

IOANA DUMITRIU  
CURRICULUM VITAE

**Address**

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**Personal Data**

Date of birth: July 06, 1976  
Citizenship: Romanian

**Fields of research**

Numerical Analysis, Random Matrix Theory, Algorithmic and Probabilistic Game Theory.

**Education**

June 2003 Massachusetts Institute of Technology  
Ph. D. in Applied Mathematics  
Thesis title: "Eigenvalue Statistics for Beta-ensembles"  
Thesis advisor: Professor Alan Edelman  
May 1999 College of Arts and Science, New York University  
Bachelor of Arts in Mathematics, minor in Computer Science, *Summa Cum Laudae*

**Employment**

09/2017-present Professor of Mathematics  
University of Washington, Seattle  
09/2010-09/2017 Associate Professor of Mathematics,  
Adjunct Associate Professor of Applied Mathematics,  
University of Washington, Seattle  
10/2008 - 09/2010 Adjunct Assistant Professor, Department of Applied Mathematics,  
University of Washington, Seattle  
09/2006 - 09/2010 Assistant Professor, Department of Mathematics,  
University of Washington, Seattle  
09/2003 - 08/2006 Miller Research Fellow  
Miller Institute for Research in Basic Sciences and  
Department of Mathematics, U.C. Berkeley

**Awards and Honors**

2013 NSF Conference Award 1314406 (total awarded: \$23,900)  
2012 Fellow of the American Mathematical Society  
2009 CAREER Award DMS 0847661, 2009-15 (1 yr extension, total awarded: \$408,325)  
2008 The 2008-10 Faculty Fellowship, Department of Mathematics, UW  
2007 The 13th Leslie Fox Prize in Numerical Analysis  
2005 Householder Prize for Best Dissertation in Numerical Algebra between 2002-04,  
Honorable Mention

**Publications**

(1) "Exploiting Tradeoffs for Exact Recovery in Heterogeneous Stochastic Block Models",  
with Amin Jalali, Qiang Han, and Maryam Fazel, appeared in *Advances in Neural Information Processing Systems 29 (NIPS 2016)*. Complete version at arXiv:1512.04937.

**Publications, cont'd.**

- (2) "Recovery and Rigidity in a Regular Stochastic Block Model", with Gerandy Brito, Christopher Hoffman, Shirshendu Ganguly, and Linh Tran. Extended abstract appeared in *ACM-SIAM Symposium on Discrete Algorithms (SODA) 2016*, complete version at arxiv:1507.00930 (2016), submitted.
- (3) "On expansion of  $G(n, d)$  with respect to  $G(m, d)$ ", with Mary Radcliffe, submitted, arxiv:1506.02614 (2016)
- (4) "Spectra of Overlapping Wishart Matrices and the Gaussian Free Field", with Elliot Paquette, submitted, arxiv:1410.7268 (2016)
- (5) "The Marčenko-Pastur law for sparse random bipartite biregular graphs", with Toby Johnson, to appear in *Random Structures and Algorithms*, arxiv:1304.4907.
- (6) "Global Fluctuations for Linear Statistics of  $\beta$ -Jacobi Ensembles", with Elliot Paquette; *Random Matrices: Theory and Applications* **1**(4) 1250013 (2012).
- (7) "Functional limit theorems for random regular graphs", with Toby Johnson, Soumik Pal, Elliot Paquette; *Probability Theory and Related Fields*, 1-55, August 2012.
- (8) "Smallest eigenvalue distributions for two classes of  $\beta$ -Jacobi ensembles", *Journal of Mathematical Physics*, **53** (2012), 103301 (15 pages)
- (9) "Sparse regular random graphs: spectral density and eigenvectors", with Soumik Pal, *Annals of Probability*, **40**(5) (2012), pp. 2197-2235.
- (10) "Minimizing Communication for Eigenproblems and the Singular Value Decomposition", with Grey Ballard and James Demmel, Technical Report No. UCB/EECS-2011-14, arXiv:1011.3077.
- (11) "Tridiagonal realization of the anti-symmetric Gaussian  $\beta$ -ensemble", with Peter Forrester, *Journal of Mathematical Physics*, **51**(2010), 093302 (25 pages)
- (12) "Accurate and efficient expression evaluation and linear algebra", with James Demmel, Olga Holtz, and Plamen Koev, *Acta Numerica*, **17** (2008), pp.87-145
- (13) "Distributions of the Extreme Eigenvalues of Beta-Jacobi Random Matrices", with Plamen Koev, *SIAM Journal on Matrix Analysis and Applications (SIMAX)*, **30** (2008), pp. 1-6.
- (14) "Fast linear algebra is stable", with James Demmel and Olga Holtz, *Numerische Mathematik*, **108**(1), (2007), pp. 59-91.
- (15) "Fast matrix multiplication is stable", with James Demmel, Olga Holtz, and Robert Kleinberg, *Numerische Mathematik*, **106**(2), (2007), pp. 199-224.
- (16) "MOPs: A Maple Package for Computing Multivariate Orthogonal Polynomials", with Alan Edelman and Gene Shuman, *Journal of Symbolic Computation*, **42**(6), (2007), pp. 587-620.
- (17) "Global spectrum fluctuations for the  $\beta$ -Hermite and  $\beta$ -Laguerre ensembles via matrix models", with Alan Edelman, *Journal of Mathematical Physics*, **47**, 063302 (2006) (36 pages).
- (18) "Toward accurate polynomial evaluation in rounded arithmetic", with James Demmel and Olga Holtz, *Foundations of Computational Mathematics: Santander 2005* (L. Pardo et al, eds.), **Cambridge University Press** (2006), pp. 36-105.
- (19) "Toward accurate polynomial evaluation in rounded arithmetic (short version)", with James Demmel, Olga Holtz, and Robert Kleinberg, *Proceedings of the Dagstuhl Seminar "Algebraic and numerical algorithms and computer-assisted proofs"*, (B.Buchberger et al, eds.)
- (20) "The Two-Batch Liar Game over an Arbitrary Channel", with Joel Spencer, *SIAM Journal on Discrete Mathematics*, **19** (4)(2006), 1056-1064.
- (21) "The Liargame over an Arbitrary Channel", with Joel Spencer, *Combinatorica* **25** (2005), pp. 537-559.
- (22) "Eigenvalues of Hermite and Laguerre ensembles: large beta asymptotics", with Alan Edelman, *Annales de L'Institut Henri Poincaré (B)*, **41** (6) (2005), pp. 1083-1099.

