Krzakala Florent

Researcher unique identifiers: Arxiv ,Google scholar (14800+ citation, H-index: 63+), ORCID
Date of birth: 22/03/1976 Nationality: French Web site: florentkrzakala.com

- **EDUCATION**

2011 Habilitation, Université Paris 6 UPMC, France
2002 PhD thesis, Université Paris 11 Orsay, France
1999 Master Physics, Université Paris 11, Orsay, France

- **POSITIONS**

Since 2020 Full Professor EE & Physics, Ecole Polytechnique Fédérale de Lausanne, Switzerland
2013-2020 Full Professor, Sorbonne Université & Ecole Normale Supérieure, Paris
2016-2020 Holder of the Chaire ENS-CFM on data science in Ecole Normale Supérieure, Paris
2004-2013 Associate professor in Ecole Supérieure de Physique et Chimie ESPCI Paris, France
2002-2004 Post-doc in the group of Prof. Parisi @ Universita di Roma La Sapienza, Italy

- **MAJOR INVITED POSITION ABROAD**

Spring 2025 Invited Research Professor in Mathematical Sciences Research Institute, Berkeley, USA
Spring 2019 Invited Researcher @ KITP Santa Barbara USA
Spring 2018 Invited Prof. semester @ Duke University, USA, Mathematics Department
Spring 2016 Invited Researcher semester @ Berkeley University, USA, Simons Institute for Computing
2008 & 2009 Invited Researcher semester @ Los Alamos Nat. Lab. CNLS, New Mexico, USA

- **FELLOWSHIPS AND AWARDS**

2018 - … Ellis Fellow member
2018 Prix Atos-Joseph Fourier 2018 in Artificial Intelligence
2015 - 2020 Member of the Institut Universitaire de France, Paris
2012 - 2017 PI ERC Consolidator grant project SPARCS 307087

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

Past Phd Students

- Marylou Gabrié (*PhD 2015-2018)* now **professor** @Ecole Polytechnique, Paris, France
- Jean Barbier (*PhD 2012-2015)* now **professor** @ICTP Trieste, Italy (ERC 2021)
- Antoine Maillard (*PhD 2017-2021) now* **researcher** @ INRIA, France
- Cedric Gerbelot (*PhD 2018-2022)* now **professor** @Ecole Normale Superieure, Lyon
- Sun Yifan (*PhD* 2012) now **lecturer** @Renmin University, China
- Alaa Saade (*PhD 2012-2016)* now **researcher engineer** @ Google Deepmind Paris, France
- Christophe Schülke (*PhD 2012-2016)* now **data scientist** @ Philips research
- Andre Manoel *(PhD 2012)* now **data scientist** @Microsoft Research, MSR Redmond, USA
- Maria Refinetti (*PhD 2018-2022*), now **researcher** @ GResearch
- Mathieu Hemery (*PhD 2012-2015*) *now* **postdoc** @ INRIA, France
- Jonathan Dong (*PhD* 2017-2020) *now* **postdoc** @ EPFL, Switzerland
- Alia Abarra (*PhD 2017-2020) now* **postdoc** @ EPFL, Switzerland
- Ruben Ohana *(PhD 2018-2022)* now **postdoc** @Simons Institute NYU

Past Postdoctoral fellows

- Ludovic Stephan (*Post-doc 2021-2024*) now **professor**@ENSAI Bretagne, France
- Gabriel Sicuro *(Postdoc 2020-2021)* now **lecturer@**King's college**,** London, UK
- Sebastian Gold (*Postdoc 2018-2020*) now **professor**@SISSA Trieste, Italy (ERC 2024)
- Laura Foini (*Postdoc 2016-2017*) now **researcher**@CNRS *Saclay,* France
- Bruno Loureiro (*Postdoc 2019-2022*) now **researcher**@CNRS *ENS PARIS,* France
- Alejandro Lage-Castellanos (*Postdoc 2017)* now **professor** @University of Havana, Cuba
- Angelique Drémeau (*Post-doc 2014*) now **professor**@ENSTA Bretagne, France
- Pan Zhang (*Postdoc 2012-2013)*, now **professor** @ Inst. of Theo. Physics in Beijing, China
- Luca Saglietti (*(Postdoc 2019-2020)* now **lecturer @**Boconni**,** Milan, Italy
- Eric Tramel, (*Postdoc 2012-2016)*, now **researcher** @Amazon Research, USA
- Boshra Rajaei (*Postdoc 2015*) now **professor** @Sadjad University, Iran
- Francesco Caltagirone (*Postdoc 2015)* now **researcher**@ Huawei research (Paris, France)

Current Phd Students: *Davide Ghio, Luca Pesce, Matteo Vilucchio, Luca Arnaboldi, Yatin Dandi*
Current Postdoc Students: *Pierre Mergny, Damien Barbier*

- **TEACHING ACTIVITIES :** Lectures as university professor on physics, mathematics, computer science & machine learning in ***EPFL Lausanne*** (since 2021)**,** ***Sorbonne Université*** & ***Ecole Normale Supérieure*** Paris (2013-2020) and ***ESPCI Paristech*** (2004-2014). I gave many invited lectures in *summer schools* internationally in USA (Aspen, Boulder, Berkeley, Princeton), China (Beijing), India (Bangalore), UK (London), Italy (Trieste, Como) & France (Les Houches). I also taught invited lectures in statistical inference & computer science in international universities such as ***Tokyo University, Duke University*** and ***Princeton University,*** and taught Machine Learning for private companies, such as Capital Fund Management.

•ORGANISATION OF INTERNATIONAL SCIENTIFIC MEETINGS: 9 conferences and 5 schools

- 5/2024: L*ausanne Event on Machine Learning and Neural Network theory* EPFL **[link]**
- 8/2023: *Theory of machine learning* (~100 participants) in Cargese **[link]**
- 8/2022: One month school on *Theory of Machine learning* (~70 participants) in Les Houches **[link]**
- 8/2020: 2 weeks school on *Theory of Machine learning* (~40 participants) in Les Houches **[link]**
- 8/2018: *Statistics physics and machine learning* (~100 participants) in Cargese **[link]**
- 2/2017: *Statistical physics, Learning, Inference and Networks*, Les Houches ~70 participants**[link]**
- 6/2016 : *Physics methods in biology & computer science, Sat. of StatPhys2016,* in ENS, ~100 parts **[link]**
- 8/2014 : 2 weeks School on *Spin glasses,* (~100 participants) in Cargese (Corsica) **[link]**
- 9/2013 : School on *Optimization & message passing* (~70 participants) Les Houches **[link]**
- 2/2012: *Bridging Stat. physics, optimization, inference & learning*, Les Houches ~70 participants
- 12/2011 : *Disordered systems and the Jamming Transition,* IHP Paris, ~70 participants **[link]**
- 6/2011: *Conference on Physics and Biological Systems*, Orsay ~50 participants
- 11/2010: *Statistical Physics of Complexity, & Biological information,* Orsay ~50 participants
- 7-12/32010 : School on *Stat. Phys. of Biological information* (~70 participants) Les Houches

•INSTITUTIONAL RESPONSIBILITIES & REVIEWING ACTIVITIES

2023 –… Action Editor, *Transaction of Machine Learning Research*
2018 –… Editorial Board, *Journal of Statistical Mechanics* / IOP Publishing
2016 – 2020 Organizer of the data science colloquium in Ecole Normale Paris: **link: youtube channel**
2016 – … Scientific Advisory Board & cofounder in **LightOn Inc**
2015 – 2017 Editorial Board, Scientific Report/ Nature Publishing
2013 Scientific Evaluation (HCERS), University of Grenoble/ France

Reviewer for physics journals (Nature, *PNAS*, Physical Review,…), machine learning & computer science conferences (ICML, NeurIPS, ICLR, ISIT, RANDOM, IASTAT, COLT,…). Area Chair for Neurips & ICLR. Reviewer for grant agencies, incl. ERC starting & advanced grants in PE1, PE2, PE6 & PE7, & French Agence Nationale de la Recherche (ANR). Member of 15 Ph.D & Habilitation committees 7 as president.

•MAJOR COLLABORATIONS: I have collaborated with hundreds of colleagues & students from many countries. My main collaborators have been Marc Mézard (ENS, Paris), Cris Moore (Santa Fe, U.S.A.); Sylvain Gigan (ENS, Paris) & Lenka Zdeborova (CNRS, France). I have been blessed to collaborate earlier with the **highest-cited theoretical physicist & Nobel price winner** (Giorgio Parisi, in Rome, H-index 134) and more recently the **highest-cited machine learning statistician** (Michael Jordan, in Berkeley, H-index 209). I further collaborated with **mathematicians & computer scientists** such as Elchanan Mossel (MIT, USA), Alice Guionnet (ENS Lyon), Yue Lu (Harvard, USA) & Amin Coja-Oghlan (Frankfurt, Germany), **Statisticians & machine learning experts** such as Andrea Montanari (Stanford, USA) and Eric Vanden-eijden (NYU, Paris), and **theoretical physicists** such as David Sherrington (Oxford, UK), Jorge Kurchan (ENS Paris), Hidetoshi Nishimori (TokyoTech, Japan) & Massimo Vergassola (UC San Diego).

•PUBLICATION TRACK: I have published >200 articles in peer-reviewed international journals and conference proceedings with **~15000** citations on Google Scholar. My h-index is **63** as of August 2024, and my i10-index is 174 (140 including publ. in the last 5 years). I take interdisciplinary literally and published in major journals in physics (*Phys. Rev. Lett., Phys Rev. X*), Information theory (*IEEE Trans. Inf. Theory*), mathematics (*Advances in mathematics, Annals of Statistics*) & high-impact journals (*Proc. Nat. Acad. Sci.*). I published in the most selective conferences in machine learning (*NIPS, ICML, AUI*), statistical learning theory (*COLT*), computer science (*STOC*), information theory (*ISIT, ITW*) & signal processing (*ICASPP*).

