

# Dmitry Ioffe Curriculum Vitae 2017

## Affiliation

Faculty of Industrial Engineering and Management,  
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## Personal Information

Date and place of birth: April 5 1963, Moscow  
Nationality: Israel  
Marital status: Divorced + 2

## Research Interests

Limit theorems of Probability theory; applications to classical and quantum Statistical Mechanics. Random interfaces, fields and interacting particle systems. Polymers in random environment Random perturbations of dynamical systems, metastability and homogenization.

## Education

**D.Sc** 1991 Mathematics, Technion.  
**M.Sc** 1985 System Engineering, Moscow Mining Institute.

## Academic Appointments

2014–to date Alexander Goldberg chair in Management Sciences, Technion.  
1997–to date Faculty of IE&M, Technion, Professor (since 2007).  
1995-1997: WIAS Berlin, BAT Ib Researcher.  
1993-1995: Department of Mathematics, Northwestern University, Assistant Professor.  
1992-1993: CIMS NYU, Visiting Researcher.  
1991-1992: Department of Mathematics, UC Davis, Assistant Professor.

## Visiting Positions

Bonn University (Sabbatical)	Aug. 2012–Aug. 2013
Cambridge University (Sabbatical)	July 2003–Aug. 2004
Filds Institute, Toronto	Feb. 2011.
University of Geneve	Sept. 2007, 2010, 2015
Bonn University and HIM	Aug. 2009, 2011, 2014, 2015, 2016
GSSI, L'Aquila	Feb. 2016
CNRS-CPT Luminy	Aug.–Oct. 2001, April 2006, Sept.–Oct. 2009, Feb. 2017
IHP Paris and Paris VII	March-April 1997, April 2002, Sept. 2008, Feb. 2015
WIAS Berlin	July - Aug. 2005, July–Aug. 2007, Aug. 2008
University Paris Dauphine	May 2007
Max Planck Institute, Leipzig	Sept. 2005
University of Bologna	Sept. 2002
University Rome 2	Sept.–Oct. 2000
University Cergy-Pontoise	Feb. 2000
University of Tokyo	Sept. - Oct. 1999
University of Zurich	Nov. 1996, March–April 1999
UCLA	Aug. - Sept. 1996

## Awards

1991 Technion, E.Landau prize for a distinguished D.Sc thesis.  
1997-99 Annie & Charles Corrin Academic Lecturer.  
2000 Kurt Mahler prize in mathematics.  
2006 Prix de l'Institut Henri Poincare 2004/05.  
2011 Humboldt Research Award.

## Grants

95-97 NSF research grant *Limit Theorems in Statistical Mechanical Setting*.  
99-02 ISF research grant *Probabilistic Problems of Phase Separation*.  
00-02 Nato research grant *Statistical Mechanics of Interfaces* (Israeli node).  
02-06 EU RTN grant *Mathematical Analysis of Large Quantum Systems*. (Israeli node with Yosi Avron).  
07-09 GIF research grant *Metastability and Stochastic Dynamics*. (with Anton Bovier).  
09-10 BSF Research grant *Stochastic geometry of quantum spin systems*. (with Lincoln Chayes)  
09-13 ISF Research grant *Stretched polymers in random environment*.  
14-17 Leverhulme Research grant *Laplacians, Walks, Quantum Spin Systems*, PI of Israeli node.  
14-18 ISF Research grant *Low temperature interfaces: Interactions, fluctuations and scaling*.

## Technion Activities

15 – to date            Technion Stirring Committee, Member.  
01–03, 15– to date    Head of the Area Probability and Statistics, Faculty of IE&M.  
09 – 10                Technion's standing committee, Member.  
08 – 11                Graduate Coordinator, Faculty of IE&M.  
08 – 11, 15– to date   Technion's Senate, Member.  
99–01, 07 – 09        Organizer of the Technion Probability Seminar.  
06 – 08                Dean's assistant on infrastructures, Faculty of IE&M.  
04 – 12                Interdisciplinary Committee on Applied Mathematics, Member.

