

Lenka Zdeborová

Born: 24. 11. 1980 in Plzeň (Czech Republic)
Nationality: Czech
Languages: Czech native speaker, fluent in English and French
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Principal research expertise

Statistical physics and its applications in computer science and technology. Phase transitions and algorithmic hardness in optimization, statistical inference, machine learning and signal processing problems. Message passing algorithms. Physics of systems with glassy behavior. Physics of algorithms on random structures.

Education and employment

- **CNRS Researcher** since October 2010; Institut de Physique Théorique, CEA, Saclay, France.
- **Scholar** in Simons Inst. for the Theory of Computing, **UC Berkeley**, U.S.A., Jan-May 2016.
- **Habilitation à diriger des recherches**, Nov 2015, École Normale Supérieure, Paris, France.
- **Director's Postdoctoral Fellow** August 2008 - October 2010; Center for Nonlinear Studies and the Theoretical Division T-4, Los Alamos National Laboratory, U.S.A.
- **Ph.D.** in physics “en cotutelle”, 2005-2008. Université Paris-Sud XI, Laboratoire de physique théorique et modèles statistiques, Orsay, France.. PhD thesis supervisor Marc Mézard. Graduated with honors “trés honorable” on June 20, 2008.
- **Ph.D.** in physics “en cotutelle”, 2004-2008. Faculty of Mathematics and Physics, Charles University, Prague, Czech Rep. Supervisor Václav Janiš. Graduated on June 20, 2008.
- Young researcher, April 2003 - September 2005. Department of Condensed Matter Theory, Institute of Physics, Academy of Sciences of the Czech Republic.
- **Master** in physics, 1999-2004. Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic. All exams passed with grade A, merit scholarship awarded every year, diploma thesis supervisor Václav Janiš. Graduated with honors on June 3, 2004.

Awards, competitions, fellowships

- **ERC Starting Grant 2016** on Statistical Mechanics of Learning (SMiLe).
- **Philippe Meyer prize** in theoretical physics awarded by ENS Paris, in 2016.
- **Bronze medal of CNRS**, in 2014.
- **V. Votruba Prize** for the best thesis in theoretical physics, awarded by the Ch. Doppler Institute of the Czech Technical University in Prague, November 2008.
- **Director's postdoctoral fellowship** of the Los Alamos National Laboratory, May 2008.
- **Scholarship of the French government** for Ph.D. “en cotutelle”, June 2005.
- **McKinsey company scholarship** for students from Czech technical Universities, June 2004.
- **Award Praemium Bohemiae** for success at the olympiad in physics, December 2001.

- **Honorable mention of the Ministry of Education** of Czech Republic in recognition of high score at the international olympiad in physics, November 1999.
- **Bronze medal at the International Physics Olympiad**, Padova, Italy, July 1999.

Research publications

Preprints

- J. Barbier, F. Krzakala, N. Macris, L. Miolane, L. Zdeborová, *Phase Transitions, Optimal Errors and Optimality of Message-Passing in Generalized Linear Models*, arXiv:1708.03395.
- M. Gabrié, V. Dani, G. Semerjian, L. Zdeborová, *Phase transitions in the q -coloring of random hypergraphs*, arXiv:1707.01983. Submitted to J. Phys. A.
- A. Manoel, F. Krzakala, E. W. Tramel, L. Zdeborová, *Streaming Bayesian inference: theoretical limits and mini-batch approximate message-passing*, arXiv:1706.00705. Submitted to NIPS 2017.
- A. E. Alaoui, A. Ramdas, F. Krzakala, L. Zdeborová, M. I. Jordan *Decoding from Pooled Data: Sharp Information-Theoretic Bounds* arXiv preprint arXiv:1611.09981. Submitted.
- A. Saade, F. Krzakala, M. Lelarge, L. Zdeborová, *Fast Randomized Semi-Supervised Clustering*, arXiv:1605.06422.
- F. Caltagirone, L. Zdeborová, *Properties of spatial coupling in compressed sensing*, arXiv:1401.6380.

In refereed journals

- T. Lesieur, F. Krzakala, L. Zdeborová, *Constrained Low-rank Matrix Estimation: Phase Transitions, Approximate Message Passing and Applications*, J. Stat. Mech.: Th. and Exp. (2017), n. 7, 073403.
- A. Saade, F. Krzakala, L. Zdeborová, *Spectral bounds for the Ising ferromagnet on an arbitrary given graph*, J. Stat. Mech.: Th. and Exp. (2017), n. 5, 053403.
- L. Zdeborová, P. Zhang, H.-J. Zhou, *Fast and simple decycling and dismantling of networks*, Scientific Reports (2016), n. 6, 37954.
- C. Schülke, P. Schniter, L. Zdeborová, *Phase diagram of matrix compressed sensing*, Physical Review E 94 (2016), 062136.
- A. Braunstein, L. Dall'Asta, G. Semerjian, L. Zdeborová, *Network dismantling*, Proc. Nat. Acad. Sci. 113, 44 (2016): 12368-12373.
- C. Schmidt, N.-E. Guenther, L. Zdeborová, *Circular Coloring of Random Graphs: Statistical Physics Investigation*, J. Stat. Mech.: Th. and Exp. (2016), n. 8, 083303.
- A. Braunstein, L. Dall'Asta, G. Semerjian, L. Zdeborová, *The large deviations of the whitening process in random constraint satisfaction problems*, J. Stat. Mech.: Th. and Exp. (2016), n. 5, 053401.
- Y. Kabashima, F. Krzakala, M. Mézard, A. Sakata, L. Zdeborová, *Phase transitions and sample complexity in Bayes-optimal matrix factorization*, IEEE Transactions on Information Theory 62, 4228 - 4265 (2016).
- C. Schülke, F. Caltagirone, L. Zdeborová, *Blind Sensor Calibration using Approximate Message Passing*, J. Stat. Mech (2015): P11013.
- A. Y. Lokhov, M. Mézard, L. Zdeborová, *Dynamic message-passing equations for models with unidirectional dynamics*, Physical Review E 91 (1), 012811 (2015).