**Publications, cont'd.**

- (23) "A Halfliar's Game", with Joel Spencer, *Theoretical Computer Science, Special Issue on Algorithmic Combinatorial Game Theory*, **313**(3) (2004), pp. 353-369.
- (24) "Branching Processes with Negative Offspring Distribution", with Joel Spencer and Catherine Yan, *Annals of Combinatorics*, **7** (1) (2003), R-43.
- (25) "Path Counting and Random Matrix Theory", with Etienne Rassart, *Electronic Journal of Combinatorics*, **10**(1) (2003), 35-47.
- (26) "On Playing Golf with Two Balls", with Prasad Tetali and Peter Winkler, *SIAM Journal on Discrete Mathematics*, **16**(4) (2003), pp. 604-615.
- (27) "Matrix Models for all Beta-Ensembles", with Alan Edelman, *Journal of Mathematical Physics*, **43** (11) (2002), pp. 5830-5847.
- (28) "On Generalized Tribonacci Sequences and Additive Partitions", *Discrete Mathematics*, **219** (2000), pp. 65-83.

**Recent Conference Presentations and Invited Talks**

- March 2017 Queens University (Canada)  
Colloquium: "Spectra of regular and quasi-regular random graphs"
- December 2016 IPAM, UCLA  
Workshop *Synergies Between Machine Learning and Physical Models*  
Talk: "Two Clustering Problems Involving The Stochastic Block Model"
- April 2016 Courant Institute, NYU  
Random Roads: A Celebration of Joel Spencer's 70th Birthday  
Talk: "Two clustering problems in random graphs"
- April 2016 Banff Research Centre  
Workshop *Beta Ensembles: Universality, Integrability, and Asymptotics*  
Talk: "Extreme eigenvalue distributions of some beta-Jacobi ensembles and a numerical application"
- June 2015 Oberwolfach Research Institute for Mathematics  
Workshop *Free Probability*  
Talk: "Spectra of regular random graphs and related structures"
- May 2015 MIT Probability Seminar  
Talk: "Two Clustering Problems Involving the Stochastic Block Model"
- April 2015 AWM Research Symposium 2015, U. Maryland  
Workshop *Many Facets of Probability*  
Talk: "A Regular Binary Stochastic Block Model"
- February 2015 Combinatorics Seminar, UW  
Talk: "A Regular Stochastic Block Model"
- January 2015 Colloquium at Western Washington University  
Talk: "Random matrices in numerical linear algebra: a brief excursion"
- January 2015 Joint Mathematical Meetings 2015  
AMS Special Session on Probability and Applications  
Talk: "Randomize to optimize: a brief excursion in the uses of randomness in numerical line algebra algorithms"
- October 2014 Northwest Probability Seminar 2014, MSR  
Talk: "A Regular Stochastic Block Model"
- July 2014 SPA 2014, Workshop on *Random Matrix Theory*  
Talk: "A CLT for the Wishart Minor Process"
- May 2014 Mini-course instructor for IAS *Women and Math 2014*  
Course title: "Fluctuations from the Semicircle Law"
- May 2014 ICERM Workshop *Eigenvectors in graph theory and related problems in numerical linear algebra*  
Talk: "Network Clustering, the Stochastic Block Model, and a Regular Graph"

