

Curriculum Vitæ - Andrea Montanari

Depts of Electrical Engineering
and Statistics, Stanford University

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Education

MSRI, Berkeley	Mathematics	Postdoctoral fellow, 2005
Ecole Normale Supérieure, Paris	Physics	Marie Curie fellow, 2001
Scuola Normale Superiore, Pisa	Physics	Ph.D., 2001
Università di Pisa	Physics	Laurea, 1997

Professional history

2015-present	Professor – Stanford University
2010-2015	Associate Professor – Stanford University
2006-2010	Assistant Professor – Stanford University
2002-2010	<i>Chargé de Recherche</i> (permanent position with CNRS) Laboratoire de Physique Théorique de l'Ecole Normale Supérieure

Distinctions

2018 ICM Sectional Speaker (Probability and Statistics)
2016 James L. Massey Research & Teaching Award of the Information Theory Society
2015 INFORMS/Applied Probability Society, Best Publication Award
2014 IEEE, Information Theory Society distinguished lecturer
2013 Okawa Foundation research grant
2010 Google research award
2008 Sigmetrics best paper award
2008 Cisco Research Center grant
2008 NSF CAREER award
2006 CNRS bronze medal for theoretical physics

Selected Lectures and Talks

07/2017 Plenary talk at Conference On Learning Theory (COLT)
04/2015 Plenary talk at *IEEE Information Theory Workshop*
07/2013 Lecture series at *Saint Flour Lectures on Probability*
03/2013 Introductory lectures at *Seminar on Stochastic Processes (SSP 2013)*
08/2012 Plenary talk at *IEEE Information Theory Workshop*
08/2010 Plenary talk at *ICM satellite conference on Probability and Stochastic processes*

- 06/2010 Tutorial at the *ACM Symposium on Theory of Computing (STOC)*
- 08/2008 Lecture series at *XIIth Brazilian School of Probability* (with Amir Dembo)
- 07/2007 Plenary talk at *StatPhys 23*
- 06/2007 Tutorial at *International Symposium on Information Theory*
- 07/2006 Lecture series at Les Houches Summer School on *Complex Systems*
- 07/2005 Lecture series at Les Houches Summer School on *Mathematical Statistical Physics*

Research interests

Machine learning and high-dimensional statistics. Graphical models. Coding theory. Random combinatorial structures and optimization.

Professional service

- 2017– Scientific Advisory Committee, *Mathematical Sciences Research Institute, Berkeley*
- 2017– Associate editor, *Journal of the American Statistical Association*
- 2014– Associate editor, *IEEE Transactions on Information Theory*
- 2014–2016 Associate editor, *IEEE Transactions on Network Science and Engineering*
- 2013– Associate editor, *Annales de l'Institut Henri Poincaré D*
- 2012–2015 Associate editor, *Electronic Journal of Statistics*
- 2012–2014 Associate editor, *Operations Research*
- 2012– Associate editor, *Information and Inference. A Journal of the IMA*
- 2010–2012 Scientific Planning Committee, *Istitut Henri Poincaré, Paris.*
- 2009 Guest editor for *SIAM Journal on Discrete Mathematics*

Workshops and conferences organization

- 2018 Organization of the program “The Rough High-Dimensional Landscape Problem” at the Kavli Institute for Theoretical Physics, UCSB
- 2018 Organization of the semester program “Foundations of Data Science” at Simons Institute for the Theory of Computing, Berkeley
- 2018 TPC co-chair for the IEEE International Symposium on Information Theory
- 05/2016 Organization of the Workshop “Random Instances and Phase Transitions” at Simons Institute for the Theory of Computing, Berkeley
- 05/2015 Organization of the Workshop “Graphical Models, Statistical Inference, and Algorithms (GRAMSIA)” at IMA, University of Minnesota.
- 05/2015 Organization of the Workshop “Inference in high dimensional regression” at AIM, San Jose

