

# GUILLAUME LECUÉ

Bureau 4B093  
Laboratoire d'analyse et mathématiques appliquées  
Université Paris Est – Marne-la-vallée  
Cité Descartes – Champs-sur-Marne  
5 Boulevard Descartes  
77454 Marne-la-vallée Cedex 2  
France

Tel: +33 (0) 1 60 95 77 32  
Fax: +33 (0) 1 60 95 75 45  
guillaume.lecue@univ-mlv.fr

Nationality: French.  
Date of birth: August 18, 1979 in Dinan (France).

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## CURRENT SITUATION

I am currently a CNRS researcher at the Laboratoire d'analyse et mathématiques appliquées, LAMA, UMR 8050, Marne-la-vallée.

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## INVITATIONS

- Jan. 2010; Feb. 2010 Department of mathematics of Technion, Haïfa, Israël. Invited by Pr. Shahar Mendelson.
- August 2009-Sept. 2009 Mathematical Science Institute (*MSI*) at Australian National University (*ANU*), Canberra, Australia. Invited by Pr. Shahar Mendelson.
- May. 2009; August 2009; February 2009 Department of mathematics of Technion, Haïfa, Israël. Invited by Pr. Shahar Mendelson.
- Sept. 2008-Nov. 2008 Seminar für Statistik, Zürich, Swiss. Invited by Pr. Sara van de Geer.
- May. 2008-June. 2008 Department of mathematics of Technion, Haïfa, Israël. Invited by Pr. Shahar Mendelson.
- Feb. 2008-March 2008 Departamento de Estadística, Universidad de Valparaiso, Valparaiso, Chile. Invited by Dr. Karine Bertin.
- Oct. 2007-Dec. 2007 Department of mathematics of Technion, Haïfa, Israël. Invited by Pr. Shahar Mendelson.
- July 2007-Oct. 2007 Mathematical Science Institute (*MSI*) at Australian National University (*ANU*), Canberra, Australia. Invited by Pr. Shahar Mendelson.
- March 2006 Department of Statistics of University of California, Berkeley (*UCB*). Invited by Pr. Peter Bickel.
- April 2006 Department of Mathematics of the Institute of Technology of Georgia (*Georgia Tech*), Atlanta, USA. Invited by Pr. Vladimir Koltchinski.

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## AWARDS

1. "*Mark Fulk award*" for the best student paper in learning theory. (June 2006, Pittsburgh. 500\$).

2. "Prix de la chancellerie des universités de Paris" for the best PhD thesis in Mathematic and its applications defended in Paris. (December 2008, Paris. 10000€).

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## PUBLICATIONS AND PREPRINTS

1. S. Gaïffas et G. Lecué, **Weighted basis-pursuit and fixed point algorithms for compressed sensing and matrix completion.** *Submitted.*
2. G. Lecué et S. Mendelson, **A remark on non-exact oracle inequalities with applications to high-dimensional data analysis.** *Submitted .*
3. Djalil CHAFAÏ, Olivier GUÉDON, Guillaume LECUÉ et Alain PAJOR, **Interactions between Compressed sensing, Random matrices and High dimensional geometry.** To appear in the collection "Panoramas et synthèses" of Société de Mathématiques Française.
4. S. Gaïffas and G. Lecué, **Sharp oracle inequalities for high-dimensional matrix prediction.** To appear in *IEEE - transaction on information theory.*
5. G. Lecué and C. Mitchell, **Oracle inequalities for cross-validation type procedures.** *Submitted.*
6. G. Lecué and S. Mendelson, **On the optimality of the empirical risk minimization procedure for the Convex aggregation problem.** To appear in *Annals de l'Institut Henri Poincaré.*
7. G. Lecué and S. Mendelson, **On the optimality of the aggregate with exponential weights for low temperatures.** *To appear in Bernoulli Journal.*
8. S. Gaïffas and G. Lecué, **Hyper-sparse optimal aggregation.** *Journal of Machine Learning Research, 2011, Vol. 12(Jun): 1813 – 1833.*
9. G. Lecué and S. Mendelson, **Sharper lower bounds on the performance of the Empirical Risk Minimization Algorithm.** *Bernoulli*, 16(3), 2010, 605-613.
10. G. Lecué and S. Mendelson, **Aggregation Via Empirical Risk Minimization.** *Probability theory and related fields*, Vol. 145, Number 3-4, pp. 591-613. Novembre, 2009.
11. C. Chesneau and G. Lecué, **Adapting to Unknown Smoothness by Aggregation of Thresholded Wavelet Estimators.** *Statistica Sinica*, Vol. 19, Number 4, October 2009, pp. 1407-1418.
12. G. Lecué, **Classification with minimax fast rates for classes of Bayes rules with sparse representation.** *Electronic Journal of Statistics*, Vol. 2, pp. 741-773. 2008 .
13. K. Bertin and G. Lecué, **Selection of variables and dimension reduction in high-dimensional non-parametric regression.** *Electronic Journal of Statistics*, Vol. 2, pp. 1224-1241. 2008.
14. S. Gaïffas and G. Lecué, **Minimax rates and adaptivity in the Single-Index Model.** *Electronic Journal of Statistics*, Vol. 1, pp. 538-573. 2007