- B. Karrer, M. E. J. Newman, L. Zdeborová, *Percolation on sparse networks*, Phys. Rev. Lett. 113 (20), 208702 (2014).
- P. Zhang, C. Moore, L. Zdeborová, *Phase transitions in semisupervised clustering of sparse networks*, Physical Review E 90 (5), 052802 (2014).
- Y. Xu, Y. Kabashima, L. Zdeborová, *Bayesian signal reconstruction for 1-bit compressed sensing*, J. Stat. Mech.: Th. and Exp. P11015 (2014).
- A. Saade, F. Krzakala, L. Zdeborová, *Spectral density of the non-backtracking operator*, EPL (Europhysics Letters) 107 (5), 50005 (2014).
- F. Krzakala, M. Mézard, L. Zdeborová, *Reweighted belief propagation and quiet planting for random K-SAT*, Journal on Satisfiability, Boolean Modeling and Computation 8, 149-171 (2014).
- F. Caltagirone, S. Franz, R. Morris, L. Zdeborová, *Dynamics and termination cost of spatially coupled mean-field models*, Phys. Rev. E 89, 012102 (2014).
- A. Y. Lokhov, M. Mézard, H. Ohta, L. Zdeborová *Inferring the origin of an epidemic with dynamic message-passing algorithm*, Phys. Rev. E 90, 012801 (2014).
- X. Yan, J. E. Jensen, F. Krzakala, C. Moore, C. R. Shalizi, L. Zdeborová, P. Zhang, Y. Zhu *Model Selection for Degree-corrected Block Models*, J. Stat. Mech. P05007 (2014).
- F. Krzakala, C. Moore, E. Mossel, J. Neeman, A. Sly, L. Zdeborová, P. Zhang, *Spectral redemption: clustering sparse networks*, Proc. Natl. Acad. Sci. 110, 20935 (2013).
- E. Gouillart, F. Krzakala, M. Mézard, L. Zdeborová, *Belief Propagation Reconstruction for Discrete Tomography*, Inverse Problems 29 (3), 035003 (2013).
- P. Zhang, F. Krzakala, J. Reichardt, L. Zdeborová, *Comparative Study for Inference of Hidden Classes in Stochastic Block Models*, J. Stat. Mech. (2012) P12021; Proc. of AIGM12 workshop.
- F. Krzakala, M. Mézard, F. Sausset, Y. Sun, L. Zdeborová, *Probabilistic Reconstruction in Compressed Sensing: Algorithms, Phase Diagrams, and Threshold Achieving Matrices* J. Stat. Mech. P08009 (2012).
- Y. Sun, A. Crisanti, F. Krzakala, L. Leuzzi, L. Zdeborová, *Following states in temperature in the spherical $s+p$ -spin glass model*, J. Stat. Mech. P07002 (2012).
- F. Krzakala, M. Mézard, F. Sausset, Y. Sun, L. Zdeborová, *Statistical physics-based reconstruction in compressed sensing*, Phys. Rev. X 2, 021005 (2012). Featured in La Recherche n461.
- P. Zhang, A. Ramezanpour, L. Zdeborová, R. Zecchina, *Message passing for quantified Boolean formulas*, J. Stat. Mech. P05025 (2012).
- A. Decelle, F. Krzakala, C. Moore, L. Zdeborová, *Asymptotic analysis of the stochastic block model for modular networks and its algorithmic applications*, Phys. Rev. E, 84, 066106 (2011).
- A. Decelle, F. Krzakala, C. Moore, L. Zdeborová, *Phase transition in the detection of modules in sparse networks*, Phys. Rev. Lett. 107, 065701 (2011).
- Y. Matsuda, H. Nishimori, L. Zdeborová, F. Krzakala, *Random-field p -spin glass model on regular random graphs*, J. Phys. A: Math. Theor. 44 185002 (2011).
- M. Castellana, L. Zdeborová, *Adversarial Satisfiability Problem*, J. Stat. Mech. (2011) P03023.

- F. Krzakala, F. Ricci-Tersenghi, D. Sherrington, L. Zdeborová, *No spin glass phase in ferromagnetic random-field random-temperature scalar Ginzburg-Landau model*, selected for Fast Track Communication in J. Phys. A: Math. Theor. 44, 042003 (2011)
- F. Krzakala, L. Zdeborová, *On melting dynamics and the glass transition. II. Glassy dynamics as a melting process*, J. Chem. Phys. 134, 034513 (2011).
- F. Krzakala, L. Zdeborová, *On melting dynamics and the glass transition. I. Glassy aspects of melting dynamics*, J. Chem. Phys. 134, 034512 (2011).
- L. Zdeborová, F. Krzakala, *Quiet Planting in the Locked Constraint Satisfaction Problems*, SIAM J. Discrete Math. 25, 750-770 (2011).
- F. Krzakala, L. Zdeborová, *Following Gibbs States – The Energy Landscape of Mean Field Glassy Systems*, EPL 90, 66002 (2010).
- P. Šulc, L. Zdeborová, *Belief propagation for graph partitioning*, J. Phys. A: Math. Theor. 43 (2010) 285003.
- L. Zdeborová, F. Krzakala, *Generalization of the cavity method for adiabatic evolution of Gibbs states*, selected for editor's suggestion in Phys. Rev. B 81, 224205 (2010).
- F. Krzakala, F. Ricci-Tersenghi, L. Zdeborová, *Elusive Glassy Phase in the Random Field Ising Model*, Phys. Rev. Lett. 104, 207208 (2010).
- M. Chertkov, L. Kroc, F. Krzakala, M. Vergassola, L. Zdeborová, *Tracking particles by passing messages between images*, Proc. Nat. Acad. Sci. 107, 7663 (2010).
- L. Zdeborová, S. Boettcher, *Conjecture on the maximum cut and bisection width in random regular graphs*, J. Stat. Mech. (2010) P02020.
- L. Zdeborová, A. Decelle, M. Chertkov, *Message Passing for Optimization and Control of Power Grid: Toy Model of Distribution with Ancillary Lines*, Phys. Rev. E 80, 046112 (2009).
- F. Krzakala, L. Zdeborová, *Hiding Quiet Solutions in Random Constraint Satisfaction Problems*, Phys. Rev. Lett. 102, 238701 (2009).
- L. Zdeborová, M. Mézard, *Constraint satisfaction problems with isolated solutions are hard*, J. Stat. Mech. (2008) P12004.
- F. Krzakala, M. Tarzia, L. Zdeborová, *A Lattice model for colloidal gels and glasses*, Phys. Rev. Lett. 101, 165702 (2008).
- J. Ardelius, L. Zdeborová, *Exhaustive enumeration unveils clustering and freezing in random 3-SAT*, Phys. Rev. E 78, 040101(R) (2008).
- L. Zdeborová, M. Mézard, *Locked constraint satisfaction problems*, Phys. Rev. Lett. 101, 078702 (2008).
- T. Mora, L. Zdeborová: *Random subcubes as a toy model for constraint satisfaction problems*, J. Stat. Phys. 131, n.6 (2008) 1121-1138.
- F. Krzakala, L. Zdeborová: *Potts Glass on Random Graphs*, Europhys. Lett. 81 57005 (2008).
- L. Zdeborová, F. Krzakala: *Phase transition in the Coloring of Random Graphs*, Phys. Rev. E 76, 031131 (2007).
- J. Raymond, A. Sportiello, L. Zdeborová: *The Phase Diagram of 1-in-3 Satisfiability* Phys. Rev. E 76, 011101 (2007).