## Public Professional Activities

16 – to date            Annals of Applied Probability, Associate editor.  
15– to date            Minerva Fellowship Committee, Member.  
99–02, 12-15          Stochastic Processes and their Applications, Associate editor.  
05–to date            ALEA, Latin American Journal of Probability and Mathematical Statistics  
Associate editor.  
07–13                Bernoulli Society's Committee on Conferences in Stochastic Processes  
Member.  
09, 11                GIF Scientific advisory board.

## Invited talks at international conferences

80 Invited talks at International conferences and 8 invited Mini-courses at international schools including:

- May 2000, *Probabilistic problems of phase segregation*, Bernoulli congress, invited session speaker
- July 2003, *Ornstein-Zernike theory of fluctuations*, ICMP Lisbon, invited session speaker.
- August 2003, *Stability of interfaces and stochastic dynamics in the regime of partial wetting*, SPA XXIX, Angra dos Reis, invited speaker.
- June 2004, *Entropy driven phase transition for hard rod systems on the lattice*, Mathematische Behandlung von Phasenübergängen, Oberwolfach.

- August 2004, *Local functionals on phase separation lines*, Large Scale Dynamics of Interacting Particle Systems, Oberwolfach.
- September 2006, *Decay of connectivities in subcritical models of dependent percolation*, Spatial Random Processes and Statistical Mechanics, Obrewolfach.
- June 2007, *Stochastic approach to the quantum Curie-Weiss model*, Matematische Behandlung von Phasenübergängen, Oberwolfach.
- April 2009, *Semi-directed polymers in random environment*, Mathematical Models from Physics and Biology, **keynote speaker**, Bonn
- July 2009, *Stochastic dynamics for the random field Curie-Weiss model: Metastability and escape times*, SPA XXXIII, invited session speaker, Berlin.
- August 2009, *Metastability via coupling in potential wells*, Scaling limits in models of statistical mechanics, Oberwolfach.
- June 2011, *Stochastic representations of quantum spin states*, SPA XXXV Oaxaca, **plenary speaker**.
- July 2011, *Stretched polymers in random environment: the ballistic phase*, 7th Cornell Probability Summer School, invited lecturer.
- September 2014, *Random walks and low temperature interfaces in two and three dimensions*, Laplacians, Random Walks, Bose Gas, Quantum Spin Systems, Bristol, **keynote speaker**.

### Organization of international conferences

- 2004 *8th Brazilian Summer School of Probability*, Member of Scientific Committee
- 2005 *Workshop on Random Interfaces and Directed Polymers*, Max Plank Institute for Mathematical Sciences and Leipzig University, Organizer
- 2009 *Joint BUT-Technion Probability Workshop*, Technion, Co-organizer
- 2009 *Graphical Representations in Statistical Physics*, SPA XXXIII Berlin, Invited session organizer
- 2010 *Phase Transitions*, Oberwolfach, Co-organizer.
- 2011 *Workshop on Disordered Polymer Models*, Fields Institute, Co-organizer.
- 2012 *8th World Congress of the Bernoulli Society*, Member of Programme Committee.
- 2014 *Laplacians, Random walks, Bose Gas, Quantum Spin Systems*, Bristol, Co-organizer.
- 2015 *Stochastic Processes and Random Fields: Geometry and Fine properties*, Haifa, Organizing committee.
- 2015 *Scaling Limits in Models of Statistical Mechanics*, Oberwolfach, Co-organizer.
- 2016 *Polymers, Interfaces and Self-Interacting Random Walks*, IRS Paris, Moderator.
- 2018 *Scaling Limits in Models of Statistical Mechanics*, Oberwolfach, Co-organizer.

### Graduate Students

2001-2003	Lev Greenberg	M.Sc. Thesis: <i>Limit properties of random fields</i> .
2003-2006	Oren Luidor	M.Sc. with distinction. Thesis: <i>Pinning phenomena and models of directed polymers</i> .
2004-2006	Anna Levit	M.Sc. with distinction. Thesis: <i>Stochastic geometry of quantum Curie-Weiss model</i> .
2006-2010	Anna Levit	Ph.D. Thesis: <i>Stochastic geometric methods in statistical mechanics</i> .
2007	Nicholas Crawford	Ph.D. Visiting student from UCLA.
2009	Oren Luidor	Ph.D. Visiting student from NYU.
2010	Alessandra Cipriani	Ph.D. Visiting student from University of Zurich.
2010,2012	Loren Coquille	Ph.D. Visiting student from University of Geneva.
2014	Patrick Muller	Ph.D. Visiting student from Bonn University.

