

Simon Martin

Sierra, INRIA Paris
Center for Data Science, ENS Paris

✉ Email

🌐 Webpage

📄 Scholar



Education

- 2022–2023 **Master's degree in Probabilities and Statistics**, *Mathématiques de l'aléatoire*, Université Paris-Saclay, with honour
- 2019–2021 **Master's degree in Physics**, *ICFP Soft Matter*, ENS Paris, with honour
- 2018–2019 **Maths-Physics bachelor**, ENS Paris
- 2016–2018 **MPSI-MP***, *Lycée Louis le Grand*

Professional Experience

- Since Sep 2023 **PhD**, *Data Science Center (ENS Paris) and Sierra Team (INRIA Paris)*, under the supervision of Francis Bach and Giulio Biroli, "Energy Landscapes and Dynamics of Deep Neural Networks"
Use of applied mathematics and statistical physics tools to solve optimization problems in high dimensions, with a focus on gradient flow dynamics.
- Apr 2023 – Jul 2023 **Research Internship**, *Data Science Center (ENS Paris) and Sierra Team (INRIA Paris)*, under the supervision of Francis Bach and Giulio Biroli.
- Mar 2022 – Jul 2022 **Research Internship**, *ENS Physics Department (LPENS)*, under the supervision of Thierry Mora and Aleksandra Walczak, "Simulation based inference for evolutionary trees".
- Sep 2021 – Feb 2022 **Research Internship**, *Thales Research and Technology*, under the supervision of Pierre-Yves Lagrave, "Gauge Equivariants Neural Networks"
- May 2021 – Jul 2021 **Research Internship**, *Thales Research and Technology*, under the supervision of Vincent Kemlin, "Hydrodynamic measurements by optic fibre laser"
- Mar 2020 – Jul 2020 **Research Internship**, *Oxford University, Department of Physics*, under the supervision of Julien Devriendt, "The role of magnetic fields during supermassive blackhole accretion".
- Jun 2019 **Internship**, *Institut d'Astrophysique de Paris*, under the supervision of Robert Mochkovitch, "Neutron star merger and electromagnetic counterparts".
- 2021–2023 **Maths oral examination**, *MP**, Lycée Louis-le-Grand

2018–2022 **Maths oral examination**, *MP**, Lycée Charlemagne

2018–2019 **Maths oral examination**, *PSI**, Lycée Saint-Louis

Publications

- 2024 Antoine Maillard, Emanuele Troiani, **Simon Martin**, Florent Krzakala, Lenka Zdeborová. Bayes-optimal learning of an extensive-width neural network from quadratically many samples. ArXiv preprint. PDF.
- 2024 **Simon Martin**, Francis Bach, Giulio Biroli. On the Impact of Overparameterization on the Training of a Shallow Neural Network in High Dimensions. In *International Conference on Artificial Intelligence ad Statistics*, 3655-3663, PMLR, 2024. PDF.
- 2022 **Simon Martin**, Pierre-Yves Lagrave. On the Benefits of $SO(3)$ -Equivariant Neural Networks for Spherical Image Processing. Technical Report. PDF.