- F. Krzakala, A. Montanari, F. Ricci-Tersenghi, G. Semerjian, L. Zdeborová: *Gibbs States and the Set of Solutions of Random Constraint Satisfaction Problems*, Proc. Natl. Acad. Sci. 104, 10318 (2007).
- L. Zdeborová, M. Mézard: *The number of matchings in random graphs*, Journal of Statistical Mechanics: Theory and Experiment, Vol. 2006, No. 05. (May 2006), P05003.
- M. LoebL, L. Zdeborová: *The 3D Dimer and Ising Problems Revisited*, European J. Combinatorics 29 n.4, 966-978 (2008). Thanks to this article **my Erdős number is 2**.
- V. Janiš, L. Zdeborová: *Thermodynamic origin of order parameters in mean-field models of spin glasses*, Physica status solidi (b), Volume 243, Issue 3, 716 - 731 (2006).
- V. Janiš and L. Zdeborová: *Replica trick with real replicas: A way to build in thermodynamic homogeneity*, Progress of Theoretical Physics Supplement No.157 (2005), 99-102.
- D. Rafaja, H. Fuess, D. Šimek, L. Zdeborová and V. Valvoda: *Degradation of periodic multilayers as seen by small-angle X-ray scattering and X-ray diffraction*, J. Phys.: Condens. Matter 14 (2002) 10021-10032.

In refereed computer science conference proceedings

- A. E. Alaoui, A. Ramdas, L. Zdeborová, M. I. Jordan, *Decoding from Pooled Data: Phase Transitions of Message Passing*, IEEE Int. Symposium on Information Theory Proceedings (ISIT) 2017, preprint arXiv:1702.02279.
- T. Lesieur, L. Miolane, M. Lelarge, F. Krzakala, L. Zdeborová, *Statistical and computational phase transitions in spiked tensor estimation*, IEEE Int. Symposium on Information Theory Proceedings (ISIT) 2017, preprint arXiv:1701.08010.
- A. Manoel, F. Krzakala, M. Mézard, L. Zdeborová, *Multi-Layer Generalized Linear Estimation*, IEEE Int. Symposium on Information Theory Proceedings (ISIT) 2017, preprint arXiv:1701.06981.
- A. Coja-Oghlan, F. Krzakala, W. Perkins, L. Zdeborová, *Information-theoretic thresholds from the cavity method*, Proceedings of the 49th Annual ACM SIGACT Symposium on Theory of Computing (STOC) 2017, 146-157, preprint arXiv:1611.00814. Extended version submitted to a journal.
- T. Lesieur, C. De Bacco, J. Banks, F. Krzakala, C. Moore, L. Zdeborová, *Phase transitions and optimal algorithms in high-dimensional Gaussian mixture clustering*, Proc. of 54th Allerton Conf. IEEE (2016), preprint arXiv:1610.02918.
- J. Barbier, M. Dia, N. Macris, F. Krzakala, T. Lesieur, L. Zdeborová, *Mutual information for symmetric rank-one matrix estimation: A proof of the replica formula*, to appear in NIPS 2016, preprint arXiv:1606.04142.
- F. Krzakala, J. Xu, L. Zdeborová *Mutual Information in Rank-One Matrix Estimation*, IEEE Information Theory Workshop (ITW 2016), arXiv:1603.08447
- A. Saade, M. Lelarge, F. Krzakala, L. Zdeborová, *Clustering from Sparse Pairwise Measurements*, IEEE Int. Symposium on Information Theory Proceedings (ISIT 2016), arXiv:1601.06683.
- M C Angelini, F Caltagirone, F Krzakala, L Zdeborová *Spectral Detection on Sparse Hypergraphs*, Proc. of 53th Allerton Conf. IEEE (2015)., preprint arXiv:1507.04113.
- T Lesieur, F Krzakala, L Zdeborová *MMSE of probabilistic low-rank matrix estimation: Universality with respect to the output channel*, Proc. of 53th Allerton Conf. IEEE (2015), preprint arXiv:1507.03857.

- A. Saade, F. Krzakala, L. Zdeborová, *Matrix Completion from Fewer Entries: Spectral Detectability and Rank Estimation*, Advances in Neural Information Processing Systems (NIPS), 1261-1269 (2015), preprint arXiv:1506.03498.
- T Lesieur, F Krzakala, L Zdeborová *Phase Transitions in Sparse PCA*, IEEE International Symposium on Information Theory Proceedings (ISIT 2015), preprint arXiv:1503.00338.
- A Saade, F Krzakala, M Lelarge, L Zdeborová *Spectral Detection in the Censored Block Model*, IEEE Int. Symp. on Information Theory Proceedings (ISIT 2015), preprint arXiv:1502.00163.
- J Vila, P Schniter, S Rangan, F Krzakala, L Zdeborová, *Adaptive Damping and Mean Removal for the Generalized Approximate Message Passing Algorithm* IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2015), preprint arXiv:1412.2005
- A. Manoel, F. Krzakala, E. W. Tramel, L. Zdeborová, *Sparse Estimation with the Swept Approximated Message-Passing Algorithm*, International Conference on Machine Learning (ICML 2015), arXiv:1406.4311.
- A. Saade, F. Krzakala, L. Zdeborová, *Spectral Clustering of Graphs with the Bethe Hessian*, Advances in Neural Information Processing Systems (NIPS), 406-414 (2014).
- F. Caltagirone, F. Krzakala, L. Zdeborová, *On Convergence of Approximate Message Passing*, IEEE International Symposium on Information Theory Proceedings (ISIT), 1812-1816 (2014).
- F. Krzakala, A. Manoel, E. W. Tramel, L. Zdeborová, *Variational Free Energies for Compressed Sensing*, IEEE International Symposium on Information Theory Proceedings (ISIT), 1499-1503 (2014).
- C. Schülke, F. Caltagirone, F. Krzakala, L. Zdeborová *Blind Calibration in Compressed Sensing using Message Passing Algorithms*, Advances in Neural Information Processing Systems (NIPS), 566-574 (2014).
- J. Barbier, F. Krzakala, L. Zdeborová, P. Zhang, *Robust error correction for real-valued signals via message-passing decoding and spatial coupling*, IEEE Information Theory Workshop (ITW 2013), 1-5 (2013) .
- F. Krzakala, M. Mézard, L. Zdeborová, *Phase Diagram and Approximate Message Passing for Blind Calibration and Dictionary Learning*, IEEE International Symposium on Information Theory Proceedings (ISIT), p. 659 - 663 (2013).
- P. Zhang, F. Krzakala, M. Mézard, L. Zdeborová, *Non-adaptive pooling strategies for detection of rare faulty items*, IEEE International Conference on Communications Workshops (ICC 2013), Pages: 1409 - 1414, (2013).
- F. Krzakala, M. Mézard, L. Zdeborová, *Compressed Sensing under Matrix Uncertainty: Optimum Thresholds and Robust Approximate Message Passing*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), p. 5519 - 5523 (2013).
- J. Barbier, F. Krzakala, M. Mézard, L. Zdeborová, *Compressed Sensing of Approximately-Sparse Signals: Phase Transitions and Optimal Reconstruction*, Proc. of 50th Allerton Conf. pp. 800-807, IEEE (2012).
- A. Coja-Oghlan, L. Zdeborová, *The condensation transition in random hypergraph 2-coloring*, Proceedings of SODA 2012, pp. 241-250; preprint arXiv:1107.2341 (2012).
- L. Zdeborová, S. Backhaus, M. Chertkov, *Message Passing for Integrating and Assessing Renewable Generation in a Redundant Power Grid*, proceedings of HICSS-43 (2010), arXiv:0909.2358v1.

