focuses on developing and analysing mathematical models for biological applications, using dynamical systems, network models, and agent-based modelling. I am particularly interested in how oscillatory dynamics in adaptive networks contribute to learning and decision-making in non-neural systems.

Academic Positions

- **2024–2026**: Fulbright Scholar & Knut and Alice Wallenberg Postdoctoral Fellow, Department of Mathematics, University of California, Los Angeles, USA.
- **Autumn 2024**: Research Fellow, "Mathematics of Intelligence" Program, Institute of Pure and Applied Mathematics, University of California, Los Angeles, USA.
- **2016–2024**: Ph.D. Student, Department of Mathematics, Uppsala University, Sweden. *Parental leave (October 2019–December 2020, October 2021–August 2022) during PhD studies.*
- **Autumn 2018**: Graduate Fellow, "Mathematical Biology" Program, Mittag-Leffler Institute, Stockholm, Sweden.
- **Spring 2017**: Visiting Ph.D. Student, Department of Mathematics, Imperial College London, UK.
- **2013–2016**: Teaching Assistant, Department of Mathematics, Uppsala University, Sweden.

Education

- **2016-2024**: Doctorate of Philosophy in Applied Mathematics and Statistics, Uppsala University, Sweden. *Thesis: "The Art of Modelling Oscillations and Feedback across Biological Scales"*
- **2013–2016**: Master of Science in Mathematics, Uppsala University. *Thesis: "Mean Field Approximations of Spatial Models of Evolution"*
- **2010–2013**: Bachelor of Science in Mathematics, Uppsala University. *Thesis: "Evolutionary Language Games"*
- **Spring 2014**: Erasmus Exchange, Mathematical Biology, Technische Universität München, Germany.
- **2012–2014**: Additional coursework in Linguistics and Nordic Languages at University of Iceland, Uppsala University, and Helsinki University (72 ECTS in total), studied in parallel with studies in Mathematics.

Industrial Experience

- **2014**: Analyst, Precis Digital, Stockholm, Sweden. Worked on Bayesian statistical modeling for price optimization of Google Ads and developed Markov models and game theoretical models for attribution processes.

Publications

4. **Linnéa Gyllingberg**, Yu Tian, David J.T. Sumpter. *A minimal model of cognition based on oscillatory and reinforcement processes*, Journal of the Royal Society Interface, 2025.
3. **Linnéa Gyllingberg**, David J.T. Sumpter, Åke Brännström. *Finding analytical approximations for discrete, stochastic, individual-based models of ecology*, Mathematical Biosciences, 2023.
2. **Linnéa Gyllingberg**, Alex Szorkovszky, David J.T. Sumpter. *Using neuronal models to capture burst and glide motion and leadership in fish*, Journal of The Royal Society Interface, 2023.
1. **Linnéa Gyllingberg**, Abeba Birhane, David J.T. Sumpter. *The lost art of mathematical modelling*, Mathematical Biosciences, 2023.

Grants

Total Funding Awarded: SEK 3,600,000 (approx. USD 335,000)

- **2024–2026**: Knut and Alice Wallenberg Postdoctoral Fellowship (USD 175,000).
- **2024**: Fulbright Research Scholar (SEK 63,000).
- **2024**: STINT International Postdoc Fellowship (SEK 1,200,000, offered, declined).
- **2024**: Lennanders Postdoctoral Fellowship (SEK 300,000, offered, declined).
- **2016–2024**: Multiple travel and research grants (total: SEK 408,000), including:
  - **2023, 2024**: G.S. Magnuson Foundation (total: SEK 56,500).
  - **2024**: Uddeholms Travel Scholarship (SEK 30,000).
  - **2024**: Knigge Travel Grant (SEK 2,500).
  - **2024**: Sederholms Travel Grant (SEK 29,000).
  - **2024**: Tullberg Grant for Biological Research (SEK 37,000).
  - **2023, 2024**: Liljewalch Travel Scholarship (total: SEK 50,000).
  - **2023**: Zandréns Grant (SEK 15,000).
  - **2023**: G-Research Grant for Early Career Researchers (GBP 1,200).
  - **2017–2024**: Anna Maria Lundin Travel Scholarship (total: SEK 122,500).
  - **2016**: Wilgott Stenholm Travel Scholarship (SEK 49,500).

Workshops, Summer Schools and Shorter Research Visits

- **January 2025**, Women in Mathematical Computational Biology Workshop, Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, USA.
- **May 2024**, The Lake Como Summer School: *"Complex Networks: Theory, Methods, and Applications,"* Como, Italy.
- **April 2024**, Research visit to Dr. Audrey Dussutour's lab, Centre national de la recherche scientifique (CNRS), Toulouse, France.
- **January 2024**, Research visit to Professor Mason Porter's group, Department of Mathematics, University of California, Los Angeles, USA.
- **August 2018**, The Helsinki Summer School on Mathematical Ecology and Evolution, Turku, Finland.

Awards

- **2023**: Awarded O. Andrén's Scholarship (SEK 25,000). Awarded to a Ph.D. student at Uppsala University for exceptional academic performance.
- **2019**: Uppsala Electrical Engineering Students' Pedagogical Prize, Uppsala University.
- **2017**: Best Talk at Imperial College London Society for Industrial and Applied Mathematics (SIAM) 3rd Annual Conference, Imperial College, London, UK

Teaching Experience

Lecturer & Course Instructor

- **Transform Methods (1MA034)**, Uppsala University *Lecturer, Course Designer, and Examiner (Autumn 2017 and 2018)*
  - Designed and delivered lectures, developed assignments, and assessed student performance.
  - Course evaluation scores: *4.9/5 (2017), 4.7/5 (2018).*
  - Awarded the Uppsala Electrical Engineering Students' Pedagogical Prize (2019) for excellence in teaching this course.