**Graduate Students Supervised**

Yizhe Zhu	(current)
Gerandy Brito Montes DeOca	(current, co-advised with Chris Hoffman)
Shirshendu Ganguly	(PhD 2016, co-advised with Chris Hoffman)
Tobias Johnson	(PhD 2014, co-advised with Soumik Pal)
Elliot Paquette	(PhD 2013)

**Postdocs Mentored**

Linh Vinh Tran	(2011-2014)
Mary Radcliffe	(2012-2015)

**Conference/Workshop/Lecture Series Organizer**

August 2013	<i>Workshop on Numerical Linear Algebra and Optimization</i> in honor of Michael Overton's 60th Birthday, UBC, Vancouver Co-organizer (with Chen Greif and Emre Mengi)
June 2013	<i>Joint AMS/Romanian Mathematical Society Meeting</i> , Alba Iulia, Romania Organizing Committee member (US side)
March 2013	<i>AWM Research Symposium 2013</i> , Santa Clara, CA Organizer of a special session on Random Matrix and Related Fields
2008-present	<i>MathAcrossCampus</i> , a public lecture series at UW Co-organizer with Rekha Thomas and Chris Hoffman
October 2007	<i>Pacific Northwest Numerical Analysis Seminar</i> , Seattle Co-organizer (with R. LeVeque)
July 2007	<i>ICIAM 2007</i> , Zurich, Switzerland Co-organized minisymposium on Random Matrix theory (with A. Edelman)
June 2006	<i>SIAM Discrete Math 2006</i> , Victoria, Canada Co-organized minisymposium on Liar Games and Coding Theory (with J. Spencer)
June-July 2005	<i>FOCM 2005</i> , Santander, Spain Co-organized workshop on Random Matrices (with A. Edelman and R. Rao)

**Other Experiences**

Autumn 2008-present	Co-organizer (with Rekha Thomas and Christopher Hoffman) MathAcrossCampus: a series of public lectures at UW
Fall 2004	Co-organized (with N. Reshetikhin) a Student Seminar on Random Matrices and Asymptotical Combinatorics;
05/2001-11/2002	Supervised and worked with an undergraduate student on a Maple package for Multivariate Orthogonal Polynomials (MOPs)
Summers '99, '00	Bell Labs, Lucent Technologies Summer Research Intern in the Fundamental Mathematics Department
1997	Participated in the Research Experience for Undergraduates Program at University of Minnesota, Duluth

**Memberships**

Phi Beta Kappa, SIAM, AMS, AWM

**Departmental Service**

Served on the Graduate Admissions, Appointments, Executive, Speakers, Putnam, and MathAcrossCampus (MAC) committees.

**Other academic and academically-related functions**

Member of MAA Putnam Problems Committee ('17-'19)

Member of AWM/NSF Travel Grants Committee (2015)

AMS representative to the MAA Committee on the American Mathematics Competitions (2015-2017)

Member of the Math Advisory Committee for arXiv (2014-present)

Chair of AMS Committee on Graduate Student Travel Grants (2014), regular member (2012-2014)

Member of AMS Committee on AMS Fellows Selection (2012-2013).

Member of the Alice T. Schafer Prize committee, 2009-2011.

Executive Board member for PBK, chapter Alpha of Washington.

Reviewer for *NSA*, *Annals of Mathematics*, *Annals of Statistics*, *RSA*, *JMVA*, *FOCM*, *LAA*, *SIMAX*, *PTRF*, *Integers: EJCNT*, *American Journal of Mathematics*, *Advances in Applied Mathematics*, *Theoretical Computer Science*, *Discrete Applied Mathematics*, *J. Combinatorial Theory A*.