Other refereed proceedings

- F. Krzakala, L. Zdeborová, *Performance of simulated annealing in p-spin glasses*, J. Phys.: Conf. Ser. 473 012022 (2013).
- J. Barbier, F. Krzakala, L. Zdeborová, P. Zhang, *The hard-core model on random graphs revisited*, J. Phys.: Conf. Ser. 473 012021 (2013).
- F. Krzakala, L. Zdeborová: *Phase Transitions and Computational Difficulty in Random Constraint Satisfaction Problems*, J. Phys.: Conf. Ser. 95 012012 (2008).

News and Views

- L Zdeborová, *Machine learning: New tool in the box*, Nature Physics 13, 420-421, 2017.

Reviews, thesis, books and book contributions

- L. Zdeborová, F. Krzakala, *Statistical physics of inference: Thresholds and algorithms*, **invited review**, Advances in Physics 65, 453-552 (2016). Based on my HDR thesis.
- *Statistical Physics, Optimization, Inference, and Message-Passing Algorithms*, Lecture Notes of the Les Houches School of Physics-Special Issue, October 2013, Editors.: F. Krzakala, F. Ricci-Tersenghi, L. Zdeborová, R. Zecchina, E. W. Tramel, L. F. Cugliandolo, Oxford University Press (2015).
- L. Zdeborová, *Statistical physics of Hard Optimization Problems*, PhD thesis, **invited for publication as a review article** in Acta Physica Slovaca 59, No.3, 169-303 (2009).
- E. Maneva, T. Meltzer, J. Raymond, A. Sportiello, L. Zdeborová: *A Hike in the Phases of the 1-in-3 Satisfiability*, Lecture notes of the Les Houches Summer School 2006, Session LXXXV, Complex Systems, Volume 85, 491-498, Elsevier 2007.
- L. Zdeborová, *Stability of the spin glass mean field theory researched by the method of real replicas*. Master diploma thesis.

Seminars and short visits

- Statistics Seminar, 12 May 2017, Cambridge University, UK.
- Chicago University, 24.-28. April, seminar “Computations in Science”, and in the Statistics Seminar.
- Duke University, 23.-30. Octobe. Seminar in the “Center for Nonlinear and Complex Systems” and “Adventures in Theory” seminar.
- LRI, Univ. Paris XI, TAO group seminar, 28. June 2016.
- Combinatorics Seminar **Philippe Flajolet**, IHP Paris, 2. June, 2016.
- **Stanford** Probability seminar, 8. February, 2016.
- **Visitor of the Santa Fe Institute**, 4.-31. July 2015.
- Colloquium of the physics department of ENS, 28. 3. 2015.
- **MIT**, 15 August, 2014, Stochastics and Statistics Seminar.
- **Harvard**, 13 August, 2014, Widely Applied Math (WAM) Seminar.
- Warwick, 6 November, 2013, Complexity Forum.
- SAMM, Univ. Paris 1, 20 June 2013, seminar of Statistics and multidisciplinary modelisation.
- LIPN Univ. Paris 13, 18 June 2013, “CALIN” combinatorics seminar.
- LIAFA Univ. Paris 7, 7 February 2013, Enumerative and analytic combinatorics seminar.

- ENS Paris, 31 January 2013, theoretical neuroscience lunch seminar.
- Visiting the ELC Center, Tokyo, Japan, 13.-18.1. 2013, seminar.
- LPS ENS, Paris, France, 14 November 2012, LPS seminar.
- CNLS, Los Alamos, U.S.A., 15 August, 2012, Information Science and Technology Seminar.
- AgroParisTech, France, 20 March, 2012, seminar.
- King's College London, UK, 28 March, 2012, seminar.
- INRIA ENS, Paris, France, 8 March, 2012.
- La Sapienza Univ., Rome, Italy, 22–25 March, 2011, seminar.
- LIED, Université Paris 7, France, February 22, 2011; Atelier of Exchange about Smart Grid.
- Tokyo Institute of Technology, Tokyo, Japan, November 7–28, 2010, scientific visit in the group of H. Nishimori. **Invited doctoral lecture (9h).**
- CNLS, Los Alamos, U.S.A., January 21, 2010; CNLS postdoc seminar.
- LPT Orsay, Université Paris 11, France, October 2, 2009; Statistical Physics Seminar.
- LPTMC, Université Paris 6, France, October 22, 2009.
- LPTHE, Université Paris 6, France, October 19, 2009.
- Chicago University, U.S.A., September 30, 2009; Computations in Science seminar.
- Santa Fe, U.S.A., September 24, 2009; Santa Fe Institute colloquium.
- CNLS, LANL, Los Alamos, U.S.A., July 9, 2009.
- PCT, ESPCI, Paris, France, May 14, 2009.
- CPT, Marseille, France, May 12, 2009.
- Doppler Institute, Prague, Czech Republic, May 5, 2009; Doppler Institute seminar.
- KAM, MFF UK, Prague, Czech Republic, May 4, 2009; 3h tutorial.
- IPhT, Saclay, France, April 30, 2009; IPhT-STA seminar.
- LPS ENS, Paris, France, April 28, 2009; CONDMAT-ENS seminar.
- Stanford University, CA, U.S.A., November 3–15, 2008; scientific visit, host Andrea Montanari.
- CNLS, LANL, Los Alamos, U.S.A., October 7, 2008; Physics of Algorithms Seminar.
- University of Warwick, UK, January 31, 2008; statistical physics seminar.
- CNLS, Los Alamos National Laboratory, U.S.A., January 13–19 and May 26–30, 2008; visits.
- SICS, Stockholm, Sweden, October 22–26, 2007; visit in the group of Erik Aurell, seminar.
- LPT/LPTMS Orsay, France, October 11, 2007; seminar of complex systems.
- SPhT, CEA-Saclay, France, March 12, 2007; seminar of statistical physics.
- ISI Foundation, Torino, Italy, January 11, 2007; joint seminar with Florent Krzakala.
- FZU AV CR, Department of Condensed Matter Theory, Prague, November 28, 2006.
- LPT/LPTMS Orsay, France, October 19, 2006; seminar of complex systems, with A. Sportiello.
- University of Koeln, Germany, May 25–28, 2006; scientific visit, seminar.
- Charles University, Prague, Czech Republic, April 4, 2006; Institute of Physics seminar.
- University Paris-Sud in Orsay, France, May 18 – June 3, 2005; scientific visit, host Marc Mézard.
- La Sapienza, Roma, Italy, April 23 – May 15, 2004; scientific visit in the group of G. Parisi.
- FZU AV CR, Department of Condensed Matter Theory, Prague, April 15, 2004.