Guest Lecturer

- **Perceptions of U.S. Abroad (GLBLST 19)**, UCLA (Winter 2025).
- **Mathematical Methods of Physics (1FA121)**, Uppsala University (Spring 2024).
- **Modelling of Dynamic Systems (1RT155)**, Uppsala University (Spring 2023).

Teaching Assistant

Extensive experience as a teaching assistant over ten years, covering a range of undergraduate mathematics courses. Responsibilities included leading problem-solving sessions, supervising exercises, and grading.

- **Transform Methods (1MA034)** (2013, 2015, 2016, 2019, 2022).
- **Single Variable Calculus (1MA013)** (2013, 2015, 2016, 2021).
- **Linear Algebra and Geometry I (1MA025)** (Autumn 2016).
- **Mathematics Project with LaTeX (1MA193)** (Spring 2018).
- **Introduction to Studies in Mathematics (1MA219)** (Autumn 2018).

Summer Review Course Lecturer

Taught intensive review courses to help students prepare for final exams.

- **Transform Methods (1MA034)** (Summer 2015).
- **Algebra I (1MA004)** (Summer 2014).
- **Single Variable Calculus (1MA013)** (Summer 2013).

Selected Presentations and Talks

Invited Talks & Seminars

- **Institute for Pure and Applied Mathematics**, UCLA, USA, 2024. *"Mathematical models of basal cognition."*
- **Brainnet+ Workshop**, Royal Institute of Technology, Stockholm, Sweden, 2024. *"Beyond Neurons: Modeling Basal Cognition in Slime Molds."*
- **The National Institute for Theoretical and Computational Sciences**, Stellenbosch University, South Africa, 2024. *"Modeling Basal Cognition."* (Online Seminar)
- **Icelab**, Umeå University, Sweden, 2024. *"Modeling Basal Cognition."*
- **Collective Behaviour Seminar**, Online, 2024. *"Using neuronal models to capture burst-and-glide motion and leadership in fish."*

Conference & Workshop Presentations

- **Biological Systems that Learn**, National Institute for Theory and Mathematics in Biology (NITMB), Chicago, USA, 2025. Poster: *"Oscillations and Adaptation: Mathematical Models of Non-Neural Cognition."*
- **AI4Research Annual Workshop**, Uppsala University, Sweden, 2023. Poster: *"The lost art of mathematical modeling—How should we do mathematical modeling in the machine learning era?"*
- **Collective Behaviour Workshop**, Isaac Newton Institute, Cambridge, UK, 2023. Talk: *"Using neuronal models to capture burst-and-glide motion and leadership in fish."*

- **Collective Intelligence Symposium**, Santa Fe Institute, New Mexico, USA, 2023. Poster: *"The lost art of mathematical modelling."*
- **Data-Driven Mechanistic Mathematical Modelling for Life-Science Applications**, Chalmers University, Gothenburg, Sweden, 2023. Talk: *"The lost art of mathematical modelling—How should we do mathematical modelling in the machine learning era?"*
- **Conference on Complex Systems**, Cancún, Mexico, 2017. Talk: *"Spatial models of the evolution of social behaviour: Can helping and non-helping behaviour coexist?"*
- **Imperial College London SIAM 3rd Annual Conference**, Imperial College London, UK, 2017. Talk: *"Spatial models of the evolution of social behaviour: Can helping and non-helping behaviour coexist?"*
- **9th Workshop on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS)**, Turin, Italy, 2018. Talk: *"A spatial model for the evolution of social behaviour."*
- **8th Swedish Meeting on Mathematics in Biology**, Gothenburg, Sweden, 2016. Talk: *"The evolution of reproductive helping through resource competition."*

Science Outreach & Diversity Initiatives

- **2024–2025**: Mentor, "Women in Mathematics" Program, UCLA. Mentoring female graduate and undergraduate students in mathematics.
- **2017–2018**: Organizer, Breakfast Meetings for Women and Non-Binary Math Students, Uppsala University. Organized regular breakfast meetings to create a social and supportive space for women and non-binary students in mathematics.
- **2014**: Organizer, Mathematics Day for Female High School Students, Uppsala University. Planned and ran a one-day event to encourage high school girls to study mathematics.

Professional Activities

Reviewer

- Mathematical Biosciences
- Discrete and Continuous Dynamical Systems Series B
- Chaos, Solitons & Fractals
- Analysis and Mathematical Physics

Institutional Committee Service

- **2016–2018**: Ph.D. Student Representative, Equal Opportunities Group, Department of Mathematics, Uppsala University.
- **2013–2014**: Student Representative, Academic Senate, Uppsala University.
- **2012–2014**: Student Representative, Educational Board of Science, Uppsala University.
- **2012–2014**: Student Representative, Equal Opportunities Group, Department of Mathematics, Uppsala University.

- **2013–2014**: Student Representative, Master Programme Council of Mathematics, Uppsala University.
- **2013–2014**: Student Representative, Bachelor Programme Council of Mathematics, Uppsala University.