•INVITED PRESENTATION TO CONFERENCE, SCHOOLS AND UNIVERSITIES

I have given hundreds of **seminars in major universities & research centers** in physics, mathematics, computer science, electrical engineering, or statistics departments (*Princeton, Berkeley, Rudgers, Harvard, MIT, Chicago, Duke, Los Alamos, Santa Fe, New York University, ICTP Trieste, Rome, ETH Zurich, EPF Lausanne, London, Cambridge, Tokyo, etc…)* and presented my work in many **international conferences & workshops** in physics, computer science & applied mathematics. I have been invited by universities to spend periods ranging from a month *(Trieste, Torino, Beijing, Tokyo, Santa Fe, Boulder)* to a full semester *(Los Alamos, Berkeley, Duke, KITP, Santa Barbara)*. Recent talks, seminars, invitation and lectures includes:

- **Berkeley 2025,** *Invited semester at the* **Simons Laufer Mathematical Sciences Institute**
- **Lake Como 2024,** *Invited lecture* **Statistical Physics of Deep Learning**
- **Neurips 2023,** *Invited keynote on* **Mathematics of modern Machine Learning** *(M3L 2023)*
- **Princeton 2023,** *invited talk* **Learning Neural Nets with Neural nets?** [video]
- **Harvard 2023,** *invited talk* **Are Gaussian data all you need for machine learning theory?** [video]
- **TOPML 2021,** *invited talk* **Generalization in Machine Learning** [video]
- **Alan Turing Institute in London 2020,** *invited talk* **Statistics and computation** [video]
- **NeurIPS 2019,** *invited talk* @ NeurIPS workshop **Science meets Engineering of Deep Learning** [video]
- **1-4/2018** Lectures series *Topics in Probability theory* @ Duke University, USA **[course link]**

Teaching records

2007-2014 - ESPCI ParisTech (undergrad):

Period	Subject	Level	Type	Number of hours
2006-2013	Statistical Physics	L3	Tutorats	20h/year
2007-2013	Mathematics	L3/M1	Tutorats & exercices	20h/year
2008-2012	Quantum Mechanics	L3	Tutorats & exercices	30h/year
2004-2013	Computer Science	L3	Lectures & exercices	120h/year

2013-2020 Université Pierre & Marie Curie, Sorbonne Universités (undergrad):

Period	Subject	Level	Type	Number of hours
2013	Physics 101	L1	Exercices	30h/year
2014-2015	Numerical methods	L3	Exercices	26h/year
2016	Waves mechanics	L2	Exercices	26h/year
2013-2015	Statistical physics	L3	Lectures	60h/year
2018-2019	Thermodynamics	L3	Exercices	30h/year
2019-2020	Machine Learning	M1	Lectures	40h/year

2020-2022 Ecole Federal Polytechnique de Lausanne (undergrad):

Period	Subject	Level	Type	Number of hours
2024 - …	Statistical Physics	L3, Physics	Lectures	40h/year
2020- 2024	Quantum Mechanics	L3, Physics	Lectures	40h/year
2020- …	Statistics & ML	M1, EE	Lectures	26h/year
2020- …	Statistical Physics of computation	M1, Physics	Lectures	26h/year

Master lectures Sorbonne University (2016-2020): "Computational science" [link], in the international master of complex systems [link], 60h/year since 2016.

Post-graduate lectures in Ecole Normale Supérieure (2013-…):

I taught advanced lectures for post-graduate students in Ecole Normale Supérieure, for 30h/year:

* 2014: Statistical inference [link]
* 2015: Introduction to statistical learning [link]
* 2016: Machine Learning for Physicists [link]
* 2017: Deep learning: do-it-yourself [link] (this has been -to the best of my knowledge- the first lecture in *Deep Learning* proposed in Paris in a doctoral school)
* 2019: Introduction to machine learning: from random forrest to reinforcement learning [link]
* 2020: Statistical learning theory (in preparation)

Master lectures EPFL (2020- …): "Statistical physics of learning" [link]

Lecture given internationally in university & summer school

* Beijing (**China**), Spring School 2008 (8h) [link]
* Tokyo (**Japan**) Graduate lecture @ Tokyo University 2010 (8h)
* Les Houches (**France**), Predoctoral School On Statistical Physics 2015 (12h) [link]
* Cargese (**France**) 2015 (6h)
* Trieste (**Italy**), ICTP, Spring College School 2015 (8h) [link]
* Bangalore (**India**) ICTS, Winter School December 2016 (6h) [link video]
* UC Boulder, *Colorado* (**USA**): Juillet 2017 Summer School (8h) [link video]
* EPFL (Lausanne, **Switzerland**) Novembre 2017: Graduate lecture Physique/Math (16h)
* Duke University, *North Carolina* (**USA**):Math Graduate lecture, Spring 2018 (30h) [link]

Funding ID

2022-2026: SNSF Grant "OPtimal Estimation in RAndom Generative mOdelS" **(1 000 000€)**
2019-2023: Chaire Prairie "Institut Interdisciplinaire d'Intelligence Artificielle" **(450 000€)**
2019-2021: AAP IRIS SDDS (co-PI) "Sciences des données et données de la science" **(67 500€)**
2019 : Google Cloud Research grant (20000$)
2016-2020: Holder of the chair ENS-CFM "Modèles et Sciences des données" **(200 000€/year)**
2018-2021: Agence Nationale de la Recherche Project PAIL (PI) **(270 000€)**
2018-2019: DARPA project PIMLICo (co-PI) **(121 000 $)**
2017 : Microsoft Azure Research Award (5000$)
2011-2017: ERC Consolidator (PE7) SPARCS **(1 370 000€)**
2015-2016: PSL PSI:Paris (co-PI) (**67500€**)
2012-2013: Institut des systèmes complexes, Paris (PI)(**67500€**)
2009-2010: MIT-France Seed Fund grant for Quantum Adiabatic Algorithm (co-PI) (**15000€**)

Publication list: published books, journals articles & proceedings

As of June 2023, I have published 96 papers in international peer-reviewed journals, 95 papers in international peer reviewed conference proceedings, wrote two reviews, participated in a book, edited 2, wrote 3 popularisation articles, and a patent. Details follows:

- ***Popularisation***

[3] **Artificial intelligence: From electronics to optics [link]**
S. Gigan, F. Krzakala, L. Daudet & I. Carron, Photoniques Numéro 104, Septembre-Octobre 2020

[2] **Quels algorithmes pour quelles données? [link]**
Florent Krzakala et Lenka Zdeborová La Recherche, vol 537, Juillet-Aout 2018

[1] **Un algorithme issu de la physique pour traitement du signal [link]**
Florent Krzakala La Recherche, vol 461, Février 2012

- ***Books & long Reviews***

I have written two long reviews on different aspects of my research:

[6] **Statistical physics of inference: Thresholds and algorithms [link]**
Lenka Zdeborová, Florent Krzakala Advances in Physics Volume 65, 5 (2016)

[5] **The Quantum Adiabatic Algorithm applied to random optimization problems: the quantum spin glass perspective [link]**
V. Bapst, L. Foini, F. Krzakala, G. Semerjian, F. Zamponi Physics Reports 523, 127 (2013)

I edited the lecture notes of the Les Houches school I organised in 2023 and in 2013

[4] **Summer school on Statistical Physics of Machine learning: Lecture Notes of the Les Houches School of Physics [link]**: by F. Krzakala, L. Zdeborová, JSTAT publishing (2024)

[3] **Statistical Physics, Optimization, Inference, and Message-Passing Algorithms: Lecture Notes of the Les Houches School of Physics [link]**: by F. Krzakala, F. Ricci-Tersenghi, L. Zdeborová, R. Zecchina , Eric W. Tramel and Leticia F. Cugliandolo Oxford publishing (2013)

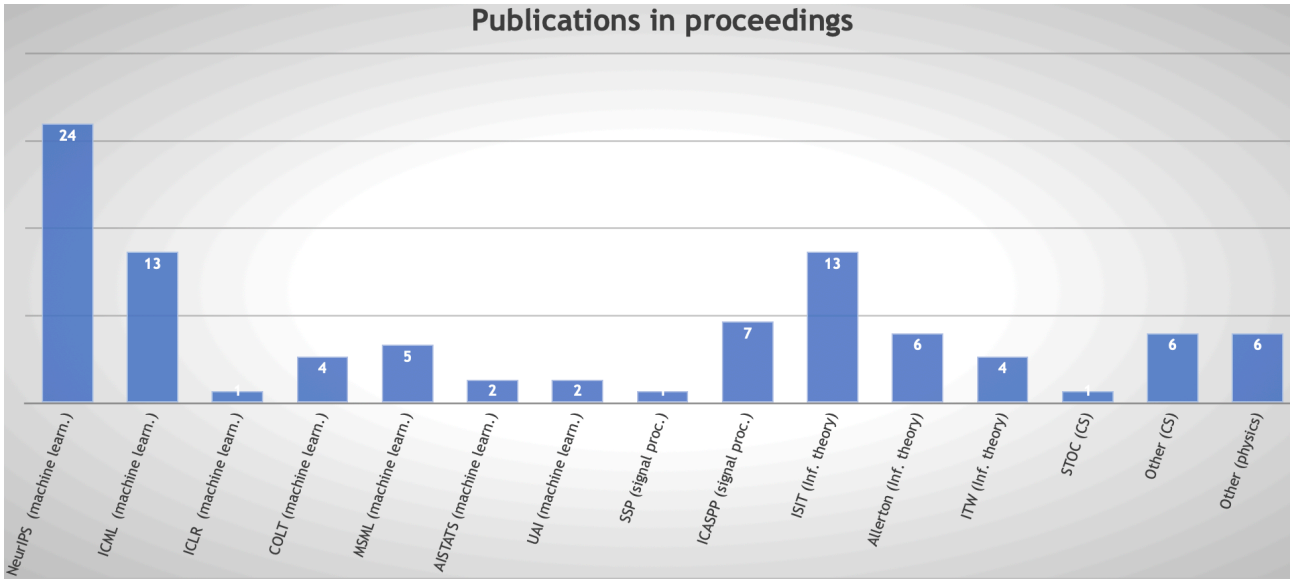
I guess-edited a series of special issue of Journal of Statistical Mechanics in Machine Learning, starting from 2019 ... here is the first one:

[2] **Machine Learning 2019, Journal of Statistical Mechanics: Theory and Experiment [link]**
Edited by F. M. Mezard, R. Zecchina, Y. Kabashima, B. Kappen, F. Krzakala & M. Opper.

I cowrote one chapter of the Les Houches school lecture notes I participated in 2002
[1] **Hiking through glassy phases: physics beyond aging** [link] L. Berthier, V. Viasnoff, O. White, V. Orlyanchik, FK, Lecture notes, Les Houches, July 2002 in *"Slow relaxations and nonequilibrium dynamics in condensed matter*"; Eds: J.-L. Barrat, J. Dalibard, M. Feigelman, J. Kurchan (Springer, Berlin, 2003)

- ***Conference proceedings***

As of June.'24 I have published 95 papers in international peer-reviewed conferences proceedings, mainly in machine learning, information theory, signal processing & computer science.



[95] **Fundamental limits of Non-Linear Low-Rank Matrix Estimations** Mergny, Pierre; Ko, Justin P; KRZAKALA, FLORENT; Zdeborova, Lenka [link], Proceedings of the 37rd Annual Conference on Learning Theory (COLT 2024).