15. G. Lecué, **Suboptimality of Penalized Empirical Risk Minimization in Classification**. 20th Annual Conference On Learning Theory, COLT07. Proceedings. Bshouty, Gentile (Eds.). Springer. LNAI 4539, 142-156. Springer.
  16. G. Lecué, **Optimal rates of aggregation in classification**. *Bernoulli*, 2007, Vol. 13, No. 4, 1000-1022.
  17. G. Lecué, **Simultaneous adaptation to the margin and to complexity in classification**. *The Annals of Statistics*, 2007, Vol. 35, No. 4, 1698-1721.
  18. G. Lecué, **Optimal oracle inequality for aggregation of classifiers under low noise condition**. 19th Annual Conference on Learning Theory, COLT06. Proceedings. Gabor Lugosi, Hans Ulrich Simon (Eds.). Springer. LNAI 2006, 364–378. “Mark Fulk award” for “the best student paper”.
  19. G. Lecué, **Lower bounds and aggregation in density estimation**. *Journal of Machine Learning Research*, 2006, Vol. 7(Jun): 971–981.
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## RESEARCH ORGANISATION

**Fall School, 2009:** In November 16 to 20, 2009, Djalil Chafaï, Olivier Guédon, Shahar Mendelson, Alain Pajor and myself organized a Fall School on the campus of Paris-Est Marne-la-Vallée. The aim of this Fall School was to present some interactions between compressed sensing, random matrices and high dimensional geometry. Each of the five lecturers were asked to be given a five hours course. Our lecture notes will soon be published in the collection “Panoramas et synthèses” of the SMF (French Mathematical Association).

**International conference, 2010:** In May 2010, Djalil Chafaï, Olivier Guédon, Alain Pajor and myself organized an international conference: “Probability and geometry in high dimensions” at Paris-Est Marne-la-Vallée.

**Analysis workshop of LAMA:** I organize every week the workshop of the Math department of Paris-Est Marne-la-Vallée: “Probabilité, Analyse et Statistiques”.

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## INTERNATIONAL PRESENTATIONS

**Atlanta, January 2006:** Statistic seminary of Georgia Institute of Technology (Georgia Tech). *Invited by Vladimir Koltchinskii.*

**Berkeley, February 2006:** Statistic seminary of the department of computer science at the university of California Berkeley. *Invited by Peter Bartlett.*

**Berkeley, February 2006:** Statistic seminary of the department of statistics at the university of California Berkeley. *Invited by Bin Yu.*

**Pittsburgh, June 2006:** 19th Annual Conference on Learning Theory, COLT06.

**San Diego, June 2007** 20th Annual Conference on Learning Theory, COLT07.

**Lisboa, August 2007** 56th International Statistical Institute, 56th ISI. *Invited by Feng Liang.*

**Valparaiso, March 2008** Statistic seminary of the Departamento de Estadística de Universidad de Valparaiso. Chile. *Invited by Karine Bertin.*

**Zürich, October 2008** Statistics seminary of Seminar für Statistik of ETH. Zürich. Swiss. *Invited by Sara van de Geer.*

**Göttingen, November 2008** Workshop "Statistical regularization and qualitative constraints". Göttingen. Germany. *Invited by Sara van de Geer.*

**Canberra, August 2009** Statistical workshop at MSI. Australian National University. Australia. *Invited by Alan Welsh.*

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## TEACHING AND PROFESSIONAL EXPERIENCE.

Juillet-Août 2002 Training period at the INRIA of Rennes.

2002–2007 Teaching assistant for undergraduate and graduate students. *Université de Rennes 1 and Université Paris 6.*

2009 Fall school on "Interaction between compressed sensing, random matrices and high dimensional geometry" with Djalil Chafaï, Olivier Guédon, Shahar Mendelson and Alain Pajor.

2010 Main courses in Learning theory at école des ponts.

2010 Organization of TPE for students in L2-IMI.

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## FORMATION

May 2007 **CNRS researcher** Position.

July 2007- Dec 2007 **Post-doc** under the supervision of Pr. Shahar Mendelson at Department of mathematics of Technion, Haïfa, Israël and Mathematical Science Institute (*MSI*) at Australian National University (*ANU*), Canberra, Australia.

Sep. 2004-May 2007 **PhD student and teaching assistant at Université Paris 6.** The subject of my PhD is "Aggregation methods: optimality and fast rates." My adviser is Alexandre Tsybakov. *Laboratoire de Probabilités et Modèles aléatoires. Université Paris 6.*

2003–2004 **Master in stochastic modeling and statistics** (with honor (rank: 3-rd)).  
**Forth year at ENS Cachan.** *Université Paris-Sud, Centre Scientifique d'Orsay.*

2002–2003 **Agrégation in Mathematics, rank: 43-th** (highest-level french national competitive exam for high-school teacher recruitment, also used as a form of graduate in french academia).  
**Third year at ENS Cachan.** *Ker Lann, Université de Rennes 1.*

2001–2002 **Bachelor in mathematics** (with honor).  
**Bachelor in mathematical engineering** (with honor).

Paris, October 6, 2011