- 04/2012 Organization of the Workshop “Random Walks and Random Media” at MSRI, Berkeley.
- 01/2012 Organization of the Workshop “Mathematical Challenges in Graphical Models and Message-Passing Algorithms” at IPAM, UCLA.
- 01/2010 Organization of the Workshop “New topics at the interface between probability and communications” at Newton Institute, Cambridge, UK.
- 2009 TPC member for the IEEE International Symposium on Information Theory
- 2009 TPC member for the IEEE Information Theory Workshop, Cairo (Egypt).
- 03/2009 Organization of the Workshop “29th Seminar on Stochastic Processes” at Stanford.
- 2009 TPC member for the IEEE Information Theory Workshop, Taormina (Italy).
- 12/2008 Organization of the Workshop “Statistical Mechanics” at Institut Henri Poincare (Paris).
- 2008 TPC member for International Symposium on Information Theory
- 2007 TPC member for International Symposium on Information Theory
- 06/2007 Organization of the Workshop “Common Concepts in Statistical Physics and Computer Science” held at International Center for Theoretical Physics (Trieste, Italy), supported by IUPAP and UNESCO
- 06/2004 Organization of the Workshop “Statistical Physics and Computational Problems: Beyond the Analogy” held at Institut Henri Poincare (Paris) and supported by the European Science Foundation.
- 01/2007 Organization of the Workshop “Theory and applications of message passing: probability, physics, computer science and communications” held at Institute for Information Theory and Applications (UCSD, San Diego)

Doctoral Students Supervised

Murat Erdogdu (Ph.D. 2017, Stanford Statistics)

Thesis title: *Steins Lemma and Subsampling in Large-Scale Optimization*

Assistant Professor, University of Toronto

Yash Deshpande (Ph.D. 2016, Stanford Electrical Engineering)

Thesis title: *Computational Limits in Statistical Estimation: Hidden Clique and Related Problems*

Schramm Postdoctoral Fellow, MIT and Microsoft Research

Sonia Bhaskar (Ph.D. 2015, Stanford Electrical Engineering)

Thesis title: *Structured Estimation in Healthcare and Low-Rank Matrix Recovery*

Data Scientist, Netflix

Adel Javanmard (Ph.D. 2014, Stanford Electrical Engineering)

Thesis title: *Inference and Estimation in High-dimensional Data Analysis*

Assistant Professor, University of Southern California

Morteza Ibrahimi (Ph.D. 2013, Stanford Electrical Engineering)
Thesis title: *Three Problems in High-Dimensional Statistical Parameter Estimation*
Research Engineer, Urban Engines

Jose Bento (Ph.D. 2012, Stanford Electrical Engineering)
Thesis title: *Learning graphical models, fundamental limits and efficient algorithms*
Assistant Professor, Boston College

Yashodhan Kanoria (Ph.D. 2012, Stanford Electrical Engineering)
Thesis title: *Learning in Social and Economic Networks*
Assistant Professor, Columbia University

Raghunandan Keshavan (Ph.D. 2012, Stanford Electrical Engineering)
Thesis title: *Efficient Algorithms For Collaborative Filtering*
Software Engineer, Google

Sewoong Oh (Ph.D. 2011, Stanford Electrical Engineering)
Thesis title: *Matrix Completion: Fundamental Limits and Efficient Algorithms*
Assistant Professor, University of Illinois at Urbana-Champaign

Postdoctoral Students Supervised

Marco Mondelli (2017-)

Emile Richard (2013-2015)
Senior data scientist, AdRoll

Mohsen Bayati (2009-2011)
Assistant Professor, Stanford University

Satish Babu Korada (2009-2010)
Quantitative Analyst at D.E Shaw & Co.

Patents

PRIVACY PROTECTION AGAINST CURIOUS RECOMMENDERS
Inventors: S. Ioannidis, E. Weinsberg, S. Bhagat, N. Fawaz, A. Montanari, N. Taft. Filed:
August 2013

USER IDENTIFICATION THROUGH SUBSPACE CLUSTERING
Inventors: S. Ioannidis, N. Fawaz, A. Montanari, A. Zhang. Filed: June 2013

METHOD AND APPARATUS FOR IDENTIFYING USERS FROM RATING PATTERNS
Inventors: J. Bento, N. Fawaz, A. Montanari, S. Ioannidis. Filed: August 2012