[94] **Asymptotic Characterisation of the Performance of Robust Linear Regression in the Presence of Outliers** Matteo Vilucchio · Emanuele Troiani · Vittorio Erba ·, FK, [link] Proceedings of The International Conference on Artificial Intelligence and Statistics (AISTATS 2024)

[93] **Analysis of learning a flow-based generative model from limited sample complexity** Hugo Cui, Florent Krzakala, Eric Vanden-Eijnden, Lenka Zdeborová [link] Proceedings of the ICLR conference (2024)

[92] **Analysis of Bootstrap and Subsampling in High-dimensional Regularized Regression** Lucas Clarté, Adrien Vandenbroucque, Guillaume Dalle, Bruno Loureiro, Florent Krzakala, Lenka Zdeborová, [link] Proceedings of the 40th Conference on Uncertainty in Artificial Intelligence (UAI)

[91] **The Benefits of Reusing Batches for Gradient Descent in Two-Layer Networks: Breaking the Curse of Information and Leap Exponents** Yatin Dandi, Emanuele Troiani, Luca Arnaboldi, Luca Pesce, Lenka Zdeborova, Florent Krzakala, [link] Proceedings of the 41st International Conference on Machine Learning (ICML '24), PMLR 235:9991-10016, 2024.

[90] **Asymptotics of feature learning in two-layer networks after one gradient-step** Hugo Cui, Luca Pesce, Yatin Dandi, Florent Krzakala, Yue Lu, Lenka Zdeborova, Bruno Loureiro **[link]** Proceedings of the 41st International Conference on Machine Learning (ICML '24), PMLR 235:9662-9695, 2024.

[89] **Online Learning and Information Exponents: The Importance of Batch size & Time/ Complexity Tradeoffs** Luca Arnaboldi, Yatin Dandi, Florent Krzakala, Bruno Loureiro, Luca Pesce, Ludovic Stephan **[link]** Proceedings of the 41st International Conference on Machine Learning, (ICML '24)PMLR 235:1730-1762, 2024.

[88] **Spectral Phase Transition and Optimal PCA in Block-Structured Spiked Models** Pierre Mergny, Justin Ko, Florent Krzakala **[link]** Proceedings of the 41st International Conference on Machine Learning (ICML '24), PMLR 235:35470-35491, 2024.

[87] **Optimal Algorithms for the Inhomogeneous Spiked Wigner Model** A. Pak, J. Ko, FK, **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'23

[86] **Universality laws for Gaussian mixtures in generalized linear models** Y. Dandi, L. Stephan, F. Krzakala, B. Loureiro, L. Zdeborová, **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'23

[85] **From high-dimensional & mean-field dynamics to dimensionless ODEs: A unifying approach to SGD in two-layers networks** L. Arnaboldi, L. Stephan, FK, B. Loureiro **[link]**, Proceedings of the 36rd Annual Conference on Learning Theory (COLT 2023).

[84] **Compressed sensing with l0-norm: statistical physics analysis and algorithms for signal recovery** **[link]** D. Barbier, C Lucibello, L. Saglietti, FK, L. Zdeborova, IEEE Information Theory Workshop (ITW 2023)

[84] **Are Gaussian data all you need? Extents and limits of universality in high-dimensional generalized linear estimation** L. Pesce, FK, B. Loureiro, L. Stephan **[link]** Proceedings of the 39th International Conference on Machine Learning (ICML '23).

[83] **Optimal Learning of Deep Random Networks of Extensive-width** H. Cui, FK, L.Zdeborová **[link]** Proceedings of the 39th International Conference on Machine Learning (ICML '23).

[81] **Expectation consistency for calibration of neural networks** L. Clarte, B. Loureiro, FK, L. Zdeborova, **[link]** Proceedings of the Thirty-Ninth Conference on Uncertainty in Artificial Intelligence (UAI), PMLR 216:443-453, 2023

[80] **On double-descent in uncertainty quantification in overparametrized models** L. Clarte, B. Loureiro, FK, L. Zdeborova, **[link]** Proceedings of The 26th International Conference on Artificial Intelligence and Statistics (AISTATS) PMLR 206:7089-7125, 2023.

[79] **Phase diagram of Stochastic Gradient Descent in high-dimensional two-layer neural networks** R. Veiga, L. Stephan, B. Loureiro, FK, L. Zdeborová, **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'22

[78] **Subspace clustering in high-dimensions: Phase transitions & Statistical-to-Computational gap** L. Pesce, B. Loureiro, FK, L. Zdeborová, **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'22

[77] **Multi-layer State Evolution Under Random Convolutional Design** M. Daniels, C. Gerbelot, F. Krzakala, L. Zdeborová **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'22

[76] **Optimal denoising of rotationally invariant rectangular matrices** E. Troiani, V. Erba, FK, A. Maillard, L. Zdeborová, [link] Proc. of the 2nd Mathematical and Scientific Machine Learning Conference (MSML 2022), PMLR 190:97-112, 2022.

[75] **Fluctuations, Bias, Variance & Ensemble of Learners: Exact Asymptotics for Convex Losses in High-Dimension** B.. Loureiro, C. Gerbelot, M. Refinetti, G. Sicuro, F. Krzakala, **[link]** Proceedings of the 38th International Conference on Machine Learning (ICML '22).

[74] **Secure Coding via Gaussian Random Fields** **[link]** A. Bereyhi, B. Loureiro, F. Krzakala, R. R. Müller, H. Schulz-Baldes IEEE International Symposium on Information Theory (ISIT) (2022)

[73] **Adversarial Robustness by Design Through Analog Computing And Synthetic Gradients** **[link]** A. Cappelli, R. Ohana, J. Launay, L. Meunier, I. Poli, F. Krzakala, Proc. of the 2022 IEEE Inter. Conference on Acoustics, Speech & Signal Processing (ICASSP '22)

[72] **LightOn Optical Processing Unit: Scaling-up AI and HPC with a Non von Neumann co-processor** C. Brossollet *et al* [link] Proceedings IEEE Hot Chips 33, 2021

[71] **The Gaussian equivalence of generative models for learning with shallow neural networks** S. Goldt, B. Loureiro, G. Reeves, F. Krzakala, M. Mézard, L. Zdeborová [link] Proc. of the 2nd Mathematical and Scientific Machine Learning Conference (MSML 2021), PMLR 145:1-28, 2021

[70] **Construction of optimal spectral methods in phase retrieval** A. Maillard, F. Krzakala, Y. M. Lu, L. Zdeborová, [link] Proc. of the 2nd Mathematical and Scientific Machine Learning Conference (MSML 2021), PMLR 145:1-28, 2021

[69] **Learning Gaussian Mixtures with Generalized Linear Models: Precise Asymptotics in High-dimensions** B.. Loureiro, G. Sicuro, C. Gerbelot, A. Pacco, F. Krzakala, L. Zdeborová **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'21

[68] **Generalization Error Rates in Kernel Regression: The Crossover from the Noiseless to Noisy Regime** H. Cui, B. Loureiro, F. Krzakala, L. Zdeborová **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'21

[67] **Learning curves of generic features maps for realistic datasets with a teacher-student model** B. Loureiro, C. Gerbelot, H. Cui, S. Goldt, F. Krzakala, M. Mézard, L. Zdeborová **[link]** *Advances in Neural Information Processing Systems,* NeurIPS'21

[66] **Classifying high-dimensional Gaussian mixtures: Where kernel methods fail and neural networks succeed** M. Refinetti, S. Goldt, F. Krzakala, L. Zdeborova **[link]**

Proceedings of the 38th International Conference on Machine Learning (ICML ’21).

[65] Complex Dynamics in Simple Neural Networks: Understanding Gradient Flow in Phase Retrieval **[link]** S. Sarao Mannelli, G. Biroli, C. Cammarota, F. Krzakala, P. Urbani, L. Zdeborová *Advances in Neural Information Processing Systems,* NeurIPS’20

[64] **Dynamical mean-field theory for stochastic gradient descent in Gaussian mixture classification** **[link]** Francesca Mignacco, Florent Krzakala, Pierfrancesco Urbani, Lenka Zdeborová; *Advances in Neural Information Processing Systems,* NeurIPS’20

[63] **Phase retrieval in high dimensions: Statistical and computational phase transitions** **[link]** A. Maillard, B. Loureiro, F. Krzakala, L. Zdeborová, *Advances in Neural Information Processing Systems,* NeurIPS’20

[62] **Reservoir Computing meets Recurrent Kernels and Structured Transforms** **[link]** Jonathan Dong, Ruben Ohana, Mushegh Rafayelyan, Florent Krzakala, Advances in Neural Information Processing Systems, *oral presentation* at NeurIPS 2020

[61] **Generalization error in high-dimensional perceptrons: Approaching Bayes error with convex optimization** **[link]** B. Aubin, F. Krzakala, Y. M. Lu, L. Zdeborová *Advances in Neural Information Processing Systems,* NeurIPS’20

[60] **Direct Feedback Alignment Scales to Modern Deep Learning Tasks & Architectures** **[link]** J. Launay, I. Poli, F. Boniface, F. Krzakala, *Advances in Neural Information Proc. Syst.,* NeurIPS’20

[59] **Asymptotic errors for convex penalized linear regression beyond Gaussian matrices** Cédric Gerbelot, Alia Abbara, Florent Krzakala Proceedings of the 33rd Annual Conference on Learning Theory (COLT 2020).

[58] **Exact asymptotics for phase retrieval and compressed sensing with random generative prior** [link] B. Aubin, B. Loureiro, A. Baker, F. Krzakala, L. Zdeborová, Proc. of the 1st Mathematical and Scientific Machine Learning Conference (MSML 2020), PMLR 107:55-73, 2020

[57] **Rademacher complexity and spin glasses: A link between the replica and statistical theories of learning** [link] A. Abbara, B. Aubin, F. Krzakala, L. Zdeborová, Proc. of the 1st Mathematical and Scientific Machine Learning Conference (MSML 2020), PMLR 107:27-54, 2020

[56] **The role of regularization in classification of high-dimensional noisy Gaussian mixture** Francesca Mignacco, Florent Krzakala, Yue Lu, Pierfrancesco Urbani & Lenka Zdeborova Proceedings of the 37th International Conference on Machine Learning (ICML ’20).

[55] **Generalisation error in learning with random features and the hidden manifold model** Federica Gerace, Bruno Loureiro, Florent Krzakala, Marc Mezard & Lenka Zdeborova Proceedings of the 37th International Conference on Machine Learning (ICML ’20).

[54] **Double Trouble in Double Descent: Bias and Variance(s) in the Lazy Regime**

Stéphane d'Ascoli Maria Refinetti, Giulio Biroli, Florent Krzakala
Proceedings of the 37th International Conference on Machine Learning (ICML '20).

