

# CV of S. M. Bhattacharjee

## *Name/Address:*

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*Date of birth:* 24 January 1957    *Citizenship:* Indian

## *Educational qualifications:*

- Ph. D, Carnegie Mellon University, USA, 1980-84
- M. Sc., Calcutta University, India
- B. Sc., Calcutta University, India

## *Details of research experience:*

1. Post-doc, Polymer Engg, Univ. Massachusetts, Amherst, USA, 1984-86
2. Post-doc, AT&T Bell Labs, Murray Hill, USA, 1986-88

## *Details of employment.:*

1. Professor, Institute of Physics, Bhubaneswar, 2004-
2. Assoc. Professor, Institute of Physics, Bhubaneswar, 1998-2004
3. Asst. Professor, Institute of Physics, Bhubaneswar, 1992-98
4. Senior Lecturer, Institute of Physics, Bhubaneswar, 1988-92
5. Lecturer, M. M. C. College, Calcutta, 1979-80

## *Professional recognitions*

1. Fellow, Indian Academy of Sciences, Bangalore, since 2000
2. Fellow, INSA, New Delhi, since 2008
3. J. C. Bose Fellowship, 2010

## *Courses Taught*

Mathematical methods, Quantum mechanics, Electrodynamics, Statistical Mechanics, Solid state Physics, Numerical methods.

Advanced Courses: Phase transitions, Spin glass, Special topics of condensed matter physics, Topology and Physics (ongoing).

Short Courses on topics of statistical physics taught on invitation at SMIT (Sikkim), Viswa Bharati(Santiniketan), several SERC schools.

Complete List of publications of S. M. Bhattacharjee

85. Tanmoy Pal, Poulomi Sadhukhan, and S. M. Bhattacharjee [Phys. Rev. Lett. 110, 028105 \(2013\)](#)  
**Title:** *Renormalization Group Limit Cycle for Three-Stranded DNA*
84. Garima Mishra, Poulomi Sadhukhan, S. M. Bhattacharjee, and Sanjay Kumar [PRE 87, 022718 \(2013\)](#)  
**Title:** *Dynamical phase transition of a periodically driven DNA*
82. Poulomi Sadhukhan and S. M. Bhattacharjee [J. Phys. A: Math. Theor. 45 \(2012\) 425302](#)  
**Title:** *Signature of special behaviors of  $1/r^2$  interaction in the quantum entanglement entropy*
83. Jaya Maji and S. M. Bhattacharjee [Phys. Rev. E 86, 041147 \(2012\)](#)  
**Title:** *Efimov effect of triple-stranded DNA: Real-space renormalization group and zeros of the partition function*
81. Poulomi Sadhukhan and S. M. Bhattacharjee [EPL 98 \(2012\) 10008](#)  
**Title:** *Entanglement entropy of a quantum unbinding transition and entropy of DNA*
80. Poulomi Sadhukhan, Jaya Maji and S. M. Bhattacharjee [EuroPhys. Letts. 95 \(2011\) 48009](#)  
**Title:** *Type II DNA: When the interfacial energy becomes negative*
79. Jaya Maji and S. M. Bhattacharjee [EuroPhys. Letts. 92 \(2010\) 58004](#)  
**Title:** *Dynamic phase transition in the conversion of B-DNA to Z-DNA*
78. Jaya Maji, S. M. Bhattacharjee, F. Seno, A. Trovato [New J. Phys. 12 \(2010\) 083057](#)  
**Title:** *When a DNA triple helix melts: an analogue of the Efimov state*
77. Poulomi Sadhukhan and S. M. Bhattacharjee [J. Phys. A: Math. Theor. 43 \(2010\) 245001](#)  
**Title:** *Thermodynamics as a nonequilibrium path integral*
76. S. M. Bhattacharjee [J. Phys.: Condens. Matter 22 155102 \(2010\)](#) (in IOPSELECT)  
**Title:** *Interfacial instability and DNA fork reversal by repair proteins*
75. Navinder Singh and S. M. Bhattacharjee [Physics Letters A 373 \(2009\) 3113](#)  
**Title:** *Transverse diffusion induced phase transition in asymmetric exclusion process on a surface*
74. R. Kapri S. M. Bhattacharjee [EuroPhys. Letts. 83, 68002 \(2008\)](#)  
**Title:** *Manipulating a single adsorbed DNA for a critical endpoint*

