# Anna Korba

+33646022323 • anna.korba@ensae.fr • akorba.github.io

## Academic positions

**Simons Institute for the Theory of Computing** — **Sep. 2021–Dec 2021**
*Visiting Scientist* — *Berkeley, U.S.*

**Statistics department, ENSAE, CREST, IP Paris** — **Sep. 2020–Present**
*Assistant Professor* — *Palaiseau, France*

**Gatsby Unit, University College London (UCL)** — **Dec. 2018–Aug. 2020**
*Postdoctoral Researcher* — *London, U.K.*
Laboratory of Pr. Arthur Gretton.

## Education

**Télécom ParisTech** — **Oct. 2015–Oct. 2018**
*Ph.D. in Applied Mathematics (Machine Learning)* — *Paris, France*

- Title: Learning from Ranking Data: Theory and Methods
- Supervisor: Stephan Clémençon

**ENS Cachan** — **Sep. 2014–Jun. 2015**
*Master MVA, First class honours* — *Cachan, France*
Applied Mathematics for Computer Vision and Machine Learning.

**ENSAE ParisTech** — **Sep. 2012–Jun. 2015**
*Engineering degree, First class honours* — *Paris, France*
Applied Mathematics, Advanced Statistics & Economics.

**Lycée Henri IV** — **Sep. 2009–Jun. 2012**
*Classes préparatoires in Mathematics, Physics, Computer Science.* — *Paris, France*

## Publications

My research has been focused on kernel methods, optimal transport, sampling, optimisation and ranking data. My papers can be found at `https://scholar.google.fr/citations?user=dbH6E3kAAAAJ&hl=fr`. I have been regularly publishing in these Machine Learning conferences: International Conference on Machine Learning (ICML), Advances in Neural Information Processing Systems (Neurips), Artificial Intelligence and Statistics (Aistats), International Conference of Learning Representations (ICLR).

### Published papers

[1] Z. Chen, A. Mustafi, P. Glaser, A. Korba, A. Gretton, B. K. Sriperumbudur. *(De)-regularized Maximum Mean Discrepancy Gradient Flow.* Journal of Machine Learning Research, 2025.

[2] C. Bonet, C. Vauthier, A. Korba. *Flowing Datasets with Wasserstein over Wasserstein Gradient Flows.* ICML, 2025.

[3] C. Vauthier, A. Korba, Q. Mérigot. *Towards Understanding Gradient Dynamics of the Sliced-Wasserstein Distance via Critical Point Analysis.* ICML, 2025.

[4] H. Yu, A. Klami, A. Hyvärinen, A. Korba, O. Chehab *Density Ratio Estimation with Conditional Probability Paths.* ICML, 2025.

[5] J. Geuter, C. Bonet, A. Korba, D. Alvarez-Melis. *DDEQs: Distributional Deep Equilibrium Models through Wasserstein Gradient Flows.* AISTATS, 2025.

[6] I. Aouali, V-E. Brunel, D. Rohde, A. Korba. *Bayesian Off-Policy Evaluation and Learning for Large Action Spaces.* AISTATS, 2025.

[7] P. Marion, A. Korba, P. Bartlett, M. Blondel, V. De Bortoli, A. Doucet, F. Llinares-López, C. Paquette, Quentin Berthet. *Implicit Diffusion: Efficient Optimization through Stochastic Sampling.* AISTATS, 2025.

[8] O. Chehab, A. Korba, A. Stromme, A. Vacher. *Provable Convergence and Limitations of Geometric Tempering for Langevin Dynamics.* ICLR, 2025.

[9] C. Bonet, T. Uscidda, A. David, P-C. Aubin-Frankowski, A. Korba. *Mirror and Preconditioned Gradient Descent in Wasserstein Space.* Neurips, 2024.

[10] L. Chamon, M. Karimi, A. Korba. *Constrained Sampling with Primal-Dual Langevin Monte Carlo.* Neurips, 2024.