[53] **Kernel computations from large-scale random features obtained by Optical Processing Units** [link] R. Ohana, J. Wacker, J. Dong, S. Marmin, F. Krzakala, M. Filippone, L. Daudet, Proc. of the 2020 IEEE Inter. Conference on Acoustics, Speech & Signal Processing (ICASSP '20)

[52] **The spiked matrix model with generative priors** [link]
Benjamin Aubin, Bruno Loureiro, Antoine Maillard, Florent Krzakala, Lenka Zdeborová;
Advances in Neural Information Processing Systems, NeurIPS'19

[51] **Dynamics of stochastic gradient descent for two-layer neural networks in the teacher-student setup** [link] S. Goldt, M. S. Advani, A. M. Saxe, F. Krzakala, L. Zdeborová, Advances in Neural Information Processing Systems, *oral presentation* at NeurIPS 2019

[50] **Who is Afraid of Big Bad Minima? Analysis of Gradient-Flow in a Spiked Matrix-Tensor Model** [link] S. Sarao Mannelli, G. Biroli, C. Cammarota, F. Krzakala, L. Zdeborová, Advances in Neural Information Processing Systems, *spotlight presentation* @ NeurIPS 2019

[49] **Passed & Spurious: analysing descent algorithms and local minima in spiked matrix-tensor model** [link] S. Sarao Mannelli, F. Krzakala, P. Urbani, L. Zdeborová, Proceedings of the 36th International Conference on Machine Learning (ICML '19), PMLR 97:4333-4342, 2019.

[48] **Entropy and mutual information in models of deep neural networks,** [link]
M. Gabrié, A. Manoel, C. Luneau, J. Barbier, N. Macris, F. Krzakala, L. Zdeborová , Advances in Neural Information Processing Systems, 1821-1831 spotlight presentation @ NeurIPS'18

[47] **The committee machine: Computational to statistical gaps in learning a two-layers neural network** [link] B. Aubin, A. Maillard, J. Barbier, F. Krzakala, N. Macris, L. Zdeborová, Advances in Neural Information Processing Systems, *spotlight presentation* @NeurIPS'18

[46] **Estimation in the spiked Wigner model: A short proof of the replica formula** [link]
A. El Alaoui & F. Krzakala IEEE International Symposium on Information Theory (ISIT) (2018)

[45] **Optimal Errors and Phase Transitions in High-Dimensional Generalized Linear Models** [link] J. Barbier, F. Krzakala, N. Macris, L. Miolane, L. Zdeborová
Proceedings of the 31st Conference On Learning Theory, PMLR 75:728-731, 2018.(COLT 2018)

[44] **The Mutual Information in Random Linear Estimation Beyond i.i.d. Matrices** [link]
Jean Barbier, Nicolas Macris, Antoine Maillard, Florent Krzakala
IEEE International Symposium on Information Theory (ISIT), (2018)

[43] **Scaling Up Echo-State Networks With Multiple Light Scattering** [link]
Jonathan Dong ; Sylvain Gigan ; Florent Krzakala ; Gilles Wainrib
2018 IEEE Statistical Signal Processing Workshop (SSP) (2018)

[42] **Streaming Bayesian inference: theoretical limits and mini-batch approximate message-passing** [link] A. Manoel, F. Krzakala, E. W. Tramel, L. Zdeborová , 55th Conference on Communication, Control, and Computing (Allerton), Monticello, IL, USA, 1048-1055 (2017)

[41] **Decoding from Pooled Data: Phase Transitions of Message Passing** [link]
Ahmed El Alaoui, Aaditya Ramdas, Florent Krzakala, Lenka Zdeborová, Michael I. Jordan
IEEE International Symposium on Information Theory (ISIT), pages: 2780 - 2784 (2017)

[40] **Multi-Layer Generalized Linear Estimation** [link]
Andre Manoel, Florent Krzakala, Marc Mézard, Lenka Zdeborová
IEEE International Symposium on Information Theory (ISIT), pages: 2098-2102 (2017)

[39] **Statistical and computational phase transitions in spiked tensor estimation** [link]
Thibault Lesieur, Léo Miolane, Marc Lelarge, Florent Krzakala, Lenka Zdeborová
IEEE International Symposium on Information Theory (ISIT), pages: pp. 511-515. (2017)

[38] **Information-theoretic thresholds from the cavity method** [link]
A. Coja-Oghlan, F. Krzakala, W. Perkins, L. Zdeborová, In Proceedings of 49th Annual ACM SIGACT Symposium on the Theory of Computing, Montreal, Canada, June 2017 (STOC'17)

[37] **Fast Randomized Semi-Supervised Clustering** [link]
A. Saade, F. Krzakala, M. Lelarge, L. Zdeborová, International Meeting on "High-Dimensional Data-Driven Science"(HD^3-2017), Journal of Physics: Conf. Series 1036 (2018) 012015

[36] **Phase transitions and optimal algorithms in high-dimensional Gaussian mixture clustering** [link] T. Lesieur, C. De Bacco, J. Banks, F. Krzakala, C. Moore, L. Zdeborová 2016 54th Annual Allerton Conference on Communication, Control, and Computing (Allerton)

[35] **The Mutual Information in Random Linear Estimation** [link]
Jean Barbier, Mohamad Dia, Nicolas Macris, Florent Krzakala 2016 54th Annual Allerton Conference on Communication, Control, and Computing (Allerton), Pages: 625 - 632

[34] **Mutual information for symmetric rank-one matrix estimation: A proof of the replica formula** [link] Jean Barbier, Mohamad Dia, Nicolas Macris, Florent Krzakala, Thibault Lesieur, Lenka Zdeborová Advances in Neural Information Processing Systems 29 (NIPS 2016)

[33] **Inferring Sparsity: Compressed Sensing using Generalized Restricted Boltzmann Machines** [link] E.W. Tramel, A. Manoel, F. Caltagirone, M. Gabrié, F. Krzakala
IEEE Information Theory Workshop (ITW), Pages: 265 - 269 (2016)

[32] **Clustering from Sparse Pairwise Measurements** [link]
Alaa Saade, Marc Lelarge, Florent Krzakala, Lenka Zdeborová, Proceedings of the 2016 IEEE IEEE International Symposium on Information Theory (ISIT), pages: 780 - 784 (2016)

[31] **Mutual Information in Rank-One Matrix Estimation** [link]
F. Krzakala, J. Xu, L. Zdeborová 2016 IEEE Information Theory Workshop (ITW), 71 - 75 (2016)

[30] **Intensity-only optical compressive imaging using a multiply scattering material and a double phase retrieval approach** [link]
B. Rajaei, E. W. Tramel, S. Gigan, F. Krzakala, L. Daudet, Proceedings of the 2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) pages: 4054 - 4058

[29] **Matrix Completion from Fewer Entries: Spectral Detectability and Rank Estimation** [link] Alaa Saade, Florent Krzakala, Lenka Zdeborová
Advances in Neural Information Processing Systems (NIPS 2015) 28, pages 1261–1269 (2015)

[28] **Random Projections through multiple optical scattering: Approximating kernels at the speed of light** [link] A. Saade, F. Caltagirone, I. Carron, L. Daudet, A. Drémeau, S. Gigan, F. Krzakala Proc. of the 2016 IEEE Int. Conf. on Acoustics, Speech and Signal Proc. ICASSP (2016)

[27] **MMSE of probabilistic low-rank matrix estimation: Universality with respect to the output channel** [link] Thibault Lesieur, Florent Krzakala, Lenka Zdeborová 2015 53rd Annual Allerton Conference on Communication, Control, and Computing, page 680 - 687, (2015)

[26] **Scampi: a robust approximate message-passing framework for compressive imaging** J. Barbier, E. W. Tramel, F. Krzakala [link] Presented at the 2015 International Meeting on High-Dimensional Data Driven Science, Kyoto, Japan, J. Phys.: Conf. Ser. 699 012013 (HD^3-2015)

[25] **Spectral Detection on Sparse Hypergraphs** [link]
Maria Chiara Angelini, Francesco Caltagirone, Florent Krzakala, Lenka Zdeborová 53rd Annual Allerton Conference on Communication, Control, and Computing, pages 66 - 73, IEEE (2015)

[24] **Training Restricted Boltzmann Machines via the Thouless-Anderson-Palmer Free Energy** [link] Marylou Gabrié, Eric W. Tramel, Florent Krzakala
Advances in Neural Information Processing Systems (NIPS 2015) 28, pages 640–648. (2015)

[23] **Spectral Detection in the Censored Block Model** [link]
A. Saade, F. Krzakala, M. Lelarge, L. Zdeborová Information Theory (ISIT), 2015 IEEE International Symposium on , vol., no., pp.1184-1188, 14-19 June 2015

[22] **Phase Transitions in Sparse PCA** [link] T. Lesieur, F. Krzakala, L. Zdeborová, IEEE Inter. Symp. on Information Theory (ISIT), pp.1635-1639, 14-19 June 2015

[21] **Phase recovery from a Bayesian point of view: the variational approach** [link]
Angélique Drémeau, Florent Krzakala Acoustics, Speech and Signal Processing (ICASSP), 2015 IEEE International Conference on Year: 2015 Pages: 3661- 3665 (2015)

[20] **Adaptive Damping and Mean Removal for the Generalized Approximate Message Passing Algorithm**[link]
J. Vila, P. Schniter, S. Rangan, F. Krzakala, L. Zdeborová Acoustics, Speech and Signal Processing (ICASSP), 2015 IEEE International Conference on Year: 2015 Pages: 2021 - 2025

[19] **Sparse Estimation with the Swept Approximated Message-Passing Algorithm** [link]
Andre Manoel, Florent Krzakala, Eric W. Tramel, Lenka Zdeborová
Proceedings of the 32nd International Conference on Machine Learning (ICML), 2015, 1123-1132

[18] **Spectral Clustering of Graphs with the Bethe Hessian** [link]
Alaa Saade, Florent Krzakala, Lenka Zdeborová
Advances in Neural Information Processing Systems 27 (NIPS 2014) pp 406-414

[17] **Replica Analysis and Approximate Message Passing Decoder for Superposition Codes** [link] Jean Barbier, Florent Krzakala
IEEE International Symposium on Information Theory (ISIT), page(s) 1494 - 1498 (2014)

[16] **Variational Free Energies for Compressed Sensing** [link]
Florent Krzakala, Andre Manoel, Eric W. Tramel, Lenka Zdeborová
IEEE International Symposium on Information Theory (ISIT), page(s) 1499 - 1503 (2014)