## Post-Doctoral Fellows

Year	Name	Current Position
99-00	Thierry Bodineau	Directeur de Recherche, CNRS, France.
00	Yvan Velenik	Professor, University of Geneva.
00-01	Pietro Caputo	Professor, University Rome III.
01-02	Houman Owhadi	Professor, Caltech.
07	Gennady Shaikhet	Assistant Professor, Carleton University.
09-11	Nicholas Crawford	Assistant Professor, Technion.
09-10	Sreekar Vadlamani (Joint with R. Adler)	Stat Math Unit, ISI, Bangalore.
10-11	Anna Levit	Industry, Canada
12	Oren Louidor	Assistant Professor, Technion.
13-14	Jesse Goodman (Joint with N. Crawford)	University of Auckland.
13-14	Adela Svejda (Joint with O. Louidor)	Industry, Switzerland.
15-17	Aser Cortines (Joint with O. Louidor)	
17	Santiago Saglietti	

**Publications** (Papers with graduate students and post-docs are marked \*)

### Refereed Publications in Scientific Journals

- 1) D. Ioffe (1991), *On some applicable versions of abstract large deviation theorems*, Annals of Probability, **19**, 1629-1639.
- 2) D. Ioffe (1993), *Recurrent perturbations of certain transient radially symmetric diffusions*, Annals of Probability, **21**, 1124-1150.
- 3) D. Ioffe (1993), *Two examples in the theory of large deviations*, Statistics and Probability Letters, **18**, 297-300.
- 4) D. Ioffe, R.G Pinsky (1994), *Positive harmonic functions vanishing on the boundary for the Laplacian in unbounded horn-shaped domains*, Transactions of American Mathematical Society., **342**, 773-791.
- 5) D. Ioffe (1994), *Large deviations for the 2D Ising model: a lower bound without cluster expansions*, Journal of Statistical Physics, **74**, 411-432
- 6) D. Ioffe (1995) *Exact large deviation bounds up to  $T_c$  for the Ising model in two dimensions*, Probability Theory and Related Fields, **102**, 313-330.
- 7) D. Ioffe (1996) *A note on the extremality of the disordered state for the Ising model on the Bethe lattice*, Letters in Mathematical Physics, **37**, 137-143.
- 8) E. Bolthausen, D. Ioffe (1997), *Harmonic crystal on the wall: a microscopic approach*, Communications in Mathematical Physics, **187**, 523-566.
- 9) D. Ioffe (1998), *Ornstein-Zernike behaviour and analyticity of shapes for self-avoiding walks on  $\mathbf{Z}^d$* , Markov Processes and Related Fields, **4**, 323-350.
- 10) D.Ioffe, R.H. Schonmann (1998), *Dobrushin-Kotecký-Shlosman theorem up to the critical temperature*, Communications in Mathematical Physics., **199**, 117-167.