Other invited lectures and seminars

- 12/2017 Workshop on *Network Models: Structure and Function*, Oberwolfach, Germany
11/2017 Workshop on *Optimization, Statistics and Uncertainty*, Simons Institute, Berkeley
10/2017 *Charles River Lectures*, Cambridge, MA
9/2017 Lecture series, *Statistical Seminar* Frejus, France
9/2017 *The Statistical Physics Cornucopia* (Marc Mézard 60th birthday), Paris
6/2017 *Math+Stats+X* Conference (Dave Donoho's 60th birthday), Stanford
6/2017 Lecture series at Summer School on *Structured Regularization*, IHP, Paris
5/2017 Workshop on *Phase Transitions in Constraint Satisfaction Problems*, AIM, San Jose
5/2017 Workshop on *Nonconvex Statistical Learning*, USC
5/2017 Workshop on *Connecting communities via the block model*, AIM, San Jose
4/2017 NYU, MMathematics of Data Science (MADS) Colloquium
4/2017 MIT LIDS-Theory of Computing Joint Colloquium
4/2017 Workshop on *Optimization and Statistical Learning*, Les Houches, France
3/2017 Simons Foundation, New York, *Collaboration on Cracking the Glass Problem*
2/2017 San Diego, *Information Theory and Applications*, Plenary lecture
- 11/2016 Yale University, *Statistics Colloquium*
11/2016 Princeton University, *Applied Mathematics Colloquium*
8/2016 Northwestern University, Chicago, *Midwest Probability Colloquium*
8/2016 Beg-Rohu, France, *Lecture series at Beg-Rohu Summer School of Statistical Physics*
7/2016 Paris, *Statistical physics methods in biology and computer science*
6/2016 Oxford University, *Statistics Department Distinguished Seminar*
5/2016 Institut Henri Poincare, Paris, *Networks: learning, information and complexity*
4/2016 UC Berkeley, *Berkeley-Stanford Joint Statistics Colloquium*
3/2016 Carnegie Mellon University, Pittsburgh, *Google Distinguished Lecture*
3/2016 Hausdorff Research Institute for Mathematics, Bonn, *Harmonic Analysis, Graphs and Learning*
3/2016 Workshop, *Computationally and Statistically Efficient Inference for Complex Large-scale Data*, Oberwolfach, Germany
2/2016 Workshop *Approximate Counting, Markov Chains and Phase Transitions Workshop*, Simons Institute, Berkeley
1/2016 *Counting Complexity and Phase Transitions Boot Camp*, Simons Institute, Berkeley
- 12/2015 NIPS 2015 Workshop on *Advances in Approximate Bayesian Inference*
12/2015 NIPS 2015 Workshop on *Adaptive Data Analysis (WADAPT)*
12/2015 NIPS 2015 Workshop on *Modelling and inference for dynamics on complex interaction networks*
12/2015 International Matheon Conference on Compressed Sensing and its Applications 2015, Berlin Technical University, *Plenary talk*
- 12/2015 Stanford University, Applied Math Seminar
11/2015 University of Southern California, Statistics Seminar
11/2015 Simons Collaboration on Algorithms and Geometry, Simons Foundation, New York
10/2015 University of Michigan at Ann Arbor, Statistics Colloquium
10/2015 Mathematical Sciences Research Institute, Berkeley, USA, Workshop on *New challenges in PDE: Deterministic dynamics and randomness in high and infinite dimensional systems*
- 9/2015 53rd Annual Allerton Conference on Communication, Control, and Computing, *Invited Tutorial*
8/2015 Conference on Big Data, Center for Mathematical Sciences and Applications, Harvard University
8/2015 Joint Statistical Meeting, Seattle
7/2015 SAHD: Workshop on Sensing and Analysis of High-Dimensional Data, Duke University
6/2015 47th Meeting of the French Statistical Society, *Plenary Talk*, Lille, France
5/2015 Seymour Sherman Lecture, University of Indiana
5/2015 21st-Century Statistics at MIT: *Inaugural Symposium*
4/2015 IEEE, Information Theory Workshop, *Plenary Talk*
4/2015 IMA, University of Minnesota, *Workshop on Information Theory and Concentration Phenomena*
4/2015 Berkeley, Probability Seminar
3/2015 Stanford, Probability Seminar
3/2015 Simons Institute for the Theory of Computing, Berkeley, *Information Theory Program seminar*