[15] **On Convergence of Approximate Message Passing** [link]
Francesco Caltagirone, Florent Krzakala, Lenka Zdeborová Information Theory Proceedings (ISIT), IEEE International Symposium on Information Theory (ISIT), page(s) (2014)

[14] **The hard-core model on random graphs revisited** [link]
J. Barbier, F. Krzakala, L. Zdeborová, Pan Zhang International Meeting on “Inference, Computation and Spin Glasses" (ICSG2013), Sapporo, Japan: J. Phys.: Conf. Ser. 473 012021 (2013)

[13] **Performance of simulated annealing in p-spin glasses** [link]
Florent Krzakala, Lenka Zdeborová, International Meeting on "Inference, Computation, and Spin Glasses" (ICSG2013),: J. Phys.: Conf. Ser. 473 012022 (2013)

[12] **Robust error correction for real-valued signals via message-passing decoding and spatial coupling** [link] J. Barbier, F. Krzakala, L. Zdeborová P. Zhang, IEEE Inf. Th. Workshop (ITW ’13)

[11] **Blind Calibration in Compressed Sensing using Message Passing Algorithms** [link]
Christophe Schülke, Francesco Caltagirone, Florent Krzakala, Lenka Zdeborová
Advances in Neural Information Processing Systems 26 (NIPS 2013), pp 566--574 (2013)

[10] **Non-adaptive pooling strategies for detection of rare faulty items** [link]
Pan Zhang, Florent Krzakala, Marc Mézard, Lenka Zdeborová IEEE International Conference on Communications Workshops (ICC 2013), Pages: 1409 - 1414, (2013)

[9] **Phase Diagram and Approximate Message Passing for Blind Calibration and Dictionary Learning** [link] Florent Krzakala, Marc Mézard, Lenka Zdeborová
IEEE International Symposium on Information Theory (ISIT), page(s) 659 - 663 (2013)

[8] **Compressed Sensing under Matrix Uncertainty: Optimum Thresholds and Robust Approximate Message Passing** [link]
Florent Krzakala, Marc Mézard, Lenka Zdeborová Acoustics, Speech and Signal Processing (ICASSP), 2013 IEEE International Conference on, pages 5519 - 5523 (2013)

[7] **Compressed Sensing of Approximately-Sparse Signals: Phase Transitions and Optimal Reconstruction** [link]
Jean Barbier, Florent Krzakala, Marc Mézard, Lenka Zdeborová Communication, Control, and Computing (Allerton), 2012 50th Annual Allerton Conference on , pp.800,807, 1-5 Oct. (2012)

[6] **Quantum Annealing of Hard Problems** [link] T. Jorg, F. Krzakala, J. Kurchan, A. C. Maggs Proceedings of the "YKIS 2009: Frontiers in Non-equilibrium Physics" conference in Kyoto, August 2009. Progress of Theoretical Physics Supplement No. 184 pp. 290-303 (2010)

[5] **Constraint optimization and landscapes[link]**
Jorge Kurchan & Florent Krzakala Contribution to STATPHYS23; Eur. Phys. J. B 64, 563 (2008)

[4] **Phase Transitions and Computational Difficulty in Random Constraint Satisfaction Problems** [link]
Florent Krzakala and Lenka Zdeborová Proceedings of the International Workshop on Statistical-Mechanical Informatics 2007, Kyoto (Japan) J. Phys.: Conf. Ser. 95 012012 (2017)

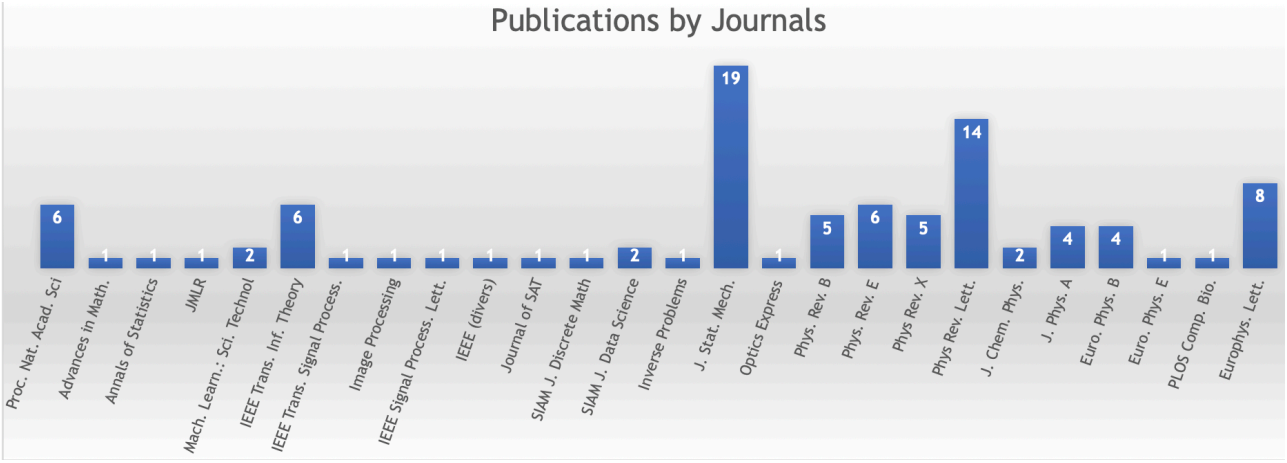
[3] **Aging, memory and rejuvenation: some lessons from simple models** [link]
Florent Krzakala, Federico Ricci-Tersenghi Proceedings of the Summer school "Ageing and the glass transition", Luxembourg 14-25 Sept. 2005 2006 J. Phys.: Conf. Ser. 40 42-49

[2] **How many colors to color a random graph?** [link] F. Krzakala, Proceeding of "Statistical Physics of Disordered Systems and Its Applications", Hayama (Japan), July 2004 Progress of Theoretical Physics Supplement No.157 (2005) pp. 357-360

[1] **Zero temperature phase diagram of finite connectivity spin glasses** [link]
F. Krzakala, Proceeding of "Statistical Physics of Disordered Systems and Its Applications", Hayama (Japan), July 2004, Progress of Theoretical Physics Supplement No.157 (2005) pp. 77-81

- ***Publications in international peer reviewed journals***

As of June '24, I have published 96 papers in international peer reviewed journals in theoretical physics, computer science & applied mathematics:



[96] **On the Atypical Solutions of the Symmetric Binary Perceptron** [link] D. Barbier, A. El Alaoui, FK, F. Zdeborová, J. Phys. A: Mathematical and Theoretical 57.19 (2024):195202

[95] **Sampling with flows, diffusion and autoregressive neural networks: A spin-glass perspective** [link] Davide Ghio, Yatin Dandi, Florent Krzakala, Lenka Zdeborová Proceedings of the National Academy of Sciences 121.27 (2024): e2311810121

[94] **Quenches in the Sherrington-Kirkpatrick model** [link] Vittorio Erba, Freya Behrens, Florent Krzakala, Lenka Zdeborová. J. Stat. Mech. (2024) 083302

[93] **Rigorous dynamical mean field theory for stochastic gradient descent methods**[link] Cedric Gerbelot, Emanuele Troiani, Francesca Mignacco, Florent Krzakala, Lenka Zdeborova, SIAM Journal on Mathematics of Data Science, to appear (2024)

[92] **Statistical mechanics of the maximum-average submatrix problem** [link] V. Erba, FK, R. Pérez, L. Zdeborová, J. Stat. Mech. 2024

[91] **Gaussian Universality of Perceptrons with Random Labels** [link] F. Gerace, FK, B. Loureiro, L. Stephan, L. Zdeborová, Physical Review E 109.3 (2024): 034305

[90] **Bayesian Inference With Nonlinear Generative Models: Comments on Secure Learning** [link] A. Bereyhi, B. Loureiro, FK, R. R. Müller, H. Schulz-Baldes IEEE Transactions on Information Theory 69, (2023)

[89] **Theoretical characterization of uncertainty in high-dimensional linear classification** L. Clarté, B Loureiro, F Krzakala and L. Zdeborová; Mach. Learn.: Sci. Technol. 4 025029 (2023)

[88] **Error scaling laws for kernel classification under source and capacity conditions** H. Cui; B. Loureiro; F. Krzakala; L. Zdeborová, Mach. Learn.: Sci. Technol. 4 035033 (2023)

[87] **Tree-AMP: Compositional Inference with Tree Approximate Message Passing** [link] A. Baker, FK, B. Aubin, L. Zdeborová, Journal of Machine Learning Research 24 (2023) 1-89

[86] **Asymptotic Errors for Teacher-Student Convex Generalized Linear Models (or : How to Prove Kabashima's Replica Formula)** [link] C. Gerbelot, A. Abbara, FK, IEEE Transactions on Information Theory, vol. 69, no. 3, pp. 1824-1852, March 2023

[85] **Bayesian reconstruction of memories stored in neural networks from their connectivity** [link] S. Goldt, FK, L. Zdeborová, N. Brunel, PLOS Computational Biology 19(1): e1010813, 2023

[84] **Perturbative construction of mean-field equations in extensive-rank matrix factorization & denoising** [link] A. Maillard, F. Krzakala, L. Zdeborová, M. Mézard J. Stat. Mech. 2022 083301

[83] **Epidemic mitigation by statistical inference from contact tracing data** [link] A. Baker *et al*., Proc. Nat. Acad. Sci. (2021) Vol. 118 No. 32 e2106548118

[82] **Large-Scale Optical Reservoir Computing for Spatiotemporal Chaotic Systems Prediction** [link] M. Rafayelyan, J. Dong, Y. Tan, F. Krzakala, & S. Gigan Phys. Rev. X 10, 041037 (2020)

[81] **Modeling the influence of data structure on learning in neural networks: The Hidden Manifold Model** [link] S. Goldt, M. Mézard, F. Krzakala, L. Zdeborová, Phys. Rev. X 10 4 (2020)

[80] **Detection limits in the spiked Wigner model** [link] Ahmed El Alaoui, Florent Krzakala, Michael I. Jordan Ann. Statist., 48, 2 (2020), 863-885.