- 11) J-D. Deuschel, G. Giacomin, D. Ioffe (2000), *Large deviation and concentration properties for a class of  $\nabla\phi$  interface models*, Probability Theory and Related Fields, **117**,1, 49-111 .
- 12) D. Ioffe, Y. Velenik (2000), *A note on the decay of correlations under  $\delta$ -pinning*, Probability Theory and Related Fields, **116**,3, 379-389.
- 13)\* Th. Bodineau, D. Ioffe, Y. Velenik (2001) *Winterbottom construction for finite range ferromagnetic models: an  $L_1$ -approach*, Journal of Statistical Physics, **105**, 1-2, 93-131.
- 14) D. Ioffe (2002), *A note on the quantum version of the Widom-Rowlinson model*, Journal of Statistical Physics, **106**, 1-2, 375-384.
- 15)\* D. Ioffe, S. Shlosman, Y. Velenik (2002), *2D models of statistical physics with continuous symmetry: the case of singular interactions*, Communications in Mathematical Physics, **226**, 433-454.
- 16) M. Campanino, D. Ioffe (2002) , *Ornstein-Zernike theory the Bernoulli bond percolation on  $\mathbf{Z}^d$* , Ann.Probab. **30**, 2, 652-682.
- 17)\* M.Campanino, D. Ioffe, Y. Velenik (2003), *Rigorous non-perturbative Ornstein-Zernike theory for Ising ferromagnets*, Europhysics Letters, **62**, 182-188.
- 18)\* M.Campanino, D. Ioffe, Y. Velenik (2003), *Ornstein-Zernike theory for finite range Ising models above  $T_c$* , Probability Theory and Related Fields **125**, 305-349.
- 19)\* P. Caputo, D. Ioffe (2003), *Finite volume approximation of the effective diffusion matrix: the case of independent bond disorder*, Annales de l'Institut Henry Poincare Probability and Statistics, **39**, 3, 505-525.
- 20) O. Hryniv, D. Ioffe (2004), *Self-avoiding polygons: sharp asymptotics of canonical partition functions under the fixed area constraint*, Markov Processes and Related Fields **10**, 1, 1-64.
- 21) M. Campanino, D. Ioffe, Y. Velenik (2004), *Random path representation and sharp correlations asymptotics at high-temperatures. Stochastic analysis of large scale interacting systems*, Advanced Studies in Pure Mathematics, 39, 29-52, Math. Soc. Japan, Tokyo.
- 22) Th. Bodineau, D. Ioffe (2004), *Stability of interfaces and stochastic dynamics in the regime of partial wetting*, Annales de l'Institut Henry Poincare Physique theorique, **5**, 871-914.
- 23)\* L. Greenberg, D. Ioffe (2005), *On an invariance principle for phase separation lines*, Annales de l'Institut Henry Poincare Probability and Statistics, **45**, 871-885.
- 24) D. Ioffe, Y. Velenik, M. Zahradnik (2006), *Entropy-driven phase transition in a polydisperse hard-rods lattice system*, Journal of Statistical Physics, **122**, 4, 761-786.
- 25)\* D. Ioffe, A. Levit (2007), *Long range order and giant component of quantum random graphs*, Markov Processes and Related Fields **13**, 3, 469-492.
- 26) D. Ioffe, S. Shlosman (2008), *Ising model fog drip: the first two droplets*, In and Out of Equilibrium 2, Progress in Probability, **60**, 365-381, Birkhäuser Verlag Basel/Switzerland.
- 27) M. Campanino, D. Ioffe, Y. Velenik (2008), *Fluctuation theory of connectivities in sub-critical random cluster models*, Ann.Probab. **36**, 4, 1287-1321.
- 28)\* L. Chayes, N. Crawford, D. Ioffe, A. Levit (2008), *The phase diagram of the quantum Curie-Weiss model*, J. Stat. Phys. **133**, no. 1, 131-149.
- 29)\* A. Bianchi, A. Bovier, D. Ioffe (2009), *Sharp asymptotics for metastability in the random field Curie-Weiss model* , EJP 14, 1541-1603.

- 30) D. Ioffe, Y. Velenik (2010), *The statistical mechanics of stretched polymers*, Braz. J. Probab. Stat. **24**, 2, 279–299.
- 31)\* N. Crawford, D. Ioffe (2010), *Random current representation for transverse field Ising models*, Comm. Math. Phys. **296**, 2, 447–474.
- 32)\* M. Campanino, D. Ioffe and O. Louidor (2010), *Finite connections for supercritical Bernoulli percolation in 2D*, Mark. Proc. Rel. Fields **16**, 225–266.
- 33)\* A. Bianchi, A. Bovier, D. Ioffe (2012), *Pointwise estimates and exponential laws in metastable systems via coupling methods*, Ann.Prob. **40**, 1, 339–371.
- 34) D. Ioffe, Y. Velenik (2012), *Crossing random walks and stretched polymers at weak disorder*, Ann.Probab. **40**, 2, 714–742.
- 35) D. Ioffe, Y. Velenik (2012), *Self-attracting random walks: The case of critical drifts*, Comm. Math. Phys. **313**, 209–235.
- 36) D. Ioffe and A. Levit (2013), *Ground states for mean field models with a transverse component*, J.Stat.Phys. **151**, 6, 1140–1161.
- 37) D. Ioffe and Y. Velenik (2013), *An almost sure CLT for stretched polymers*, EJP. **18**, 97, 1–20.
- 38) S. Friedli, D. Ioffe and Y. Velenik (2013), *Subcritical percolation with a line of defects*, Ann.Prob. **41**, 3B, 2013–2046.
- 39) L. Coquille, H. Duminil-Copin, D. Ioffe and Y. Velenik, Y. (2014), *On the Gibbs state of the noncritical Potts model on  $Z^2$* , Prob. Theor. Rel. Fields. **158**, 1-2, 477–512.
- 40) D. Ioffe, S. Shlosman and F. Toninelli (2015), *Interaction versus entropic repulsion for low temperature Ising polymers*, J. Stat. Phys. **158**, 5, 10071050. to appear in J. Stat.Phys.
- 41) D. Ioffe, S. Shlosman and Y. Velenik (2015), *An invariance principle to Ferrari-Spohn diffusions*, Comm. Math. Phys. **336**, 2, 905–932.
- 42) H. Duminil-Copin, D. Ioffe and Y. Velenik (2016), *A quantitative Burton-Keane estimate under strong FKG condition*, Annals of Probability, **44**, 5, 3335–3356.
- 43) D. Ioffe, Y. Velenik, and V. Wachtel (2017), *Dyson Ferrari-Spohn diffusions and ordered walks under area tilts*, Probab. Theory Relat. Fields. doi:10.1007/s00440-016-0751-z