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Presentations at Conferences, Schools, Workshops

- ISIT 2017, IEEE Int. Symp. on Information Theory, June 26.-30, 2015, Aachen, Germany.

- 1st CRM-IMPA joint workshop of "Challenges at the interface of optimization and stochastic processes" July 18.-21., 2017 in CRM Montreal; **invited talk**.
- AIM San Jose, USA, 22.-26. May 2017, "Connecting communities via the block model". Overview lecture.
- Groupe de Travail: Sequential Structured Statistical Learning, May 17th, 2017, IHES, Bures-sur-Yvette.
- Latelier Progresses in algorithms and numerical tools for QCD in Orsay Paris, **invited talk**.
- 42nd Conference of the Middle European Cooperation in Statistical Physics (MECO42), Lyon, 8-10 February 2017; **invited talk**.
- NIPS 2016, Barcelona, 8-10 December 2016.
- 7. November 2016, CEA Saclay, Journée de la matière et des systèmes complexe, **invited talk**.
- 54th Annual Allerton Conference on Communication, Control, and Computing, 27.-30. September, 2016, **invited talk**.
- Goethe University Frankfurt Phase transitions in discrete structures, 25.-29 July 2016. **Invited talk**.
- Summer Solstice 2016, 8th International Conference on Discrete Models of Complex Systems, University of Aveiro, Portugal, 20-22. June 2016. **Invited talk**.
- Workshop on "Networks: learning, information and complexity IHP, Paris, 18.-20. May, 2016. **Invited talk**.
- Workshop on "Random Instances and Phase Transitions", Simon's Institute UC Berkeley, 2.-6. May, 2016. **Invited talk**.
- Counting Complexity and Phase Transitions Boot Camp 25. 28. January, 2016, Simon's Institute UC Berkeley, **invited tutorial**.
- Information Theory and Applications Workshop, San Diego, 1.-3. February 2016, **invited talk**.
- The meaning of it all, conference in honor of G. Tarjus, 16.-18. December, Paris, **invited talk**.
- 53th Annual Allerton Conference on Communication, Control, and Computing, 29. September - 2. October, 2015, **invited talk**.
- Conference on Big Data, August 24-26, 2015, Harvard University, **invited talk**.
- KAM, MFF UK, Prague, 26.-27. June 2015, STTT'15 workshop - Current trends in theoretical computer science, **invited talk**.
- ISIT 2015, IEEE Int. Symp. on Information Theory, June 14.-19, 2015, Hong-Kong.
- Workshop Graphical Models, Statistical Inference, and Algorithms (GRAMSIA) May 18-22, 2015, IMA University of Minnesota, **invited talk**
- Workshop on Community Detection, IHP Paris, 26.-27. 2. 2015, **invited talk**
- Workshop Spin glasses, random graphs and percolation, IHP Paris, 16.-20.2.2015, **inv. talk**
- Workshop on Regulation and Inference in Biolog. Nets., Bardonecchia 2.-6. 2. 2015, **inv. talk**
- IHP Paris, 17.-18. November 2014, Workshop on Applications of Random Matrix Theory in Communications and Networks and Statistical Physics, **invited talk**
- IUPAP Conference on Comp. Physics CCP2014, 10-14 August, 2014, Boston, **invited talk**
- Journée GDR ISIS : Apprentissage de représentations et traitement du signal, 4 February, 2014, Telecom Paris, **invited talk**.
- Journées de la Physique Statistique 2014, 30-31 January, ESPCI, Paris, **invited talk**
- Theor. Foundations of Network Analysis Workshop, 7-8 November, UCL London, **invited talk**.
- Inference, Computation, and Spin Glasses, 28-30 July 2013, Sapporo, Japan, **invited talk**.
- STATPHYS25, July 22-26, 2013, Seoul, Korea, **invited talk**.
- ISIT 2013, IEEE International Symposium on Information Theory, July 7-12, 2013, Istanbul,