[79] **Mutual Information and Optimality of Approximate Message-Passing in Random Linear Estimation** [link] J. Barbier, N. Macris, M. Dia and F. Krzakala IEEE Transactions on Information Theory, vol. 66, no. 7, pp. 4270-4303 (2020)

[78] **Marvels & Pitfalls of the Langevin Algorithm in Noisy High-dimensional Inference** [link] S. Mannelli, G. Biroli, C. Cammarota, F. Krzakala, P. Urbani, L. Zdeborová Phys. Rev. X **10**, 011057 (2020)

[77] **On the Universality of Noiseless Linear Estimation with Respect to the Measurement Matrix** [link] A. Abbara, A. Baker, F. Krzakala, L. Zdeborová, J. Phys. A: Math. Theor. (2020)

[76] **Optical Reservoir Computing using multiple light scattering for chaotic systems prediction** [link] J. Dong ; M. Rafayelyanment; F. Krzakala ; S. Gigan ; IEEE Journal of Selected Topics in Quantum Electronics, 26, 1(2020)

[75] **The committee machine: Computational to statistical gaps in learning a two-layers neural network** [link] B. Aubin, A. Maillard, J. Barbier, F. Krzakala, N. Macris L. Zdeborová J. Stat. Mech. (2019) 124023

[74] **Entropy and mutual information in models of deep neural networks,** [link] M. Gabrié, A. Manoel, C. Luneau, J. Barbier, N. Macris, F. Krzakala, L. Zdeborová J. Stat. Mech. (2019) 124014

[73] **High-temperature Expansions and Message Passing Algorithms** [link] A. Maillard, L. Foini, A. Lage Castellanos, F. Krzakala, M. Mézard, L. Zdeborová J. Stat. Mech. (2019) 113301

[72] **Approximate Survey Propagation for Statistical Inference** [link]

F. Antenucci, F. Krzakala, P. Urbani and L. Zdeborová J. Stat. Mech. (2019) 023401

[71] **Decoding from Pooled Data: Sharp Information-Theoretic Bounds** [link]
Ahmed El Alaoui ; Aaditya Ramdas ; Florent Krzakala ; Lenka Zdeborová ; Michael I. Jordan
SIAM Journal on Mathematics of Data Science, 1(1), 161–188. (2019)

[70] **Optimal Errors and Phase Transitions in High-Dimensional Generalized Linear Models** [link] J. Barbier, F. Krzakala, N. Macris, L. Miolane, L. Zdeborová
Proc. Nat. Acad. Sci. (2019) 116 (12) 5451-5460

[69] **Deterministic and generalized framework for unsupervised learning with restricted Boltzmann machines** [link] Eric W. Tramel, Marylou Gabrié, Andre Manoel, Francesco Caltagirone, and Florent Krzakala, Phys. Rev. X 8, 041006 (2018)

[68] **Information-theoretic thresholds from the cavity method** [link]
A. Coja-Oghlan, F. Krzakala, W. Perkins, L. Zdeborová,
Advances in Mathematics Volume 333, 31 July 2018, Pages 694-795 (2018)

[67] **Decoding from Pooled Data: Phase Transitions of Message Passing** [link]
Ahmed El Alaoui ; Aaditya Ramdas ; Florent Krzakala ; Lenka Zdeborová ; Michael I. Jordan
IEEE Transactions on Information Theory, 65 1 (2019)

[66] **Constrained Low-rank Matrix Estimation: Phase Transitions, Approximate Message Passing and Applications** [link] T. Lesieur, FK & L. Zdeborová, J. Stat. Mech. 7 (2017) 073403

[65] **Approximate message-passing decoder and capacity-achieving sparse superposition codes** [link] J. Barbier & F. Krzakala IEEE Transactions on Information Theory, 63, 8 (Aug. 2017)

[64] **Spectral Bounds for the Ising Ferromagnet on an Arbitrary Given Graph** [link]
Alaa Saade, Florent Krzakala, Lenka Zdeborová J. Stat. Mech. 2017 053403

[63] **Performance Limits for Noisy Multi-Measurement Vector Problems** [link]
J. Zhu, D. Baron, F. Krzakala IEEE Transactions on Signal Processing, 65, 9,2444 - 2454 (2017)

[62] **Robust phase retrieval with the swept approximate message passing algorithm** [link]
B. Rajaei, S. Gigan, F. Krzakala, L. Daudet Image Processing On Line, 7 (2017), pp. 43-55

[61] **Fast phase retrieval for high dimensions: A block-based approach** [link]
B. Rajaei, S. Gigan, F. Krzakala, L. Daudet IEEE Signal Processing Letters 23, 1179 - 1182 (2016)

[60] **Phase transitions and sample complexity in Bayes-optimal matrix factorization** [link]
Y. Kabashima, F. Krzakala, M. Mézard, A. Sakata, L. Zdeborová
IEEE Transactions on Information Theory (Volume:62 , Issue: 7, Pages: 4228 - 4265) (2016)

[59] **Approximate Message Passing with Restricted Boltzmann Machine Priors** [link]
E. W. Tramel, A. Drémeau and F. Krzakala J. Stat. Mech. (2016) 073401

[58] **Approximate message-passing with spatially coupled structured operators, with applications to compressed sensing and sparse superposition codes** [link]
J. Barbier, C. Schülke, F. Krzakala J. Stat. Mech. (2015) P05013

[57] **Reference-less measurement of the transmission matrix of a highly scattering material using a DMD and phase retrieval techniques** [link] A. Dremeau, A. Liutkus, D. Martina, O. Katz, C. Schulke, F. Krzakala, S. Gigan, L. Daudet Optics Express Vol. 23, Issue 9, 11898-11911 (2015)

[56] **Belief-Propagation Guided Monte-Carlo Sampling** [link]
A. Decelle & F. Krzakala Phys. Rev. B 89, 214421 (2014)

[55] **Spectral density of the non-backtracking operator** [link]
A. Saade, F. Krzakala & L. Zdeborová 2014 EPL 107 50005

[54] **Reweighted belief propagation and quiet planting for random K-SAT** [link]
F. Krzakala, M. Mézard & L. Zdeborová J. on Satisfiability, Boolean Mod. & Computation 8 (2014)

[53] **Model Selection for Degree-corrected Block Models** X. Yan, C. Rohilla Shalizi, J. E. Jensen, F. Krzakala, C. Moore, L. Zdeborová, P. Zhang, Y. Zhu J. Stat. Mech. (2014) P05007

[52] **Spectral redemption: clustering sparse networks** [link] F. Krzakala, C. Moore, E. Mossel, J. Neeman, A. Sly, F. Zdeborová, P. Zhang Proc. of the Nat. Academy of Sciences 110, no. 52 (2013)

[51] **Belief Propagation Reconstruction for Discrete Tomography** [link]
E. Gouillart, F. Krzakala, M. Mezard & L. Zdeborová Inverse Problems 29, 3 (2013) 035003

[50] **Fragility and hysteretic creep in frictional granular jamming** [link]
M. M. Bandi, M. K. Rivera, F. Krzakala, R. E. Ecke Phys. Rev. E 87, 042205 (2013)

[49] **Ultrametric probe of the spin-glass state in a field** [link]
H. G. Katzgraber, T. Jorg, F. Krzakala, A. K. Hartmann Phys. Rev. B 86, 184405 (2012)

[48] **Comparative Study for Inference of Hidden Classes in Stochastic Block Models** [link]
P. Zhang, F. Krzakala, J. Reichardt & L. Zdeborová J. Stat. Mech. (2012) P12021

[47] **Probabilistic Reconstruction in Compressed Sensing: Algorithms, Phase Diagrams, and Threshold Achieving Matrices** [link]
F. Krzakala, M. Mézard, F. Sausset, Y. Sun, L. Zdeborová J. Stat. Mech. (2012) P08009

[46] **Statistical physics-based reconstruction in compressed sensing** [link]
F. Krzakala, M. Mézard, F. Sausset, Y. Sun, L. Zdeborová Phys. Rev. X 2, 021005 (2012)

[45] **On the relation between kinetically constrained models of glass dynamics and the random first-order transition theory** [link]
Laura Foini, Florent Krzakala, Francesco Zamponi J. Stat. Mech. (2012) P06013

[44] **Following states in temperature in the spherical s+p-spin glass model** [link]
Y. Sun, A. Crisanti, F. Krzakala, L. Leuzzi, L. Zdeborová J. Stat. Mech. (2012) P07002

[43] **The nature of the different zero-temperature phases in discrete two-dimensional spin glasses: Entropy, universality, chaos and cascades in the renormalization group flow** [link]
Thomas Jörg and Florent Krzakala, J. Stat. Mech. (2012) L01001
Special insight on this paper in J. Phys. A by A. Hartmann [link]

[42] **Asymptotic analysis of the stochastic block model for modular networks and its algorithmic applications** [link]
A. Decelle, F. Krzakala, C. Moore, F. Zdeborová Phys. Rev. E 84, 066106 (2011)

[41] **Phase transition in the detection of modules in sparse networks** [link]
A. Decelle, F. Krzakala, C. Moore, F. Zdeborová Phys. Rev. Lett. 107, 065701 (2011)

[40] **Random-field p-spin glass model on regular random graphs** [link]
Y. Matsuda, H. Nishimori, L. Zdeborová, F. Krzakala J. Phys. A: Math. Theor. 44 (2011) 185002

[39] **Glassy dynamics as a melting process** [link]
F. Krzakala & L. Zdeborová, J J. Chem. Phys. 134, 034513 (2011)

[38] **Glassy aspects of melting dynamics** [link]
F**.** Krzakala & L. Zdeborová, J. Chem. Phys. 134, 034512 (2011)

[37] **No spin glass phase in ferromagnetic random-field random-temperature scalar Ginzburg-Landau model** [link]
F. Krzakala, F. Ricci-Tersenghi, D. Sherrington, L. Zdeborová J. Phys. A:. 44, 042003 (2011)
Special insight on No spin glass phase in the random field Ising model in J. Phys. A [link]

[36] **Quiet Planting in the Locked Constraint Satisfaction Problems** [link]
Lenka Zdeborová, Florent Krzakala SIAM J. Discrete Math. 25, 750-770 (2011)

[35] **First-order transitions and the performance of quantum algorithms in random optimization problems** [link]
T.Jorg, F.Krzakala, G.Semerjian, F.Zamponi Phys. Rev. Lett. 104, 207206 (2010)

[34] **Following Gibbs States Adiabatically - The Energy Landscape of Mean Field Glassy Systems** [link] F. Krzakala & L. Zdeborová 2010 EPL 90 66002

[33] **Inference in particle tracking experiments by passing messages between images** [link] M. Chertkov, L. Kroc, F. Krzakala, M. Vergassola, L. Zdeborová Proc. Nat. Acad. Sci. 107:7663,2010

[32] **Elusive Glassy Phase in the Random Field Ising Model** [link]
F. Krzakala, F. Ricci-Tersenghi, D. Sherrington, L. Zdeborová Phys. Rev. Lett. 104, 207208 (2010)

[31] **Generalization of the cavity method for adiabatic evolution of Gibbs states** [link]
Lenka Zdeborová and Florent Krzakala Phys. Rev. B 81, 224205 (2010)
Editors' Suggestion in Phys. Rev. B

[30] **Energy gaps in quantum first-order mean-field-like transitions: The problems that quantum annealing cannot solve** [link]

