

Matthieu Darcy

Website

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EDUCATION

Caltech Ph.D. student in Computing and mathematical Sciences. Advisors: Profs. Houman Owhadi, Andrew M. Stuart.	Pasadena, California 2021–present
ENS Paris-Saclay - Institut Polytechnique de Paris Mathématiques Vision et Apprentissage, with Highest Honors.	Paris, France 2020–2021
Imperial College London MSc Applied Mathematics, with Distinction.	London, United Kingdom 2019–2020
King's College London BA Mathematics and Philosophy, first class.	London, United Kingdom 2016–2019

EXPERIENCE

Janssen Pharmaceuticals - Machine learning consultant. Machine learning and mathematical modeling for drug discovery.	05/23 - Present
French Commission for Atomic Energy - Research intern, Deep Learning for Hexahedral Meshing.	05/2021-08/2021
Imperial College London - Research project. Application of Kernel Flows to regression.	05/2020-09/2020

RESEARCH INTEREST

I am interested in the applications of wavelets, Gaussian processes and kernel methods to problems in Machine learning and Applied Mathematics.

- **Stochastic Differential Equations:** inference of the drift and diffusion of stochastic differential equations.
- **Stochastic Partial Differential Equations:** data-driven approaches to solving SPDEs.
- **Operator Learning:** learning non-linear operators using kernel methods, with applications to PDEs and integro-functional equations.
- **Dynamical Systems:** learning dynamical systems from data.

PUBLICATIONS AND PREPRINTS

- [1] P. Batlle, M. Darcy, B. Hosseini, and H. Owhadi, *Kernel methods are competitive for operator learning*, 2023. arXiv: 2304.13202 [stat.ML].
- [2] M. Darcy, B. Hamzi, G. Livieri, H. Owhadi, and P. Tavallali, “One-shot learning of stochastic differential equations with data adapted kernels”, *Physica D: Nonlinear Phenomena*, vol. 444, p. 133 583, 2023, ISSN: 0167-2789.

- [3] M. Darcy, B. Hamzi, J. Susiluoto, A. Braverman, and H. Owhadi, *Learning dynamical systems from data: A simple cross-validation perspective, part ii: Nonparametric kernel flows*, Dec. 2021.

CONFERENCES AND SEMINARS

- 10th International Congress on Industrial and Applied Mathematics, August 2023 - Presentation.
- Argonne National Lab LANS Seminar, August 2023 - Presentation.
- Workshop on Establishing Benchmarks for Data-Driven Modeling of Physical Systems (USC), April 2023 - Presentation.
- SIAM conference on the Application of Dynamical Systems, May 2023 - Presentation.
- SIAM conference on Computational Sciences and Engineering, February 2023 - Presentation.
- Third Symposium on Dynamical Systems and Machine Learning 2022 (Fields Institute) September 2022 - Poster.
- International Conference on Continuous Optimization 2022, July 2022 - Presentation.
- Caltech SIAM chapter 2022 - Presentation.
- Second Symposium on Dynamical Systems and Machine Learning 2020 (Fields Institute) - Presentation.

COMPUTING AND PROGRAMMING

- **Python:** proficient in numpy, scikit-learn, scipy, JAX, pandas, pytorch.
- **Julia:** intermediate.
- **LaTeX:** proficient.

TEACHING AND OUTREACH

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| • SIAM chapter
<i>Organization of student talks and seminars.</i> | 2023 |
| • Teaching Assistant for graduate-level courses at Caltech
<i>ACM 118: Stochastic Processes and Regression, 2023.</i> | 2023 |
| • Refresher course lecturer for incoming graduate students at Caltech
<i>Developed and taught a course reviewing linear algebra and functional analysis.</i> | 2022 |

LANGUAGES

- **English:** native.
- **French:** native.