## Review Papers

- 44)\* Th. Bodineau, D. Ioffe and Y. Velenik (2000) *Rigorous probabilistic analysis of equilibrium crystal shapes*, Journal of Mathematical Physics, **41**, 1033-1098.
- 45) D. Ioffe (2009), *Stochastic geometry of classical and quantum Ising models*, Methods of Contemporary Mathematical Statistical Physics, R. Kotecky ed., 87–128, LNM 1970, Springer,
- 46) D. Ioffe and Y. Velenik (2012), *Stretched polymers in random environment*, in Probability in Complex Physical Systems, in honour of E. Bolthausen and J. Gärtner, J.-D. Deuschel et al. (eds), Springer Proceedings in Mathematics 11, 339–369.
- 47) D. Ioffe (2015), *Multidimensional random polymers: A renewal approach*, in Random Walks, Random Fields, and Disordered Systems, Biskup, M., Cerny, J. and Kotecky, R. editors, LNM 2144, Springer.

### Refereed publications in conference proceedings

- 48) D. Ioffe and R.G. Pinsky (1991), *Asymptotics for the solution of the exterior Dirichlet problem for second-order elliptic operators with small first order perturbations*, Lecture in Applied Mathematics, **27**, 185-191.
- 49) D. Ioffe (1992), *Large deviations for reaction-diffusion equations with rapidly oscillating random noise*, in *Stochastic PDE and Applications*, G. Da Prato and L. Tubaro (Editors), Pitman Research Notes **268**, 239-245.
- 50) D. Ioffe (1996), *Extremality of the disordered state for the Ising model on general trees*, Progress in Probability vol.40, editors B.Chauvin, S.Cohen and A.Rouault, Birkhäuser, 3–14.
- 51) D. Ioffe and Y. Velenik (2008), *Ballistic Phase of Self-Interacting Random Walks*, Analysis and Stochastics of Growth Processes and Interface Models, 55-79, Morters, P., Moser, R., Penrose, M., Schwetlick, H. and Zimmer, J. editors, Oxford University Press.

### Submitted

- 52) D. Ioffe and Y. Velenik, *Low-temperature interfaces: Prewetting, layering, faceting and Ferrari-Spohn diffusions*,  
<https://arxiv.org/pdf/1611.00658v1.pdf>
- 53) D. Ioffe, S. Shlosman, *Formation of facets for an effective model of crystal growth*,  
<https://arxiv.org/pdf/1704.06760.pdf>

### Other

- 54) D. Ioffe (2006), *Random path representation and Ornstein-Zernike theory of fluctuations*, In XIVTH International Congress on Mathematical Physics **1**, World Sci. Publ., Hackensack, NJ, 237–244.
- 55) D. Ioffe and Y. Velenik (2013), *Erratum to: Self-attractive random walks: the case of critical drifts*, Comm. Math. Phys. **323**, 1, 449–450.