T. Jorg, F. Krzakala, J. Kurchan, A. C. Maggs, J. Pujos EPL, 89 (2010) 40004

[29] **Hiding Quiet Solutions in Random Constraint Satisfaction Problems** [link]
Lenka Zdeborová and Florent Krzakala Phys. Rev. Lett. 102, 238701 (2009)

[28] **Jamming versus Glass Transitions** [link]
Romain Mari, Florent Krzakala, and Jorge Kurchan Phys. Rev. Lett. 103, 025701(2009)

[27] **On the path integral representation for quantum spin models and its application to the quantum cavity method and to Monte Carlo simulations** [link]
F. Krzakala, A. Rosso, G. Semerjian, F. Zamponi Phys. Rev. B 78, 134428 (2008)

[26] **A Lattice Model for Colloidal Gels and Glasses** [link]
Florent Krzakala, Marco Tarzia, Lenka Zdeborová Phys. Rev. Lett. 101, 165702 (2008)

[25] **Simple Glass Models and their Quantum Annealing** [link]
Thomas Jorg, Florent Krzakala, Jorge Kurchan, A. C. Maggs Phys. Rev. Lett. 101, 147204 (2008)

[24] **Behavior of Ising Spin Glasses in a Magnetic Field** [link]
Thomas Jorg, Helmut G. Katzgraber, Florent Krzakala Phys. Rev. Lett. 100, 197202 (2008)

[23] **Potts Glass on Random Graphs** [link]
Florent Krzakala & Lenka Zdeborová EPL, 81 (2008) 57005

[22] **Comment on « Ultrametricity in the Edwards-Anderson Model »** [link]
Thomas Jorg, Florent Krzakala Phys. Rev. Lett. 100, 159701 (2008)

[21] **Phase Transitions in the Coloring of Random Graphs** [link]
Lenka Zdeborová and Florent Krzakala Phys. Rev. E 76, 031131 (2007)

[20] **A Landscape Analysis of Constraint Satisfaction Problems** [link]
Florent Krzakala and Jorge Kurchan Phys. Rev. E 76, 021122 (2007)

[19] **Gibbs States and the Set of Solutions of Random Constraint Satisfaction Problems** [link]
F. Krzakala, A. Montanari, F. Ricci-Tersenghi, G. Semerjian, L. Zdeborová
Proc. Natl. Acad. Sci. 104, 10318 (2007)

[18] **Temperature and Disorder Chaos in Three-Dimensional Ising Spin Glasses** [link]
Helmut G. Katzgraber, Florent Krzakala Phys. Rev. Lett. 98, 017201 (2007)

[17] **Critical aging of Ising ferromagnets relaxing from an ordered state** [link]
P. Calabrese, A. Gambassi, F. Krzakala J.Stat.Mech.0606:P06016,2006

[16] **Disorder chaos in spin glasses** [link]
F. Krzakala and J.P. Bouchaud Europhys. Lett., 72 (3), pp. 472-478 (2005)

[15] **Spin glass models with ferromagnetically biased couplings on the Bethe lattice: analytic solutions and numerical simulations** [link]
Tommaso Castellani, Florent Krzakala, Federico Ricci-Tersenghi. Eur. Phys. J. B 47, 99 (2005)

[14] **Glassy properties of the Kawasaki dynamics of two-dimensional ferromagnets** [link]
Florent Krzakala Phys. Rev. Lett. 94, 077204 (2005)

[13] **Threshold values, stability analysis and high-q asymptotics for the coloring problem on random graphs** [link]
Florent Krzakala, Andrea Pagnani, Martin Weigt Phys. Rev. E 70, 046705 (2004)

[12] **Nonequilibrium critical dynamics of the ferromagnetic Ising model with Kawasaki dynamics** [link]
C. Godreche, F. Krzakala & F. Ricci-Tersenghi J.Stat. Mech.: Theor. Exp. (2004) P04007

[11] **On temperature chaos in Ising and XY Spin Glasses** [link]
Florent Krzakala Europhys. Lett., 66 (6), pp. 847-853 (2004)

[10] **Energy exponents and corrections to scaling in Ising spin glasses** [link]
J.-P. Bouchaud, F. Krzakala, O.C. Martin Phys. Rev. B 68, 224404 (2003)

[9] **Local excitations in mean field spin glasses** [link]
F. Krzakala and G. Parisi Europhys. Lett., 66 (5), pp. 729-735 (2004)

[8] **Absence of an equilibrium ferromagnetic spin glass phase in three dimensions** [link]
F. Krzakala, O.C. Martin Phys. Rev. Lett. 89, 267202 (2002)
[7] **The secondary structure of RNA under tension** [link]
M. Mueller, F. Krzakala, M. Mezard Eur. Phys. J. E 9, 67-77 (2002)

[6] **Chaotic temperature dependence in a model of spin glasses** [link]
F. Krzakala, O.C. Martin Eur. Phys. J. B 28, 199-209 (2002)

[5] **Nature of the glassy phase of RNA secondary structure** [link]
F. Krzakala, M. Mezard, M. Mueller Europhys. Lett., 57 (5), pp. 752-758 (2002)

[4] **Zero-temperature responses of a 3D spin glass in a field** [link]
F. Krzakala, J. Houdayer, E. Marinari, O.C. Martin, G. Parisi Phys. Rev. Lett. 87, 197204 (2001)

[3] **Discrete energy landscapes and replica symmetry breaking at zero temperature** [link]
F. Krzakala, O.C. Martin Europhysics Letters 53 (6) (2001) 749-755

[2] **Large-scale low-energy excitations in 3-d spin glasses** [link]
J. Houdayer, F. Krzakala, O. C. Martin Eur. Phys. J. B 18, 467-477 (2000)

[1] **Spin and link overlaps in 3-dimensional spin glasses** [link]
F. Krzakala, O.C. Martin Phys. Rev. Lett. 85, 3013 (2000)

- ***Patent***

F. Krzakala, S.Gigan, L. Daudet, Laurent, I. Carron, A. Drémeau, A. Saade
« Digital-data mixing apparatus and digital data processing system »
European Patent application **EP15305165** [link]

List of seminars and conferences (more or less complete)

2024

Rocella Ionica, Italy, August *invited talk* at the workshop "Rock'in AI" **[link]**
Cargese, Corsica, July *invited talk* at the school "Complex & Glassy Systems" **[link]**
Cargese, Corsica, July *general public talk* **[link]**
Bocconi, Milan, May *invited talk* at the workshop *Conceptual Challenges in AI* **[link]**
ENS Paris, March *invited seminar* at the Ecole Normale Superieure, CDS
Banff, Feb. *invited talk* @ the workshop Computational Complexity of Statistical Inference **[link]**

2023

New Orleans, December, NEURIPS, *invited talk @ Mathematics of Deep learning workshop*
Porquerolle (France), June**,** *invited talk @ High-dimensional Statistics and Random Matrix*
Harvard (US), May**,** *invited talk @ GRAMSIA*
Princeton (USA), April, ***Invited speaker*** at Physics for Neural Networks **[link]**
NYU Courant (NY USA), April, ***Invited talk***
Oberwolfach (Germany), March, ***Invited speaker*** at Random Graphs: Combinatorics, Complex Networks and Disordered Systems **[link]**
Les Houches (France), February, ***Invited speaker*** at statphysneuros2023 **[link]**
UNL London (France), September, ***Invited lecturer*** @ Analytical Connectionism 2023 **[link]**

2022

Erice (Italy), January, *Invited* ***keynote*** at MECO47
Harvard May *(by zoom)*, ***Invited talk***
Cortona (Italy), April, *Invited lecturer* @ School of Mathematics of Spin Glasses, Cortona
Paris, January, *Invited talk* at Systèmes Aléatoires Inhomogènes. Institut Henry Pointcaré, France

2021

Bielefeld August, Conference on Mathematics of deep learning, ZIF, Germany
Rice, April, Workshop on the Theory of Overparameterized Machine Learning *(zoom)* [video]
Paris March, *invited talk* at in Lagrange Mathematics and Computation Research Center *(zoom)*
New York February, *invited talk* at NYU/Simons institute *(zoom)*

2020

NeurIPS'20, Vancouver, December, six papers, including an *oral presentation*
Harvard November *(by zoom)*, *invited talk* @ New Technologies in Mathematics Seminar [video]
Lisbon October *(by zoom)*, *invited talk* @ Seminar in Math., Physics & Machine Learning [video]
Berkeley September *(by zoom)*, International Semester on Probability, Geometry, and Computation in High Dimensions, *invited talk*
Berkeley September *(by zoom)*, International Semester on Probability, Geometry, and Computation in High Dimensions, set of lecture "Statistical Physics and Computation in High Dimension".
Les Houches August, set of lecture @ school Statistical Physics & Machine Learning [video]
Lausanne February, colloquium of the EE department in EPFL
London, January, *invited talk* @ Alan Turing Institute Statistics and computation [video]

2019

NeurIPS'19, Vancouver, *Invited talk @ the workshop on "Deep learning & Engineering"* [video]
NeurIPS'19, Vancouver, December, three papers with *oral & spotlight presentations*
Lausanne November, colloquium of the IC department in EPFL
Paris November, French-German conference in AI
San Sebastian September, *seminar* for in the ELLIS meeting on machine learning
Istanbul July, *seminar* in the Workshop on Theoretical Advances in Deep Learning.
Lausanne June, *seminar* for the 'theory of neural network' group in EPFL
New York April, *invited talk* at the Flatiron institute [video]

Les Houches March, *invited talk* at the 4th *Optimization & Statistical Learning* workshop.
Duke University March, *seminar* at the physics department
New York March, *seminar* @ MaD seminar, NYU Center of Datascience
Santa Barbara February, *invited talk* at the KITP institute [video]
Santa Barbara January, *talk* at the KITP institute [video]

2018

NeurIPS'18, Montreal, December, two papers with both *spotlight presentations*
Trieste, October *invited seminar* at SISSA
Rome, September *invited seminar* at workshop in honour of Giorgio Parisi's birthday
Banff (Canada), *invited talk* at the workshop Spin glass and related topic
Montreal ICMP August *invited talk* at the International Conference on Mathematical Physics
Lausanne June, *invited lecture* @ ***Bernoulli institute*** *EPFL "Applications of partition function"*
Beg ROHU *invited lecture* @ summer school on Statistical Physics of Machine Learning
STOC'18, LA (USA): *invited talk* @ Workshop *Comput. Threshold for Average-Case Problems*
London, *invited talk* @ Workshop on applied machine learning, Imperial College
Florence, *invited talk* @ Workshop on Computational Pptics
Paris *invited talk* at workshop Wendy in IHP
Duke Lectures series *Statistical physics of Learning* @ Duke University, USA [course link]

2017

Boulder (CO USA), August Lectures series *Statistical mechanics, Glasses & Inference* [video link]
Lausanne, September Lectures series *Physics, Statistics & Machine Learning* @ EPFL
San Jose (USA) June, *workshop at the American institute of mathematics*
Berkeley (USA) June, *invited talk* @ Simons Institute.
Kyoto (Japan), September, *invited talk @ workshop*
Paris March, *invited seminar* for the Smile group
San Diego (USA) February *Talk* at Information Theory and Application workshop
Bangalore (India) **Lectures series** *Statistical physics of Learning* [course link]

2016

NeurIPS'16, Barcelona, December, one paper presented
Duke November Two *invited seminars* at Duke University, Durham
Cambridge September, *talk* at the ITW 2016 conference
Aalborg (Danemark) July, *invited Keynote Talk* at **ITWIST2016** [link]
Frankfurt July, *invited talk* @ " Phase transitions in discrete structures" Goethe University.
Paris July, *invited talk* at the "Journees Claude Shannon" at LINCS
Paris May, *invited talk* @ IHP/Microsoft Workshop on *Community detection & Phase Transitions*"
Berkeley (USA) May, *invited talk* "Random phase transitions"workshop @ Simons Institute. **[link]**
NASA (USA) April 2016 seminar in the quantum theory group in Montain View.
San Diego (USA) February *Talk* at Information Theory and Application workshop
Berkeley (USA) January *invited talk* at the Bootcamp on "phase transitions" @ Simons Institute.

