

Curriculum Vitæ

Arvind Ayyer

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Address

Institut de Physique Théorique
CEA Saclay
Bât. 774 Orme des Merisiers
91191 Gif-sur-Yvette Cedex
France

Office Phone: 01-69-08-67-15
Fax: (attn: Arvind Ayyer) 01-69-08-81-20
Email: arvind.ayyer@cea.fr
Webpage: <http://www.math.rutgers.edu/~ayyer/home>

Education

2008-present	Postdoctoral Research Scientist	Institut de Physique Theorique, CEA Saclay, France.
2003-2008	Ph.D	Physics, Rutgers University, USA under the joint supervision of Prof. Joel L. Lebowitz and Prof. Doron Zeilberger titled <u>Statistical Mechanics and Combinatorics of Some Discrete Lattice Models.</u>
1998-2003	MS	Physics, Indian Institute of Technology Kanpur, India.

Publications

1. (with Alok Sharan, Ramesh Sharma, S. N. Sandhya, K. K. Sharma)
Modeling absorption in saturable absorbers, *Optics Communications*,
199 (2001), no. 1-4, 267–275.

2. (with Mahendra K. Verma, Amar V. Chandra, Olivier Debligny and Shishir Kumar) Local Shell-to-Shell Energy Transfer via Nonlocal Interactions in Fluid Turbulence, *Pramana*, **65** (2005), 297–310.
3. (with Mahendra K. Verma and Amar V. Chandra) Energy Transfer and Locality in Magnetohydrodynamic Turbulence, *Phys. Plasmas*, **12** (2005), 082307 (7pp).
4. (with Tewodros Amdeberhan) Towards The Moduli Space of Extended Partial Isometries, *Preprint*, <http://arxiv.org/abs/hep-th/0508014>.
5. (with D. Zeilberger) The Number of [Old-Time] Basketball games with Final Score $n:n$ where the Home Team was never losing but also never ahead by more than w Points, *Electronic J. of Combinatorics* **14** (2007), no. 1, R19 (8pp).
6. (with D. Zeilberger) Two Dimensional Directed Lattice Walks with Boundaries, *Tapas in Experimental Mathematics*, Contemporary Mathematics, edited by Tewodros Amdeberhan and Victor Moll, 1–19, (2007).
7. (with Mikko Stenlund) Exponential Decay of Correlations for Randomly Chosen Hyperbolic Toral Automorphisms, *Chaos*, **17** (2007), 043116, 7pp.
8. The Half-Perimeter Generating Function of Gated and Wicketed Ferrers diagrams, *Journal of Integer Sequences*, **10** (2007), no. 10, 07.10.3, 11pp.
9. (with Carlangelo Liverani and Mikko Stenlund) Quenched CLT for Random Toral Automorphisms, *Discrete and Continuous Dynamical Systems, A*, **24** (2009) no. 2, 331–348.
10. Towards a human proof of Gessel’s conjecture, *Journal of Integer Sequences*, **12** (2007), no. 4, 09.4.2, 15pp.
11. (with Joel Lebowitz and E. R. Speer) On the Asymmetric Exclusion Process with Semi-Permeable Boundaries, *Journal of Statistical Physics*, **135** (2009), no 5–6, 1009–1037.
12. (with E. A. Carlen, J. L. Lebowitz, P. K. Mohanty, D. Mukamel and E. Speer) Phase diagram of the ABC model on an interval, *Journal of Statistical Physics*, to appear, [arXiv:0905.4849](https://arxiv.org/abs/0905.4849).
13. (with Doron Zeilberger) A Bijectional Attack on the Razumov-Stroganov Conjecture, *submitted*, [arXiv:0902.2329](https://arxiv.org/abs/0902.2329).

14. A Protobijection between Alternating Sign Matrices and Descending Plane Partitions, *submitted*, [arXiv:0909.4732](#).
15. (with Kirone Mallick) Exact results for an asymmetric annihilation process with open boundaries, *submitted*, [arXiv:0910.0693](#).
16. (with Philippe Di Francesco) A monomial basis for the quantum Knizhnik-Zamolodchikov equation, *in preparation*.
17. (with Robert Cori) The number of alternating sign matrices with a unique minus, *in preparation*.

Talks and Posters

Talks

1. Some Combinatorial Identities from Noncommutative Field Theory, *Experimental Mathematics Seminar*, Rutgers University, Jan 26 2006.
2. Experimental Mathematics to the Aid of Theoretical Physics, *Experimental Mathematics Seminar*, Rutgers University, Oct 12 2006.
3. Randomly Chosen Hyperbolic Toral Automorphisms, *97th Statistical Mechanics Conference*, Rutgers University, May 7, 2007.
4. The Razumov-Stroganov Conjecture: A Combinatorial Approach, *Mathematical Physics Seminar*, Institut de Physique Théorique, CEA Saclay, February 16, 2009 and Combinatorics Seminar, Laboratoire d'Informatique, Ecole Polytechnique, March 3, 2009.
5. Gessel's Lattice Path Conjecture and Dyck Paths, *Séminaire Lotharingien de Combinatoire*, Bertinoro, September 29, 2009.
6. Descending Plane Partitions and Permutations, *Two-dimensional lattice models: Statcomb 2009*, Institut Henri Poincaré, October 8, 2009.

Posters

1. Constrained Directed Two Dimensional Walks, presented in *Combinatorial Problems Raised by Statistical Mechanics*, part of the *Recent Advances in Combinatorics* theme semester, Centre de Recherches Mathématiques, Université de Montréal, Canada, Feb 19–23, 2007.

2. Exponential Decay of Correlations for Randomly Chosen Hyperbolic Toral Automorphisms, presented in *Statphys23, XXIII IUPAP International Conference on Statistical Physics*, Genova, Italy, July 9–13, 2007.

Honors

1. *General Proficiency Medal for Best Academic Performance in Physics* for the Graduating Class of 2003, Indian Institute of Technology Kanpur Convocation, May 30, 2003.
2. *Teaching Assistantship*, Department of Physics and Astronomy, Rutgers University, Fall 2003 to Spring 2006.
3. *Graduate Assistantship*, Department of Physics and Astronomy, Rutgers University, Fall 2006 to Summer 2008.

Additional Information

1. Citizen of India.
2. Human Languages - English, Hindi, Tamil, Gujarati.
3. Computer Languages - C, C++, L^AT_EX, Maple.

References

1. Prof. Joel L. Lebowitz, Rutgers University.
2. Prof. Doron Zeilberger, Rutgers University.
3. Prof. E. R. Speer, Rutgers University.