[11] C. Chazal, A. Korba, F. Bach. *Statistical and Geometrical properties of Kernel Kullback-Leibler divergence.* NeurIPS, 2024.

[12] T. Huix, A. Korba, A. Durmus, E. Moulines. *Theoretical Guarantees for Variational Inference with Fixed-Variance Mixture of Gaussians.* ICML, 2024.

[13] N. Chopin, F. Crucinio , A. Korba. *A connection between Tempering and Entropic Mirror Descent.* ICML, 2024.

[14] I. Aouali, V-E. Brunel, D. Rohde, A. Korba. *Unified PAC-Bayesian Study of Pessimism for Offline Policy Learning with Regularized Importance Sampling.* Uncertainty in Artificial Intelligence (UAI), 2024.

[15] I. Aouali, D. Rohde, V-E. Brunel, A.Korba. *Exponential Smoothing for Off-Policy Learning*. ICML, 2023.

[16] L. Li, Q. Liu, A. Korba, M. Yurochkin, J. Solomon. *Sampling with Mollified Interaction Energy Descent*. ICLR, 2023.

[17] P.-C. Aubin-Frankowski, A. Korba, F. Léger. *Mirror Descent with Relative Smoothness in Measure Spaces, with application to Sinkhorn and EM*. Neurips, 2022.

[18] L. Xu, A. Korba, D. Slepcev. *Accurate Quantization for Particle-Based Optimization*. ICML, 2022.

[19] A. Korba, F. Portier. *Adaptive Importance Sampling Meets Mirror Descent.* Aistats, 2022.

[20] A. Korba, P-C. Aubin-Frankowski, S. Majewski, P. Ablin. *Kernel Stein Discrepancy Descent.* ICML, 2021.

[21] A. Mastouri, Y. Zhu, L. Gultchin, A. Korba, M. Kusner, R. Silva, K. Muandet, A. Gretton. *Proximal Causal Learning with Kernels: Two-Stage Estimation and Moment Restriction.* ICML, 2021.

[22] A. Korba, A. Salim, M. Arbel, G. Luise, A. Gretton. *A Non Asymptotic Analysis of Stein Variational Gradient Descent.* Neurips, 2020.

[23] A. Salim, A. Korba, G. Luise. *Wasserstein Proximal Gradient.* Neurips, 2020.

[24] M. Arbel, A. Korba, A. Salim, A. Gretton. *Maximum Mean Discrepancy Gradient Flow.* Neurips, 2019.

[25] M. Achab*, A. Korba*, S. Clémençon. *Dimensionality Reduction for Bucket Ranking: A Mass Transportation Approach.* Algorithmic Learning Theory (ALT), 2019. (*: equal contribution).

[26] A. Korba, A. Garcia, F. D'Alché-Buc. *A Structured Prediction Approach for Label Ranking*. Neurips, 2018.

[27] S. Clémençon, A. Korba, E. Sibony. *Ranking Median Regression: Learning to Order through Local Consensus.* Algorithmic Learning Theory (ALT), 2018.

[28] A Korba, S. Clémençon, E. Sibony. *A Learning Theory of Ranking Aggregation.* Aistats, 2017.

[29] Y. Jiao, A. Korba, E. Sibony. *Controlling the distance to a Kemeny consensus without computing it.* ICML, 2016.

## Selected/Recent Invited talks

The list of (most of) my talks (along with the slides) is available at `akorba.github.io/Talks.html`.

- Department of Decision Sciences seminar, Bocconi, November 2024.
- Stochastic and Stastistics seminar series of MIT, October 2024.
- Workshop on recent advances and future directions on sampling, Yale, October 2024.
- Frontiers in interacting particle systems, aggregation-diffusion equations & collective behavior, Centre International de Rencontres Mathématiques (CIRM), Marseille, France. 3 day Lecture on "Wasserstein gradient flows and applications to sampling in machine learning " to young researchers in a summer school organized by Jose Carrillo, June 2024.
- International Conference of Machine Learning (ICML) tutorial (talk shared with Adil Salim), Baltimore, July 2022.

