Subhajit Goswami

CONTACT INFORMATION

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DATE OF BIRTH

June 30, 1988

CITIZENSHIP

Indian

CURRENT POSITION

Starting from 2017, I am a postdoctoral fellow at Institut des Hautes Études Scientifiques (IHES) in Probability and Mathematical Physics. I work in the group of Professor Hugo Duminil-Copin. I will join the school of mathematics at the Tata Institute of Fundamental Research (TIFR), Mumbai as a Reader in September, 2020.

OTHER POSITIONS

Starting from 2019, I also hold an associate faculty position at the International Centre for Theoretical Sciences (ICTS), Bangalore.

EDUCATION

Ph.D., University of Chicago, September 2012 - August 2017.

Specialization: Probability theory

Thesis title: *Some metric properties of planar Gaussian free field*

Advisor: Prof. Jian Ding

Members of thesis committee: Prof. Jian Ding, Prof. Steven P. Lalley, Prof. Gregory F. Lawler

Master of Statistics (M. Stat.), Indian Statistical Institute, July 2009 - May 2011.

Passed in First Division with Distinction

Specialization: Mathematical Statistics and Probability

Masters thesis: *Excited random walks in one and higher dimensions*

Advisor: Prof. Gopal K Basak

Bachelor of Statistics (B. Stat.), Indian Statistical Institute, July 2006 - May 2009

Passed in First Division with Distinction

RESEARCH INTERESTS

Probability theory and its applications to problems in statistical physics and statistics. Some of my current projects involve understanding percolation phenomena in correlated media like random cluster models, random interlacement and level-sets of gaussian free field among others. I am also very interested in mathematical statistics, specifically the interface of probability theory, statistics and optimization.

HONORS

1. Recipient of Department of Statistics consulting award for 2013 – 2014, University of Chicago.

2. Recipient of McCormick Fellowship, University of Chicago, 2012 – 2014.

3. Recipient of Paul Meier Fellowship, Department of Statistics, University of Chicago.

4. Recipient of Dr. Shyama Prasad Mukherjee (SPM) Fellowship, Government of India.

5. Recipient of MA/MSc Scholarship from Department of Atomic Energy, Govt. of India, 2010 – 2011.

Publications

1. H. Duminil-Copin, S. Goswami, A. Raoufi, F. Severo and A. Yadin. Existence of phase transition for percolation using the Gaussian Free Field. To appear in *Duke Math. J. Preprint* is available at arxiv.org/abs/1806.07733.

2. H. Duminil-Copin, S.Goswami and A. Raoufi. Exponential decay of truncated correlations for the Ising model in any dimension for all but the critical temperature. *Commun. Math. Phys.* **374,** 891–921 (2020). *Preprint* is available at arxiv.org/abs/1808.00439.

3. M. Biskup, J. Ding and S. Goswami. Return probability and recurrence for the random walk driven by two-dimensional Gaussian free field. *Commun. Math. Phys.* **373,** 45–106 (2020). *Preprint* is available at arxiv.org/abs/1611.03901.

4. J. Ding and S. Goswami. Upper bounds on Liouville first passage percolation and Watabiki's prediction. *Commun. Pure Appl. Math.*, 72, no. 11 (2019): 2331-2384. *Preprint* is available at arxiv.org/abs/1610.09998.

5. J. Ding and S. Goswami. First passage percolation on the exponential of two-dimensional branching random walks. *Electron. Commun. Probab.* 22 (2017), no. 69.

6. J. Ding and S. Goswami. Percolation of averages in the stochastic mean field model: the near-supercritical regime. *Electron. J. Probab.* 20 (2015), no. 124.

Preprints

1. H. Duminil-Copin, S. Goswami, P-F. Rodriguez and F. Severo. Equality of critical parameters for percolation of Gaussian free field level-sets. *Preprint*, available at arxiv.org/abs/2002.07735.

2. S. Chatterjee and S. Goswami. Adaptive Estimation of Multivariate Piecewise Polynomials and Bounded Variation Functions by Optimal Decision Trees. *Preprint*, available at arxiv.org/abs/1911.11562.

3. S. Chatterjee and S. Goswami. New Risk Bounds for 2D Total Variation Denoising. *Preprint*, available at arxiv.org/abs/1902.01215.

4. J. Ding and S. Goswami. Liouville first passage percolation: the weight exponent is strictly less than 1 at high temperature. *Preprint*, available at arxiv.org/abs/1605.08392. This article gives a different proof for a weaker bound on the exponent compared to arxiv:1610.09998.