73. S. M. Bhattacharjee In "Continuous Models and Discrete Systems" Ed by D. Julein published by Ecole des mine, Paris, 2007  
**Title:** *Duality in one dimensional transport: Boundary layer approach*
72. Jaya Maji and S. M. Bhattacharjee [Europhysics Letters. 81 \(2008\) 30005](#)  
**Title:** *Nonequilibrium tricriticality in one dimension*
71. R. Kapri and S. M. Bhattacharjee [Physica A: Stat Mech and its Appl 384, 10 \(2007\)](#)  
**Title:** *Bubbles in DNA by random force*
70. Rajeev Kapri, S. M. Bhattacharjee [Phys. Rev. Lett. 98, 098101 \(2007\)](#)  
**Title:** *Randomly forced DNA*
69. S. M. Bhattacharjee [J. Phys. A 40 \(2007\) 1703-1710](#)  
**Title:** *Duality and phase diagram of one-dimensional transport*
68. R. Kapri and S. M. Bhattacharjee [J. Phys.: Condens. Matter 18 \(2006\) S215](#)  
**Title:** *Unzipping DNA by force: thermodynamics and finite size behaviour*
67. Soumen Roy and S. M. Bhattacharjee [Phys. Letts. A 352 \(2006\) 13](#)  
**Title:** *Is small-world network disordered?*
66. Rajeev Kapri and S. M. Bhattacharjee [Phys. Rev. E 72, 051803 \(2005\)](#)  
**Title:** *Unzipping an adsorbed polymer in a dirty or random environment*
65. S. M. Bhattacharjee in "Statistics of Linear Polymers in Disordered Media", ed. by B.K. Chakrabarti, Elsevier 2005  
**Title:** *Directed polymers and Randomness*
64. Sutapa Mukherji, S. M. Bhattacharjee [J. Phys. A Letters. 38 \(2005\) L285](#)  
**Title:** *Nonequilibrium Criticality at Shock Formation in Steady States*
63. S. Kumar, D. Giri and S. M. Bhattacharjee [Phys. Rev. E71, 051804 \(2005\)](#)  
**Title:** *Force induced triple point for interacting polymers*
62. R. Kapri, S. M. Bhattacharjee and F. Seno [Phys. Rev. Lett. 93, 248102 \(2004\)](#)  
**Title:** *Complete phase diagram of DNA unzipping: Eye, Y fork, and triple point*
61. S. M. Bhattacharjee [Physics Teacher. 45, 12 \(2003\)](#)  
**Title:** *Entropy and perpetual computers*