1/2015 Simons Institute for the Theory of Computing, Berkeley, *Coding: From Practice to Theory*

12/2014 CIRM, Marseille, France, *Meeting in Mathematical Statistics*

12/2014 Caltech, *Computing+Mathematical Sciences Seminar*

10/2014 Simons Institute for the Theory of Computing, Berkeley, *Spectral Algorithms: From Theory to Practice*

08/2014 Bremen, Germany, *8th International Symposium on Turbo Codes*

08/2014 Mambucaba, Brazil, *XVII Brazilian School of Probability*

05/2014 UCSD, *Seminar in communication theory and systems*

04/2014 Bertinoro, *Workshop on Sublinear Algorithms*

04/2014 Wharton, UPenn, *Statistics Colloquium*

04/2014 Courant Institute, *Probability and Mathematical Physics Seminar*

02/2014 UCSD, Workshop on *Information Theory and Applications*

12/2013 NIPS 2013 Workshop on *Perturbations, Optimization, and Statistics*

11/2013 Simons Institute for the Theory of Computing, Berkeley, *Unifying Theory and Experiment for Large-Scale Networks*

11/2013 Stanford, Statistics Seminar

10/2013 Les Houches, France, lecture series at autumn school on *Statistical physics, Optimization, Inference and Message-Passing algorithms*

09/2013 Columbia University, lecture series at *Conference on Graphical Models*

02/2013 BIRS, Banff, Canada, *Asymptotics of Large-Scale Interacting Networks*

02/2013 University of British Columbia, *IAM-PIMS Distinguished Colloquium*

02/2013 UIUC, *CSL Student Conference*, Keynote presentation

02/2013 UCSD, Workshop on *Information Theory and Applications*

01/2013 IPAM workshop on *Structure and Randomness in System Identification and Learning*

12/2012 NIPS Workshop on *Social Choice: Theory and Practice*

12/2012 NIPS 2012 Workshop on *Perturbations, Optimization, and Statistics*, Keynote presentation

10/2012 50th Allerton Conference on Communications Control and Computing

09/2012 3rd IFAC Workshop on *Distributed Estimation and Control in Networked Systems*, Plenary talk

09/2012 IEEE *Information Theory* Workshop, Plenary talk

05/2012 NSF Workshop for High-Dimensional Data, Yale

05/2012 SIAM Conference on Imaging Science, Philadelphia

03/2012 MIT, ORC Colloquium

02/2012 UCSD, Workshop on *Information Theory and Applications*

01/2012 UC Davis, *Statistics Colloquium*

01/2012 Indian Institute of Science, Bangalore, Four Lectures at the *School on Network Science in Electrical Engineering and Computer Science*

12/2011 Institut Henri Poincare, Paris, *Unifying Concepts in Glass Physics, V*

11/2011 Princeton University, *Applied and Computational Mathematics Colloquium*

11/2011 Princeton University, workshop *Counting, Inference and Optimization on Graphs*

11/2011 University of Chicago, *Applied Mathematics Colloquium*

11/2011 Caltech, *Statistics Colloquium*

06/2011 Stockholm, Sweden. *INFORMS Applied Probability Society Conference*

07/2011 Workshop on *Sensing and Analysis of High-Dimensional Data*, Duke University

05/2011 *Theory of Computation as a Lens on the Sciences*, UC Berkeley

03/2011 *Microsoft Research*, Redmond

03/2011 BIRS, Banff, Canada, Workshop on *Sparse and Low Rank Approximation*

02/2011 UCSD, Workshop on *Information Theory and Applications*

02/2011 Google Workshop on Market Algorithms.

02/2011 UCSC, *Condensed Matter Physics Colloquium*.

02/2011 Information Theory and Applications, San Diego.