2015

NIPS 2015, Montreal December**,** one paper presented
Lyon GRESTSI, September ***invited plenary*** *Talk* in Lyon. **[video link]**
Cargese (Corsica) September, 2H *invited lecture* at school on random graphes.
Harvard (USA) August, *invited talk* at the Conference on Big Data**[video link]**
Les Houches (France) June, *12H invited lecture* at Physics school of Les Houches, for the International Doctoral Training in Statistical Physics 2015
Trieste (Italy) June, *10H invited lecture* at the International Centre for Theoretical Physics, for the Spring College on the Physics of Complex Systems 2015
Paris ENS May, *seminar* in the DI (computer Science department).
Cargese (France) May, *invited seminar* at the workshop "Wave physics"
Paris (IT) February, *invited talk* at the IHP Workshop "Community detection"
Berkeley (USA) February, *invited talk* at the Workshop "Coding theory" @ Simons Institute
Bardinecchia (IT) February, *invited talk* at the Workshop "Biological network" Paris (IT)

2014

NIPS 2014, Montreal December**,** one paper presented
Paris November, ***invited talk*** **at the IHP Workshop "random matrices"**
MIT (USA) August, *seminar*
Boston (USA Juin, *talk* at the CCP 2014 conference
Honolulu (USA June, *talk* at the ISIT 2014 conference
Warwick (UK) May, *invited talk* Phase trans. in discr. structures & comp. problems @EPSRC
Paris March , *seminar* at Ecole Centrale.

2013

NIPS 2013, lake Tahoe December**,** one paper presented
Paris November, *seminar* at the APC, Paris
Paris November, *invited talk* at the GDR Phenix-ISIS
Gottingen November, *invited talk* at the Workshop "Compressive Sensing"
Sevilla September, *talk* at the ITW 2013 conference
Sappuro, Japan, July, *invited talk* at "Inference, Computation, and Spin Glasses"
Seoul, Korea, July, *talk* at the STATPHYS 25 conference
Lausanne June, *talk* at the SPARS2013 conference in EPFL
Vancouver May, *talk* at the ICASSP 2013 conference
New york May, *seminar* at the physics institute in NYU.

2012

Paris December, talk at the Tomographic Reconstruction Workshop in Paris
Paris November, seminar at the institut de Simulation de Jussieu.
Oldenburg (Germany) November, seminar in the physics department.
Rennes November, seminar in INRIA.
Allerton October, talk at the 50th Conference on Communication, Control, and Comp..
Aspen (CO USA), August, Workshop in the Center of Physics. seminar
Los Alamos (NM USA), August, seminar: Colloquium CNLS in Los Alamos LANL
Paris (France), Juin, invited public talk at the Journ´ees "Complexit´e/d´esordre".
Paris (France)), Juin, invited talk at Interdisciplinary Workshop on Inference.
Paris (France), Juin, seminar at Capital Fund Management.
Paris (France), May, invited talk in IHP Disordered Quantum Systems meeting.
Nancy (France), May, invited talk at SPLDS 2012.
Philips Research (France), April, seminar at the Suresnes department.
Lyon (France),March, seminar at the ENS Lyon.
Saclay (France),March, seminar at the Service of Astrophysics.
Saclay (France),January, seminar Triangle de la physique.

2011

Paris (France), December, *invited talk* at Unifying concept in glass physics IV.
Paris (France),November, *seminar* at ESPCI.
Rome (Italy), March, *seminar* at University of Roma La Sapienza.
Bardonecchia (Italy) Feb., *invited talk* workshop Stat. phys. complexity, opti. & systems biology.

2010

Tokyo, November, *invited talk* at the workshop on complex system in Tokyo.
Harvard (USA), October, *seminar* Squishy Physics talks.
Orsay September, workshop on Statistical physics, complexity, opt. & biological information, talk.
Hong Kong, July, STATPHYS 25: Complexity, Computation and Information, *talk*.
Beijing(China), July, Beihang University, *invited seminar.*
Beijing(China), July, STATPHYS 24 Satellite : Statistical Physics & Computer Science, i*nvited talk*
Trieste ICTP, June, *invited talk @* Workshop Quantum Stat. Mech. Computation & Information
Saclay (France) , Mai, Ipht, groupe des systemes vitreux *seminar*.
Los Alamos (NM USA), April, Condensed matter group *seminar*.
Los Alamos (NM USA), April Quantum lunch *seminar*.

2009

Trieste ICTP, November *seminar* in the Statistical Physics Group.
Barcelona, October, *invited talk* @ Workshop on Tech. & Challenges from Statistical Physics
Chicago (USA), October, seminar in the center of physics.
Santa Fe (NM USA), September, *invited talk* @ conference of "Physics of algorithms".
Los Alamos (NM USA), April, seminar in (CNLS) Los Alamos Nat. Lab.
MIT Cambridge (USA), February, visiting scientist in the Cent. Theor. Physics
Amherst (USA), February, seminar in the Theoritical physics department

2008

Kyoto (Japan), November 2008, *invited talk* at the Unifying concept in glass physics.
Kyoto (Japan), November 2008, *talk* in the French-Japan meeting at the Yukawa Institute.
Los Alamos (NM USA), October 2008, *seminar* in Los Alamos Nat. Lab.
Santa Fe (NM USA), October 2008, *seminar* in the Santa Fe Institute.
Princeton (NJ USA), October 2008, *seminar* in the center of physics
Rutgers University (NJ USA), October 2008, *invited talk* in the DIMACS workshop.
Los Alamos (NM USA), October 2008, *seminar* in Los Alamos Nat. Lab.
Aspen (CO USA), June 2008, Workshop in the Center of Physics.
Los Alamos (NM USA), May 2008, *seminar* in Los Alamos Nat. Lab.
Stockholm(Sweden), May 2008, Workshop on Physics and Computation, *invited talk.*
Beijing(China), March 2008, Workshop on Collective Dynamics of info. System, *invited lecture.*

2007

Braga(Portugal), November 2007, Workshop on complex network, invited talk. Kyoto(Japan),
Kyoto September 2007, International Workshop on Statistical-Mechanical Informatics, invited talk.
Genova, July 2007, STATPHYS 23, poster
Paris, June 2007, Summer school on Spin Glasses 2007, invited lecture.
Zurich, April 2007, ETH Theory Seminar.
Lyon, March 2007, seminar at ENS.
Paris, January 2007, Journees de Physique Statistique 2007, at ESPCI, talk.
Torino, Januray 2007, seminar in the at ISI.

2006

Koln, July 2006, seminar in the physics department.
Paris, January 2006, Journées de Physique Statistique 2006, at ESPCI, talk.

2005

Lyon, Novermber 2005, CECAM Tutorial on polymers and colloids
Luxembourg, September 2005, School on aging and glassy dynamics, talk+proceedings.
Leuven, ITF, September 2005, Random Graph 2005, invited talk.
Lyon, CECAM, April 2005, Conference on Monte-Carlo Methods, talk.
Roma, Universita La Sapienza, March 2005, seminar.
Les Houches, February 2005 Winter School on complex system.

2004

Trieste (Italie), september 2004 Complex system meeting, *talk*.
Tokyo (Japan), July 2004 STATPHYS22 Satelite meeting, *talk*.
Bangalore (India), June 2004 Unifying concept in glass physics *invited talk*.
Nancy, May 2004 Workshop on Ageing and slow dynamics, *talk*.
Paris, May 2004, *seminar* at ESPCI PCT.
Rome, La Sapienza, March 2004, *seminar*.
Paris, Saclay, CEA Spht, January 2004, CEA Spht, *seminar*.
Paris, Orsay, LPT, January 2004, LPT and LPTMS, *seminar*.

2003

Cagliari (Italia), September, General SPHINX Meeting, *talk*.
Salerno, May, Physics department, *seminar*.
Paris, LPTL, May, *seminar*.
Napoli, April, Physics department, *seminar*.
Saarbrucken, MECO 28, March, *talk*.
Montpellier, March, *seminar* at laboratoire des verres.
Les Houches, March School on complexity, *talk*.

2002

Rome Complexity meeting, September, poster.
Marseille JMC8, August Journées de la matière condensée, *talk*.
Les Houches, July Summer school on theoritical physics of aging, *poster+proceedings* [link].
Rome SMC, February Unifying concept in glass physics II, *poster*.
Paris, February, *seminar* at ESPCI PCT.
Paris, January, Journees de Physique Statistique 2002, at ESPCI, *talk*.

2001

Barcelona, December 2001, *seminar* at Departament de Fisica Fonamental.
Orsay, September 2001, *seminar* at LPTMS.
Il Ciocco (Italia), September 2001, General SPHINX Meeting, *talk*.
Montpellier, January 2001, Structure et Dynamique des systèmes désordonnés

XXth century

Saclay, June 2000, The Fifth Claude Itzykson Meeting, *poster*.
Orsay, April 2000, *seminar* at LPTMS, Orsay
Nancy, February 2000, 25 MECO Meeting, *poster*.
Paris, February 2000, Journées de physique statistique 2000, *talk*.
Trieste ICTP, September 1999 Unifying concept in glass physics, participant