- Turkey, presentation of a paper.
- ICC'13 - IEEE ICC'13 Workshop NETSTAT, Budapest, 13 June 2013, presentation of a paper.
 - KAM, MFF UK, Prague, 7-8 June 2013, STTI'13 workshop - Current trends in theoretical computer science, **invited talk**.
 - Santa Fe Institute, U.S.A., 6-9 May 2013, Structure, Statistical Inference and Dynamics in Networks workshop, **invited talk**.
 - FEE CTU, Prague, 7.-8. 11. 2012, Czech workshop on applied math. in engineering, **inv. talk**.
 - Inria Paris-Rocquencourt, Paris, France, 12 June, 2012, Interdisciplinary Workshop on Inference, **invited talk**.
 - IPAM, UCLA, U.S.A, January 23 - 27, 2012; Mathematical Challenges in Graphical Models and Message-Passing Algorithms **invited talk**.
 - Institut Henri Poincare in Paris December 7–10, 2011; French-Japanese meeting on Jamming, Glasses and Phase transitions, **invited talk**.
 - Bardonecchia, Italy, February 14–18, 2011; Statistical physics of complexity, optimization, and systems biology, **invited talk**.
 - Tokyo, Japan, November 17–18, 2010; Stat. mech. and inf. science workshop, **invited talk**.
 - IHP, Paris, France, October 25–26, 2010; Reunion of GDR PHENIX on Nonlinearity, fluctuations and heterogeneity, **invited talk**.
 - Batz sur mer, October 13–15, 2010 Batz; Colloque de l'IPhT, talk.
 - Hong Kong, China, 13–16 July 2010, satellite meeting for STATPHYS 24: StatPhysHK Complexity, Computation, Information; talk.
 - Beijing, China, July 8–11, 2010; satellite meeting for STATPHYS 24: Statistical Physics and Computer Science; **invited talk**.
 - Trieste, Italy, June 14–18, 2010; ICTP workshop Quantum Statistical Mechanics, Computation and Information; **invited talk**.
 - March Meeting 2010, Portland, March 15–19, 2010; **invited talk**.
 - Les Houches, France, March 8–12, 2010; Statistical Physics of Complexity, Optimization and Biological information; **invited lecture**.
 - Kaua'i, Hawaii, U.S.A., January 5–8; 43rd Hawaii International Conference on System Science; presentation of a paper.
 - Banff, Canada, November 15–20, 2009; BIRS program Statistical Mechanics on Random Structures; **invited talk**.
 - Los Alamos, U.S.A., November 9–10. 2009; Stat. Learning for Stat. Physics; **invited talk**.
 - Barcelona, Spain, October 14–16, 2009; CRM workshop on Techniques and Challenges from Statistical Physics; **invited talk**.
 - Paris, France, October 8–9, 2009; PEPS meeting; talk.
 - Santa Fe, U.S.A., August 31 – September 4, 2009; Physics of Algorithms; **invited talk**.
 - Kyoto, Japan, November 25–28, 2008; Unifying Concepts in Glass Physics IV; talk.
 - Rutgers University, U.S.A., October 13–17, 2008; Dimacs Workshop on Message passing; **invited talk**.
 - Aspen, U.S.A., June 2–13, 2008; Aspen Center for Physics summer program Complexity, Disorder, and Algorithms; talk.
 - Stockholm, Sweden, May 15–18, 2008; NORDITA workshop Physics of distributed information systems; **invited talk**.
 - Eindhoven, Netherlands, March 10–14, 2008; EURANDOM workshop Stat. Mech. on Random Structures; **invited talk**.

- Kyoto, Japan, September 16–19, 2007; International Workshop on Statistical-Mechanical Informatics 2007; proceeding contribution.
- Mariehamn, Finland, July 15–18, 2007; Stat. mech. of distributed information systems; talk.
- Genova, Italy, July 9–13, 2007; StatPhys 23; poster presentation.
- Trieste, Italy, July 2–6, 2007; Common Concepts in Stat. Physics and Computer Science; talk.
- Zurich, Switzerland, March 5–6, 2007; Evergrow network (EU consortium FP6) review meeting; presentation The work-group SP4a.
- Jerusalem, Israel, February 19–21, 2007; Loopy Belief Propagation Algorithm and Applications workshop; **invited lecture**.
- Paris, France, January 25–26, 2007; Journées de physique statistique 2007; short talk.
- Rome, Italy, December 13–14, 2006; Evergrow network meeting; talk.
- Les Houches, France, July 3–28, 2006; Les Houches Summer school on Complex Systems; talk about work done during the school.
- Les Houches, France, February 20–24, 2006; workshop on Statistical Physics of Glasses; talk.
- Paris, France, January 26–27, 2006; Journées de physique statistique; short talk.
- Leuven, Belgium, September 4–17, 2005; summer school Fund. Problems in Stat. Physics XI.
- Les Houches, France, July 4–29, 2005; Les Houches school on Math. Stat. Physics; talk.
- Prague, Czech Republic, June 7–9, 2005; The Week of Doctoral Studies 2005; talk.
- Trieste, Italy, September 6–10, 2004; School and Conference on Fundamental Aspects of Complexity; poster presentation.
- Prague, Czech Republic, July 19–23, 2004; The 20th General Conference of the Condensed Matter Division European Physical Society; poster presentation.
- Hayama, Japan, July 12–15, 2004; Statistical Physics of Disorder Systems and its Applications; poster presentation, proceeding contribution.
- Villiasimus, Sardinia, Italy, September 15–20, 2003; SPHINX Conference; poster presentation.

Obtained Funding

- Collaborator on a 2 year postdoc project *ALgorithmes avancés pour Tomographie Inverse Multi-Energie* (ALTIME) with A. Brambilla from CEA Grenoble.
- Collaborator on a 1 year grant for a postdoc fellow from Labex Digicosme on *Approximate Message Passing for High-dimensional data analysis (AMPHI)* with B. Thirion and J. Salmon.
- **ERC Starting Grant** 2017-2022, Statistical Mechanics of Learning (SMiLe).
- PI of ANR Jeunes Chercheuses et Jeunes Chercheurs (JCJC), Statistical Physics of Inference in Neural Networks (SPINN), 2016–2020
- Collaborator on a DRF of CEA Impulsions grant, 1 year of postdoctoral fellowship, Approximate Message Passing for the efficient identification of cognitive networks (BrainAMP), in collaboration with B. Thirion’s group from Neurospin, 2016–2017.
- Labex PALM, PI of a grant for a 2-year postdoctoral fellowship, Statistical Mechanics of Un-supervised Representation Learning (SAMURAI), in collaboration with S. Franz from LPTMS, Univ. Paris-Sud, 2016–2018.
- PhD scholarship for Cristian Schmidt from the Initiative Doctorale Interdisciplinaire of the IDEX Univ. Paris-Saclay, 2015–2018.
- IDEX Paris-Saclay grant for preparation of a resubmission of an ERC Starting Grant 2015/16.

- CNRS Écoles thématiques Spin Glass 2014 in Cargese, Corsica.
- PEPS 2013, CNRS, PI of an interdisciplinary project ASPIT (Applying Statistical Physics to Information Theory, Signal Processing and Machine Learning), 2013.
- RTRA (Triangle de la Physique) & labex PALM PI of two years postdoc funding for F. Caltagirone on Theory and Applications of Spatial Coupling (TASC), 2012–2014.
- RTRA (Triangle de la Physique) starting/installation grant DySpaN (Dynamics on sparse networks) for 2011-2015.
- ISC-PIF (Institut des systèmes complexes, Paris Ile de France) funding for a 1 year postdoctoral position, joint with F. Krzakala, 2012-2013.
- CEA/DSM Recherche Fondamentale pour l’Energie, funding for a 1 year postdoctoral position, joint with Marc Barthelemy, 2011-2012.
- I participated in the Los Alamos National Laboratory LDRD/DR grant *Optimization and Control Theory for Smart Grids* for 2010–2012, principal investigators M. Chertkov and R. Bent. I contributed to the proposal preparation.
- I obtained the Director’s postdoctoral fellowship of the Los Alamos National Laboratory for 2008–2010 for a project *Statistical physics of optimization*.
- I obtained subvention from the French ministry for higher education and research “cotutelles internationales de thèse” for 2007–2008.
- I obtained Scholarship of the French government (Bourses du Gouvernement français) for Ph.D. “en cotutelle” for for 2005–2008 a project on *Application of statistical physics in combinatorial optimization*.