11/2010 UC Davis. *Mathematical Physics Colloquium*

11/2010 UCLA. *Electrical Engineering Colloquium*

10/2010 UCLA. *Annual AMS meeting*

10/2010 Winedale, Texas. *Winedale workshop on high-dimensional statistical problems*
 09/2010 Workshop on *Seminal Interactions between Mathematics and Physics*
 09/2010 Brest, France. *6th International symposium on turbo codes and iterative information processing*
 06/2010 Gothenburg, Sweden. *Annual Meeting of the Institute of Mathematical Statistics*
 06/2010 Edinburgh. Keynote talk at workshop on *Stochastic Processes in Communication Networks*
 03/2010 Les Houches, France. Two lectures at the workshop *Statistical physics of complexity, optimization and systems biology*
 03/2010 Kyoto, Japan. Workshop *Statistical physics and informatics*
 03/2010 Bay Area ACM Chapter
 03/2010 Brown University, Providence, Applied Mathematics Seminar
 02/2010 UCSD, Workshop on *Information Theory and Applications*
 01/2010 Newton Institute, Cambridge, UK, Workshop on *New topics at the interface between probability and communications*
 01/2010 Cairo, Egypt, *IEEE Information Theory Workshop*

 12/2009 EURANDOM, Eindhoven, The Netherlands, Workshop on *Dynamic Random Environments*
 11/2009 Stanford University, Bay Area Theory Symposium (BATS 2009)
 11/2009 BIRS, Banff, Canada, Workshop on *Statistical Mechanics on Random Structures*
 11/2009 Duke University, Workshop on *Large Data Sets: Computation and Structure*
 10/2009 San Diego, USA, INFORMS Annual Meeting, session on *Matrix Rank Minimization*
 08/2009 EURANDOM, Eindhoven, The Netherlands, minicourse for the workshop *Order, Disorder and Double Disorder*
 07/2009 Cornell University, *15th INFORMS Applied Probability Society Conference*
 06/2009 Center for Mathematical Research, Montreal, Canada, Workshop on *Disordered Systems: Spin Glasses*
 05/2009 Center for Mathematical Research, Montreal Canada, Workshop on *Combinatorics, Randomization, Algorithms and Probability*
 03/2009 DIMACS, Working group on *Streaming, Coding, and Compressive Sensing: Unifying Theory and Common Applications to Sparse Signal/Data Analysis and Processing*
 03/2009 GeorgiaTech *Algorithms, Combinatorics, Optimization seminar*
 01/2009 Tata Institute, Mumbai, Workshop on *Graphical Models, Statistical Inference and Algorithms*

 10/2008 46th Allerton Conference on Communications Control and Computing
 10/2008 DIMACS, Working group on *Message Passing algorithms and hard combinatorial problems*
 10/2008 Princeton Center for Theoretical Science, Quantum Computing Seminar
 10/2008 Microsoft Research, Cambridge, MA, Joint MSR-LIDS Colloquium
 10/2008 HP Labs, Palo Alto, Information Theory Seminar
 09/2008 Institut Henri Poincare, Paris, Course for the *Summer School on Random Media, Phase Transitions and Information Theory*
 08/2008 Boulder, Colorado, Workshop on *Random Matrix Theory and Wireless Communications*
 07/2008 BIRS, Banff, Canada, Workshop on *Message passing algorithms and hard combinatorial problems*
 07/2008 Paris, Workshop on *Stochastic Networks*
 04/2008 Maresias, Brazil, Workshop on *Analysis of Algorithms*
 03/2008 Santa Fe, US, Workshop on *Classical and Quantum Information*
 01/2008 UCSD, US, Workshop on *Information Theory and Applications*
 01/2008 San Diego, US, *AMS meeting*

 11/2007 Stanford, CS Theory.
 11/2007 UCSC, Condensed Matter Seminar
 11/2007 Statistical Physics at Stanford.
 10/2007 Joint Berkeley-Stanford Colloquium.
 10/2007 BIRS, Banff, Canada, Workshop on *Entropy of Hidden Markov Processes and Dynamical Systems.*
 09/2007 Kyoto International Workshop on Statistical Physics Informatics.
 06/2007 Institut d'Haute Etudes Scientifiques, Paris.
 05/2007 IPAM Workshop on *Random and Dynamic Graphs and Networks.*
 05/2007 Los Alamos Workshop *Algorithms, Inference and Statistical Physics.*
 03/2007 GaTech-DIMACS Workshop on *Phase Transitions in Random Structures and Algorithms.*