5. S. Goswami. Finite size scaling of random XORSAT. *Preprint*, available at arxiv.org/abs/1610.07431.

Presentations

1. (Invited talk) *Anomalous diffusion on the GFF landscape.* Meeting of the Swiss Mathematical Society: Recent advances in loop models and height functions, September 2-4, 2019, University of Fribourg, Fribourg, Switzerland.

2. (Invited talk) *Percolation theory: from classical to dependent models.* Special colloquium, August 13, 2019, School of Mathematics, Tata Institute of Fundamental Research (TIFR), Mumbai, India.

3. (Invited talk) *Percolation theory: from classical to dependent models.* Department seminar, July 26, 2019, Department of Mathematics, Indian Institute of Science, Bengaluru, India.

4. (Invited talk) *Percolation theory: from classical to dependent models.* Department colloquium, July 23, 2019, Theoretical Statistics and Mathematics Unit, Indian Statistical Institute, Bengaluru, India.

5. (Invited talk) *Anomalous diffusion on the GFF landscape.* Probability seminar, July 22, 2019, International Centre for Theoretical Sciences, Bengaluru, India.

6. (Invited talk) *Sharpness of level-set percolation for the Gaussian free field.* Stochastic

Processes and its Applications Conference (SPA), July 8-12, 2019, Northwestern University, Evanston, IL, USA (could not attend due to visa related problems).

7.(Invited talk) *New Risk Bounds for 2D Total Variation Denoising.* Séminaire de probabilités-statistiques, March 21, 2019, Dpartement de Mathématiques d'Orsay, Orsay, France.

8.(Invited talk) *The truncated correlations of the Ising model in any dimension decay exponentially fast at all but the critical temperature.* Séminaire de probabilités-statistiques, Ocotober 18, 2018, Dpartement de Mathématiques d'Orsay, Orsay, France.

9.(Invited talk) *The truncated correlations of the Ising model in any dimension decay exponentially fast at all but the critical temperature.* Probability seminar, March 21, 2018, International Centre for Theoretical Sciences, Bengaluru, India.

10. (Invited talk) *Liouville first-passage percolation and Watabiki's prediction.* Department seminar, March 19, 2018, Department of Mathematics, Indian Institute of Science, Bengaluru, India.

11. (Invited talk) *Some metric properties of 2-D Gaussian free field.* Séminaire de probabilités et physique statistique de l'IHES, October 31, 2017, Institut des Hautes Études Scientifiques (IHES), Bures-Sur-Yvette, France.

12. (Contributed paper talk) *Liouville first-passage percolation and Watabiki's prediction.* Oberwolfach Seminar: Scaling Limits of Random Planar Maps and Liouville Quantum Gravity, October 15 – October 21, 2017, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany.

13. (Invited talk) *Liouville first-passage percolation and Watabiki's prediction.* Random Matrix & Probability Theory Seminar, April 12, 2017, Center for Mathematical Sciences and Applications, Harvard University, Cambridge, MA.

14. (Invited talk) *Liouville first-passage percolation and Watabiki's prediction.* Probability seminar, February 9, 2017, Department of Mathematics, UCLA, Los Angeles, CA.

15. (Invited talk) *Percolation of averages in the stochastic mean field model: the near-supercritical regime.* Department seminar, January 20, 2016, Statistics and Mathematics unit, Indian Statistical Institute, Kolkata, India.

16. (Contributed paper talk) *Percolation of averages in the stochastic mean field model: the near-supercritical regime.* Duke conference on Probability Theory and Combinatorial Optimization, March 14 – 15, 2015, Duke University, Durham, NC.

Peer Review Services

Reviewer for *Mathematical Reviews*, American Mathematical Society. Refereed for *Electronic Journal of Probability (EJP)*, *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques (AIHP)*, *Probability Theory and Related Fields (PTRF)*, *Communications in Mathematical Physics (CIMP)*, *Annales Henri Lebesgue (AHL)* and *International Mathematics Research Notices (IMRN)*.

Teaching Experience

While at the University of Chicago, I was an instructor of Stat 234 (Statistical Models and Methods I) in Spring 2015. I served as a teaching assistant for the following courses in University of Chicago:

1. Stat 244 (Statistical Theory/Method-1) - Autumn 2016.

2. Stat 383 (Measure-Theoretic Probability-III) - Spring 2016.

3. MATH 38511 (Brownian Motion and Stochastic Calculus) - Autumn 2015.

4. Stat 385 (Brownian Motion and Stochastic Calculus) - Autumn 2014.

5. Stat 251 (Introduction to Mathematical Probability) - Spring 2014.

6. Stat 312 (Introduction to Stochastic Processes-1) - Autumn 2013.

7. Stat 234 (Statistical Models/Methods-1) - Autumn 2012 and Spring 2013.

References

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Professor, Université de Genève
Section de mathématiques
2-4 rue du Lièvre
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