Organization of scientific events

- Les Houches Summer School on *Physics and Machine Learning*, August 2020, together with F. Krzakala, G. Ben-Arous, S. Ganguli.
- Workshop *Spin Glasses and Related Topics* in BIRS Banff, Canada, 30.9.–5.10. 2018, together with D. Panchenko, A. Auffinger, W.-K. Chen.
- *Statistical Physics and Machine Learning Back Together* in Cargese, Corsica; August 21.-30. 2018.
- Czech workshop on Complex Systems III, 21.-22. September 2017, CE-ITI & KAM MFF UK, Prague (with M. Loebl, J. Nešetřil).
- The Statistical Physics Cornucopia conference to celebrate Marc Mezard’s 60th birthday, 6.-8. September 2017, Paris.
- Boulder Summer School on Frustrated and Disordered Systems, 3.-28. July 2017, Boulder, Colorado (with P. Charbonneau, E. Corwin, F. Zamponi).
- Les Houches workshop “Statistical physics, learning, inference and networks”, February 26 - Mars 3, 2017 (with F. Krzakala).
- Satellite of STATPHYS26 “Inference problems in biology and computer science”, 10.-16.7. 2016 in Paris (with R. Monasson, S. Cocco, F. Krzakala, G. Semerjian, M. Weigt, F. Zamponi)
- Czech workshop on Complex Systems II, 24.-25. June 2015, CE-ITI MFF UK, Prague (with M. Loebl, J. Nešetřil).

- Since 2012 organizing roughly bi-weekly Golosino seminar on Inference, Compressed Sensing, Machine learning and Statistical Physics, ESPCI, Paris, (with Florent Krzakala).
- 2011-2015 organizing the monthly statistical physics seminar of the South of Paris Statistical Physics Federation (with Gregory Schehr, LPT Orsay).
- Conference & school “Spin glass and beyond: an old tool for new problems”, Cargese, Corsica, 25 August - 6 September 2014 (with F. Krzakala, F. Ricci-Tersenghi, G. Parisi).
- Workshop GDR ISIS & PHENIX “Analysis and Inference for Networks”, November 25, 2013, in Paris Télécom-Paristech (with P. Borgnat).
- Czech workshop on Complex Systems, 3-4 June 2013, CE-ITI MFF UK, Prague (with M. Loeb).)
- Autumn school in Les Houches, Statistical physics, Optimization, Inference and Message-Passing algorithms, September 30 – October 11, 2013 (with F. Krzakala, F. Ricci-Tersenghi, R. Zecchina).
- Summer program Disorder, Algorithms and Complexity in the Aspen Center for Physics, August 19 - September 9, 2012, Aspen, U.S.A. (with S. N. Coppersmith, J. Machta, A. Middleton, C. Moore)
- Workshop Bridging statistical physics and optimization, inference and Learning, February 19-24, 2012, Les Houches Physics School, France (with F. Krzakala, G. Parisi, S. Franz, F. Ricci-Tersenghi).
- Conference Unifying Concepts of Glassy Physics V, 12-16 December, 2011, IHP, Paris (with L. Cugliandolo, G. Biroli, O. Dauchot S. Franz T. Odagaki, S. Sastry, G Tarjus).
- Workshop “Physics of Algorithms” in Santa Fe, September 2009 (together with M. Chertkov, A. Percus, J. Johnson).

Reviewing, editing and evaluating

- 2014-16 editor of Scientific Reports (Nature group).
- Since 2017 editorial board of J. Phys. A.
- Reviewer for:
 - **Journals:** Nature; Nature Physics; Nature Communications; Physical Review Letters; Physical Review B; Physical Review E; Physical Review X; Scientific Reports; SIDMA (SIAM Journal for Discrete Mathematics); Random Structures and Algorithms. Europhysics Letters; European Physical Journal B; Journal of Mathematical Biology; Journal of Physics A: Mathematical and Theoretical; Journal of Statistical Physics; Journal of Statistical Mechanics: Theory and Experiment; Journal of Mathematical Physics; New Journal of Physics; Frontiers in Computational Neuroscience; International Journal of Computer Mathematics; Proceedings of the Royal Society A; Philosophical Magazine; Physica A; Theoretical Computer Science; IEEE Transactions on Control of Network Systems; IEEE Transactions on Network Science and Engineering; IEEE Transaction on Information Theory; IEEE Transaction on Signal Processing.
 - **Conferences:** IEEE International Conference on Smart Grid Communications; SAT 2011; STOC 2012, ISIT 2014, RANDOM 2014, SODA 2015, ICML 2016, NIPS 2016, ISIT 2017, NIPS 2017.
 - **Funding agencies:** NSF U.S.A.; l’Institut Mines-Télécom & Telecom Foundation; Czech Science Foundation, ANR France.

- **PhD thesis committees:** A. Klic (MFF UK Prague, 2013), G. Tavoni (ENS Paris, 2015), A. Saade (ENS Paris, 2016).
- Acting as expert for the European Commission FP7 in 2012, and H2020 in 2016.
- Jury for the competition for doctoral contracts of EDPIF 2017.

Committees and associations

- Since 2016 member of the scientific "bureau" of topic 2 of Labex PALM.
- Since 2016 member of the "comitee de pilotage" of CNRS Poncelet Laboratory in Moscow.
- Since 2016 member of the scientific council of IPhT.
- 2013-2017 member the scientific committee of GDR PHENIX.
- 2011-2016 member of the committee for computer resources of IPhT.
- Since 2000 member of the Jednota Českých Matematiků a Fyziků (Union of Czech Mathematicians and Physicists).