- 03/2007 Caltech Workshop on *The Computational Worldview and the Sciences*.
01/2007 Information Theory and Applications, San Diego.
- 10/2006 43rd Annual Allerton Conference on Communication, Control, and Computing. Monticello, Illinois, USA.
- 10/2006 DIMACS Workshop on *Properties of Large Graphs: From Combinatorics to Statistical Physics and Back*.
- 10/2006 ICME Stanford Seminar.
10/2006 Stanford OR Seminar.
09/2006 Berkeley Probability Seminar.
04/2006 MIT Applied Probability Seminar
03/2006 Stanford, ISL colloquium.
02/2006 Information Theory Workshop, Punta del Este, Uruguay
02/2006 Centro di Ricerca Matematica Ennio de Giorgi, Pisa, *Mathematical aspects of high performance codes: state of the art and open problems*, 9 hours course.
02/2006 Les Houches Meeting (STIPCO), 3 hours course.
01/2006 Newton Institute, Cambridge, UK. Workshop on *Relaxation Dynamics of Macroscopic Systems*.
01/2006 Oxford Combinatorics Seminar
- 09/2005 42nd Annual Allerton Conference on Communication, Control, and Computing. Monticello, USA.
09/2005 Rome, Italy, Workshop on *Statistical Physics of Disordered Systems and Applications*.
02/2005 Mathematical Sciences Research Institute, Berkeley, USA, Workshop on *Markov Chains in Algorithms and Statistical Physics*. MSRI, Berkeley, USA
05/2005 *CS Theory Lunch Seminar*. Berkeley, USA
04/2005 *Information Systems Laboratory Seminar*. Standord, USA.
04/2005 *Networking seminar*. UC Berkeley, USA.
03/2005 Mathematical Sciences Research Institute, Berkeley, USA, *Workshop: Phase Transitions in Computation and Reconstruction*.
02/2005 *Theory group seminar*. Microsoft Research, Redmond, USA.
01/2005 *Workshop: Applications of Statistical Mechanics to Coding Theory*. Los Alamos National Laboratories, USA
- 10/2004 *IEEE Information Theory Workshop*. San Antonio, USA.
09/2004 International Centre for Theoretical Physics, Trieste, Italy, STIPCO/DYGLAGEMEM meeting: *Fundamental Aspects of Complexity*.
09/2004 Rome, Italy, Conference on *Statistical Mechanics, Chaos and Condensed Matter Theory* (4th Giovanni Paladin Memorial).
04/2004 Monte Verità, Switzerland, *Equilibrium and Dynamics of Spin Glasses*.
09/2004 42nd Annual Allerton Conference on Communication, Control, and Computing. Monticello, Illinois, USA.
- 09/2003 Center for Nonlinear Sciences, Los Alamos, USA. *CNLS Colloquium*.
07/2003 EPFL, Lausanne, Switzerland. Summer Research Institute (School of Computer and Communication Sciences).
06/2003 Centro di Ricerca Matematica Ennio De Giorgi. Pisa, Italy. Two lectures during the workshop on *Probability and Statistical Mechanics in Information Science*.
05/2003 Kavli Institute for Theoretical Physics. Santa Barbara, USA, *Conference: Glassy States of the Matter and Nonequilibrium Quantum Dynamics*.
03/2003 Centro di Ricerca Matematica Ennio De Giorgi. Pisa, Italy, Workshop *Interacting Particles and computational Biology*
03/2003 *STIPCO/DYGLAGEMEM meeting: Statistical Physics of Glasses, Spin Glasses, Information Processing and Combinatorial Optimization*. Les Houches, France.
09/2002 International Centre for Theoretical Physics, Trieste, Italy, Summer School: *Statistical Physics, Probability Theory and Computational Complexity*.
- 12/2001 *DIMACS workshop: Codes and Complexity*. Rutgers, New Jersey, USA

- 11/2001 *Three lectures* at Laboratory for Information and Decision Systems (MIT) as a part of S. K. Mitter course on coding theory. Boston, USA
- 10/2001 *39th Annual Allerton Conference on Communication, Control, and Computing*. Monticello, Illinois, USA.