## Other research activities

### Supervision

- Phd students: Tom Huix, co-supervised with Eric Moulines and Alain Durmus at CMAP, Polytechnique, 2021-2024; Imad Aouali (CIFRE), co-supervised with Victor-Emmanuel Brunel (CREST) and David Rohde (Criteo Research), 2022-2025; Christophe Vauthier, co-supervised with Quentin Mérigot (Université Paris-Saclay), 2023-2026; Clémentine Chazal, 2024-2027; Yedidia Agnimo, Paul Caucheteux, Marguerite Petit-Talamon, Oussama Zekri, 2025-2028.
- Postdocs: 2023-?: Omar Chehab, Adrien Vacher, Clément Bonet.
- Interns: Mahdi Attia (Ensta, M1 student, summer 2022); Adam David (Polytechnique, M2 student, summer 2023), Clémentine Chazal (ENS, M2 student, fall 2023), Marguerite Petit-Talamon (Dauphine, fall 2024).

### Committees

- PhD committees (13 since 2022): list.
- Hiring committees (2/3 per year, for assistant professor positions): Télécom ParisTech, Télécom SudParis, Ecole Polytechnique, Université Paris-Dauphine.
- PGMO PhD award committee (July 2023).

### Reviewing

- **Conferences:** Neural Information Processing System (NeurIPS), International Conference of Machine Learning (ICML), Artifical Intelligence and Statistics (AISTATS).
- **Journals:** (recurrent) Journal of Machine Learning Research; (occasionally) Bernoulli, Journal of the Royal Statistical Society, Mathematical Programming, International Journal of Forecasting, Biometrika.

### Scientific events organization

- July 2025: Co-organizer of the workshop Wasserstein Gradient Flows in Math and Machine Learning at Banff International Research Station, Canada.
- December 2023: Co-organizer of the workshop Optimal Transport and Machine Learning at NeurIPS 2023, New Orleans.
- May 2023: Co-organizer with Adil Salim and Avetik Karagulyan of a mini-symposium on "Wasserstein gradient flows and applications" at Siam conference of Optimization, Seattle.
- 2021: Organizer of the weekly working group/seminar on "Sampling with kernelized Wasserstein gradient flows" at the Simons program "Geometric Methods in Optimization and Sampling".
- 2019-20: Co-organizer of the CSML seminar (Computer Science and Machine Learning) at University College London and of Gatsby Unit external seminar .

### Funding/awards

- 2022: Co-recipient of Square funding of American Institute of Mathematics for a research project for 4 years.
- 2023: Co-recipient of PEPR funding led by Antonin Chambolle
- 2023: Recipient of ANR JCJC "Wasserstein gradient flows for Optimization and Sampling", ∼202k, 3 years.
- 2023: Recipient of Google and Apple Research funding for my research (30k and 70k$ respectively).

## Professional experience

### Teaching

**ENSAE ParisTech** **Sep. 2020- Present**
*Lecturer* *Palaiseau, France*

- Measure theory lectures for 1rst year students at ENSAE.
- Statistics lectures for 3rd year students at ENSAE (Master 2).
- Sampling with MCMC and Generative Modeling lectures and practical sessions for 3rd year students at ENSAE.

**Télécom ParisTech** **Oct. 2015–Oct. 2018**
*Teaching assistant* *Paris, France*

- Practical sessions for Master's students for several courses: Machine Learning (Python), Econometrics (Matlab), Introduction to Bayesian Learning (R).
- Supervision of long-run Master's students Machine Learning projects with companies.

### Admin responsibilities

**Polytechnique** **Sep. 2021- Present**
*Co-administrator* *Palaiseau, France*

Shared management of the Master Data Science, one of the most selective masters in machine learning in France.

## Skills

**Languages**: French (native), English (fluent), Italian (intermediate).

**Programming**: Python, R, MATLAB (advanced).

**Others**: Latex (advanced), HTML/CSS, D3.js (basics).