Adrian Martini

St John's College, Oxford, OX1 3JP, UK

adrian.martini@sjc.ox.ac.uk

ORCID iD: 0000-0001-9350-1338

Qualifications

University of Oxford 2020–

- DPhil in Statistics under *A. Etheridge*
- Stochastic partial differential equations, large deviations
- Mathematical biology, population models

University of Bonn 2018–2020

- M.Sc. in Mathematics, Grade: 1.1, *ausgezeichnet* (excellent)
- Thesis: The Killed Mollified Super Brownian Motion and Paracontrolled Wild Sums | supervised by *M. Gubinelli* and *A. Bovier*
- Paracontrolled distributions, superprocesses, mean-field systems, Malliavin calculus

University of Bonn 2015–2018

- B.Sc. in Mathematics, Grade: 1.5, *sehr gut* (very good)
- Thesis: Construction and Qualitative Properties of the Fleming-Viot Process | supervised by *A. Bovier* and *M. Gubinelli*

Research Experience

Project: Singular Stochastic PDEs in Mathematical Biology 2019–

- Explore applications of singular stochastic PDEs in population dynamics
- Resulted in one M.Sc. thesis, one preprint and one manuscript in progress

Additive Noise Approximation to Keller–Segel–Dean–Kawasaki Dynamics | with A. Mayorcas, 2020–

Part I: Local Well-Posedness of Paracontrolled Solutions

- Constructed a two-dimensional, singular stochastic PDE with Coulombian advection and additive noise by using paracontrolled calculus
- Uncovered the interplay between symmetries in the interaction and heterogeneities in the noise; their effects on renormalising counter-terms
- Preprint: arXiv:2207.10711; submitted

Part II: Small Noise Results

- Apply Part I to establish a law of large numbers, a central limit theorem and a large deviation principle for vanishing noise intensities and correlation lengths

- Consider LDPs for inhomogeneous Banach-space valued Wiener chaoses to generalize Freidlin–Wentzell theory to stochastic PDEs

The Killed Mollified Super Brownian Motion and Paracontrolled Wild Sums | M.Sc. thesis, University of Bonn, 2020

- Reverse-engineered T. Rosati's construction of a killed super Brownian motion in a white noise environment
- Constructed Rosati's process as a scaling limit of branching Brownian motions instead of branching random walks
- Developed a novel construction of singular stochastic PDEs with multiplicative noise and quadratic reaction terms based on Wild sums

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Awards and Prizes

Full Scholarships: St John's College Lamb & Flag Scholarship (£61,140: 2020–2024); EPSRC DTP in Statistics, (£23,910: 2020–2023)

Competitive Programs: Summer School 'Statistical Mechanics and Stochastic PDEs', Fondazione Centro Internazionale Matematico Estivo Roberto Conti, Cetraro, Italy (full grant towards living expenses; 630€: 2023); Junior Trimester Program 'Stochastic modelling in the life science: From evolution to medicine', Hausdorff Research Institute for Mathematics, Bonn, Germany (2,000€: 2022)

Academic Grants: St John's College Special Grants (for research visits; £1,000: 2022; £300: 2021); St John's College Academic Grants (for research equipment; £497: 2022; £370: 2021; £464: 2020)

Scholarly Presentations

- Invited talk (1.5h), Research Seminar Stochastics, Free University of Berlin, 2022
- Invited talk (1.5h), Research Seminar Stochastics, Free University of Berlin, 2023
- Contributed talk (15min), Summer School 'Statistical Mechanics and Stochastic PDEs', Fondazione Centro Internazionale Matematico Estivo Roberto Conti, Cetraro, Italy, 2023

Academic Experience

Visiting Researcher | Hausdorff Research Institute for Mathematics, Bonn, Germany 2022

- Junior Trimester Program, Stochastic modelling in the life science: From evolution to medicine
- Co-organized interdisciplinary academic workshops and a summer school for 70+ international researchers, suggested topics and reached out to speakers

Seminar Organizer | Etheridge Group Seminar, online 2021–2022

- Organized 32 talks by junior scientists, reached out to speakers, moderated discussions

Reading Group Organizer | University of Oxford, UK 2020–2021

- Organized 10h+ of presentations and discussions on singular stochastic PDEs with 7+ participants

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Teaching Experience

Merton College, University of Oxford, UK

- Graduate Student Tutor for Prelims: Introductory Calculus (upcoming) 2023–2024

Deutsche Schülerakademie (German Pupil Academy), Germany

- Course leader, joint with S.-M. Mellis 2023
  - Introduced 16 pupils (15-20 years old) to university-level mathematics
  - Prepared introductory material and lecture notes for a two-week long, 50h course with 25 classes
  - 'Mathematics Meets Reality', stochastic models in the life sciences; outreach

Department of Statistics, University of Oxford, UK

- Class Tutor for 3rd Year Applied Probability under *C. Goldschmidt* 2022 & 2023
  - Prepared 4 tutorial classes for two sets of 10-15 students each
  - Discussed exercises and solutions, summarized and explained lecture material
  - Continuous-time Markov chains, branching processes, queuing processes
  - Evaluation (2023): 88% strongly agreed my classes were worthwhile ($n = 8$)
- Teaching Assistant for 3rd Year Applied Probability under *C. Goldschmidt* 2021
  - Responsible for the marking of 20+ bi-weekly exercise sheets

University of Bonn, Germany

- Tutor for M.Sc. course Markov Processes under *A. Eberle* 2019–2020
  - Delivered 14 exercise classes for 10-20 students
  - Marked 4-6 weekly exercise sheets
  - Evaluation: 33.3% very good, 50% good, 16.7% satisfactory ($n = 6$)
- Tutor for M.Sc. course Stochastic Analysis under *A. Eberle* 2019
  - Evaluation: 88.9% very good, 11.1% good ($n = 9$)
- Tutor for B.Sc. course Foundations in Stochastic Analysis under *A. Eberle* 2018–2019
  - Evaluation: 80% very good, 20% good ($n = 10$)
- Tutor for B.Sc. course Introduction to Probability Theory under *A. Eberle* 2017–2018
  - Evaluation: 50% very good, 50% good ($n = 10$)
- Tutor for B.Sc. course Analysis 2 under *B. Niethammer* 2017
