

## Elitza Maneva

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CONTACT INFORMATION IBM Almaden Research Center  
Computer Science Principles and Methodologies  
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RESEARCH INTERESTS Random structures and algorithms, constraint satisfaction and optimization, message-passing algorithms and heuristics, error correction and data compression.

EDUCATION **University of California at Berkeley, Berkeley, CA**  
PhD in Computer Science, 2001 - 2006  
Designated Emphasis in Communication, Computation and Statistics  
Thesis: "Belief Propagation Algorithms for Constraint Satisfaction Problems"  
Advisor: Alistair Sinclair GPA: 4.0/4.0

**California Institute of Technology, Pasadena, CA**  
BS in Engineering and Applied Science, 1997 - 2001  
Thesis: "Interactive Communication on Noisy Channels",  
Advisor: Leonard J. Schulman GPA: 3.6/4.0

EXPERIENCE **Postdoctoral Researcher**  
• *IBM Almaden Research Center, San Jose, CA* Oct 2006 - present  
Conducting research on complexity and algorithms for constraint satisfaction problems, and on algorithms for data-base applications.

**Research Intern**  
• *IBM Almaden Research Center, San Jose, CA* May - Dec, 2005  
Conducted research on the connectivity properties of the satisfiability solution space, and on rank aggregation.  
• *Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland* Mar - Jul, 2004  
Designed and analyzed algorithms for computing the failure probability of the Belief Propagation decoder for LT codes.  
• *IBM T.J. Watson Research Center, Yorktown Heights, NY* Jun - Sep, 2000  
Conducted research on maximally entangled states in quantum information.  
• *IBM T.J. Watson Research Center, Yorktown Heights, NY* Jun - Sep, 1999  
Conducted research on entanglement purification protocols in quantum information.  
• *Bates Linear Accelerator Center, MIT, Boston, MA* Jun - Sep, 1998  
Participated in the SAMPLE experiment collaboration.

**Teaching Assistant**  
• *University of California at Berkeley, Berkeley, CA* Jan - May, 2006  
CS 174 - Randomized Algorithms and Probabilistic Analysis, Prof. Peter Bartlett  
• *University of California at Berkeley, Berkeley, CA* Sep - Dec, 2004  
CS 70 - Discrete Mathematics and Probability for Computer Science, Prof. Satish Rao  
• *California Institute of Technology, Pasadena, CA* Sep, 2000 - Jun, 2001  
CS 138 - Computer Algorithms, Prof. Leonard Schulman.  
• *California Institute of Technology, Pasadena, CA* Sep, 1999 - Jun, 2000  
CS 20 - Theory of Computation, Prof. James Arvo.

## Programmer

- *Kellogg Radiation Lab, Caltech, Pasadena, CA* Jan - May, 1998  
Used C to develop a feedback control system for a piezo-electric device.

PUBLICATIONS	<p>"A New Look at Survey Propagation and its Generalizations", in <i>Journal of ACM</i>, Volume 54(4), pp. 2–41, 2007. Extended abstract appeared in <i>Proceedings of SODA</i>, pp. 1089–1098, 2005. With E. Mossel and M. Wainwright.</p> <p>"The Connectivity of Boolean Satisfiability: Computational and Structural Dichotomies", <i>Proceedings of ICALP</i>, pp. 346–357, 2006. With P. Gopalan, P. Kolaitis, and C. Papadimitriou.</p> <p>"New Model for Rigorous Analysis of LT codes", <i>Proceedings of ISIT</i>, pp. 2677–2679, 2006. With A. Shokrollahi.</p> <p>"Lossy Source Encoding via Message-passing and Decimation over Generalized Code-words of LDGM Codes", in <i>Proceedings of ISIT</i>, pp. 1493–1497, 2005. With M. Wainwright.</p> <p>"Power-aware Base Station Positioning for Sensor Networks" in <i>Proceedings of IEEE Infocom</i>, 2004. With A. Bogdanov and S. Riesenfeld.</p> <p>"On a Network Creation Game", in <i>Proceedings of PODC</i>, pp. 347–351, 2003. With A. Fabrikant, A. Luthra, C. Papadimitriou and S. Shenker.</p> <p>"Improved Two-party and Multi-party Purification Protocols" in <i>Quantum Computation and Quantum Information Science, AMS Contemporary Mathematics Series</i>, 2000. With J. Smolin.</p> <p>"Parity Violation in Elastic Electron-Proton Scattering and the Proton's Strange Magnetic Form Factor" in <i>Phys. Rev. Lett.</i>, vol 84, pp.1106–1109, 2000. With SAMPLE Collaboration: D.T. Spayde et al.</p>
SUBMITTED MANUSCRIPTS	<p>"On the Satisfiability Threshold and Clustering of Solutions of Random 3-SAT Formulas". With A. Sinclair.</p> <p>"Shelling Processes and a New Characterization of Convex Geometries". With F. Ardila.</p> <p>"Modeling and Reusing Generic Schema-Matching Algorithms". With I. Stanoi and M. Hernandez.</p>
INVITED TALKS	<p>Statphys 23 Satellite Workshop on Stat. Mech. of Distrib. Information Systems, Jul 2006 Schloss Dagstuhl, Workshop on Complexity of Constraints, Oct 3, 2006 Schloss Dagstuhl, Workshop on Complexity of Constraints, Oct 6, 2006 Toronto University, Theory Seminar, Mar 2006 Stanford University, Information Systems Colloquium, Feb 2006 Georgia Institute of Technology, Theory Seminar, Dec 2005 MSRI, Workshop on Phase Transitions in Computation and Reconstruction, Mar 2005 Allerton Conference on Communication, Control and Computing, Sep 2004</p>
PROFESSIONAL ACTIVITIES	<p>Refereed submissions for SIAM Journal of Computing, RANDOM, SODA, IEEE Transactions on Information Theory, STACS, SAT, ITW, FOCS.</p>
HONORS AND AWARDS	<p>UC Berkeley Regents Fellowship, 2001/2002 Graduated with Honors from Caltech, 2001. CRA's Outstanding Undergraduate Award Honorable Mention, 2000</p>

Caltech Trustee's Scholarship, 1999/2000.

Caltech Summer Undergraduate Research Fellowship, 1998, 1999.

#### REFERENCES

Prof. Phokion Kolaitis, IBM Almaden Research Center, *kolaitis@us.ibm.com*.

Prof. Christos Papadimitriou, University of California at Berkeley, *christos@cs.berkeley.edu*.

Prof. Alistair Sinclair, University of California at Berkeley, *sinclair@cs.berkeley.edu*.

Prof. Martin Wainwright, University of California at Berkeley, *wainwrig@eecs.berkeley.edu*.