Teaching and supervising experience

- Master students mentoring
 - Benjamin Aubin, Master internship March-July 2017.
 - Stefano Sarao, Master internship February-June 2017.
 - Christian Schmidt, Master internship January-May 2015.
 - Nils-Eric Guenther, Master internship January-March 2015.
 - Thibault Lesieur, Master internship January-March 2014.
 - Jared Lolli, internship of Master I, February-July 2011.
- PhD students mentoring and co-mentoring
 - Benjamin Aubin, PhD student since September 2017.
 - Stefano Sarao, PhD student since September 2017.
 - Christian Schmidt, PhD student since October 2015.
 - Thibault Lesieur, PhD student since September 2014.
 - Yingying Xu (PhD in TokyoTech, supervisor Y. Kabashima) visiting PhD student October-November 2013, and September-October 2014, September 2015.
 - Christophe Schulke (PhD en cotutelle with F. Krzakala and F. Ricci-Tersenghi in Rome), PhD student, 2013-2016.
 - Andrey Lokhov (joint with M. Mézard), PhD student in LPTMS Orsay 2011-2014. Now postdoc in Los Alamos National Laboratory, USA.
 - Michele Castellana, summer student in LANL, April 8 – June 15, 2010. Now CNRS researcher at Institut Curie.
 - Aurelien Decelle, summer student in LANL, June 15 – July 25, 2009 and May 24 - June 11, 2010. Now assistant professor in LRI, Univ. Paris XI, France.
 - Petr Šulc, long term research visit in LANL, September 2009 – August 2010. Now Rockefeller postdoctoral fellow, U.S.A..

- Postdoc mentoring and co-mentoring
 - Fabrizio Antenucci, postdoc at IPhT, November 2016 till present. Working on a PALM project Statistical Mechanics of Unsupervised Representation Learning (SAMURAI).
 - Francesco Caltagirone, postdoc at IPhT, November 2012 - January 2015. Working on the RTRA & PALM project TASC. Now research fellow at INRIA Paris.
 - Hiroki Ohta (joint with S. Franz and M. Mézard), postdoc at LPTMS Orsay with S. Franz, 2011-2013. Now postdoc at Niels Bohr Institute.
 - Richard Morris (joint with M. Barthelémy), postdoc at IPhT, September 2011 - August 2013. Now postdoc Bangalore.
 - Pan Zhang (joint with F. Krzakala), postdoc at ESPCI, February 2012 - May 2013. Now Associate Professor, Chinese Academy of Sciences, Beijing.
- University courses
 - Spring 2017 lecture Big Data in ESPCI, Paris (for master students, 14h)
 - Lecturer in the **Doc-course 2014** on Structural Graph Theory at MFF UK in Prague.
 - Summer term of 2013, 2015: Tutorials in statistical physics (for L3 students), in ESPCI, Paris. Responsible professor J-F Joanny (2013, 12h), A. Maggs (2015, 16h).
 - Winter term of 2012, 2013, 2014, 2015: Tutorials of mathematics (for L3 and for M1 students), in ESPCI, Paris. Responsible professor Elie Raphael & Guilhem Semerjian , 24h each year.
 - Winter 2012: Lectures on Constraint satisfaction problems for Master II at ENS Lyon. 6h
 - November 2011, April 2013: Lecture on Smart grid for L3 in “Atelier Energies” at ENS, Paris. Responsible professor Gerard Weisbuch. 2h
 - November 2010: **Invited graduate lecture** *Statistical physics on random graphs*, Tokyo Institute of Technology, Tokyo, Japan. 9h
 - summer term of 2007 and 2008: Tutorials in statistical physics (for L3 students), in ESPCI, Paris. Responsible professor Jean-Phillipe Bouchaud. 16h each year.
 - summer term of 2005: Exercises from statistical physics (for L3 students), at MFF UK Prague. Responsible professor Václav Janiš. 24h
- Lecturer in summer schools
 - Probabilistic and Statistical Methods for Networks Summer School, 27.8. – 1.9. 2017, TU Berlin.
 - School on Classical and Quantum Information, 26.12.– 6.1. 2017, ICTS Bangalore, India.
 - Fall school on Random Graphs, 21.–25. 2015, Cargese, France.
 - Les Houches, France, March 8–12, 2010; Statistical Physics of Complexity, Optimization and Biological information.

Outreach and popularization of science

- Outreach lectures and seminars
 - “What can physics bring to machine learning?” in Paris Machine Learning Meetup, 8. June, 2016.
 - Center for Research and Interdisciplinarity (Center for Research and Interdisciplinarity) Paris, Visionary and Retrospective Talks, 28.1.2015 “Statistical Physics of Complexity”.

- Journées de l' Interdisciplinarité du CNRS, 10.-11. 12. 2014, siège du CNRS Paris. Invited presentation.
- “How hard is to find a needle in a haystack?” in Paris, 12 February, 2014, in Paris Machine Learning Meetup.
- Lecture “What numbers grow in nature?” from series Lectures from modern physics at MFF UK, Prague, December 22, 2005.
- Institute of Physics, AS CR, Prague, February 8, 2005: Sunflowers and Fibonacci series
- ÚTF MFF UK, Prague, December 7, 2004: Phyllotaxis, what numbers grow in nature?
- Article *Cracking Big Data with Statistical Physics* in Clefs CEA #64 (2017). Selected for an online highlight at TheConversation.com
- Portrait for SFP, Reflets de la Physique, n.42 (2015).
- Invited speaker in the *Women in Physics* session at STATPHYS25, Seoul, Korea, July 2013.
- Physical correspondence seminar (FyKoS) for secondary school students organized by students of Charles University, Prague
 - One of the principal organizers of FyKoS, 1999–2005.
 - Co-organizer of 8 week-schools for participants of FyKoS, lectures in physics, experiments, and games
- Physical olympiad, Czech Republic
 - Member of the central committee of the physics olympiad in Czech Republic, 2000–2008.
 - Training winners of Czech physical olympiad, 2000–2001.
- Pedagogical and popularization publications (in Czech):
 - J. Prachař, L. Zdeborová, *Fyzikální korespondenční seminář 1997-2007* matfyzpress, MFF UK, Prague, 2008. (collection of problems from the FYKOS physics seminar for years 1997–2007)
 - L. Zdeborová: *Statistická fyzika a barvení grafů (Statistical physics and graphs coloring)*, Československý časopis pro fyziku 57 n.5 (2007).
 - L. Zdeborová: *Květ slunečnice a Fibonacciova čísla (The sunflower and Fibonacci numbers)*, Rozhledy matematicko-fyzikální 82(1) (2007) 1–22.
 - B. Vybíral, L. Zdeborová: *Pohyb tělesa s vlivem odporových sil (Motion of bodies with friction forces)*, MAFY Hradec Králové (2002).
 - B. Vybíral, L. Zdeborová: *Odporové síly (Friction forces)* MAFY Hradec Králové (2001).
 - Ročenky fyzikálního korespondenčního semináře FYKOS (Annual collections of problems from the physical correspondence seminar FYKOS), contributions in n. 13–17 (2000–2004), MFF UK, Praha.
 - L. Zdeborová: *Fyzika nejen ve škole aneb Co je to FyKoS? (Physics not only at school or What is FyKoS?)*, Školská Fyzika VI (2000), No. 3.