60. S. M. Bhattacharjee [Europhysics Letts. 65, 574 \(2004\)](#)  
**Title:** *Helicase activity on DNA as a propagating front*
59. S. M. Bhattacharjee and F. Seno [J. Phys. A 36, L181 \(2003\)](#)  
**Title:** *Helicase on DNA: a phase coexistence based mechanism*
58. S. M. Bhattacharjee and D. Marenduzzo [J. Phys. A 35, L141 \(2002\)](#)  
**Title:** *DNA sequence from the unzipping force? One mutation problem*
57. Parongama Sen and S. M. Bhattacharjee [J. Phys. A 35, L141 \(2002\)](#)  
**Title:** *Is there a true Model-D critical dynamics?*
56. S. M. Bhattacharjee [Europhys. Lett. 57, 772 \(2002\)](#)  
**Title:** *Comment on "A simple model for DNA denaturation"*
55. D. Marenduzzo, S. M. Bhattacharjee, A. Maritan, E. Orlandini and F. Seno  
[Phys. Rev. Lett. 88, 028102 \(2002\)](#)  
**Title:** *Dynamical scaling of the DNA unzipping transition*
54. E. Orlandini, S. M. Bhattacharjee, D. Marenduzzo, A. Maritan and F. Seno [J. Phys. A 34, L751 \(2001\)](#)  
**Title:** *Mechanical denaturation of DNA: existence of a low temperature denaturation*
53. S. M. Bhattacharjee and F. Seno [J. Phys. A 34, 6375 \(2001\)](#)  
**Title:** *A measure of data collapse for scaling*
52. S. M. Bhattacharjee in "Field theoretic methods in condensed matter physics"  
(SERC school lecture notes Hindusthan Publishing 2001/IOP UK 2003)  
**Title:** *Critical Phenomena: An Introduction from a modern perspective*
51. S. Mukherji and S. M. Bhattacharjee, [Phys. Rev. E 63, 051103 \(2001\)](#)  
**Title:** *Reunion of random walkers with a long range interaction: applications to polymers and quantum mechanics*
50. S. M. Bhattacharjee, [Ind. J. of Phys. A. 76A, 69 \(2002\)](#)  
**Title:** *Unzipping of DNA: A hypothesis on correlation during replication*
49. S. M. Bhattacharjee, [J. Phys. A 33, L423 \(2000\).](#)  
**Title:** *Unzipping DNAs: towards the first step of replication*

48. S. M. Bhattacharjee and S. Mukherji [Phys. Rev. Lett. 83, 2374 \(1999\)](#)  
**Title:** *Vicinal Surfaces, fractional statistics, and universality*
47. S. Mukherji and S. M. Bhattacharjee [Curr. Sci. 77, 394 \(1999\)](#).  
**Title:** *Nonequilibrium growth problems*
46. S. M. Bhattacharjee and S. Mukherji [J. Phys. A 31, L695 \(1998\)](#).  
**Title:** *Incommensuration in quantum antiferromagnetic chain*
45. S. M. Bhattacharjee, T. Nattermann and C. Ronnewinkel [Phys. Rev. B 58, 2658 \(1998\)](#).  
**Title:** *Incommensurate phase of the pure and doped spin-Peierls system CuGeO<sub>3</sub>*
44. S. Mukherji and S. M. Bhattacharjee [Phys. Rev Lett 79, 2502 \(1997\)](#)  
**Title:** *Nonlocality in kinetic roughening*
43. S. M. Bhattacharjee, and A. Baumgärtner [J. Chem. Phys. 107, 7571 \(1997\)](#)  
**Title:** *Dynamics of unbinding of polymers in a random medium*
42. A. Baumgärtner and S. M. Bhattacharjee [J. Chem. Phys. 107, 4390 \(1997\)](#)  
**Title:** *Adsorption of fluid vesicles*
41. S. Mukherji and S. M. Bhattacharjee [Physica A 245, 534 \(1997\)](#)  
**Title:** *Deadlocks and waiting times in traffic jams*
40. S. M. Bhattacharjee [Phys. Rev. Lett 76, 4568 \(1996\)](#).  
**Title:** *Theory of tricriticality for miscut surfaces*
39. S. Mukherji and S. M. Bhattacharjee, [Phys. Rev. B53 \(Rap. Com\) R6002 \(1996\)](#)  
**Title:** *Infinite number of exponents for a spin glass transition*
38. S. Mukherji, S. M. Bhattacharjee and A. Baumgärtner [J. Phys. A 29, L115 \(1996\)](#).  
**Title:** *Scaling of fluctuation for directed polymers with random interaction*
37. S. Suresh Rao and S. M. Bhattacharjee, [Physica A 224, 279 \(1996\)](#).  
**Title:** *Protein folding and Spin glass*
36. S. M. Bhattacharjee and S. Mukherji, [Physica A 224, 239 \(1996\)](#).  
**Title:** *Polymers with randomness: Phases and Phase transitions*

35. S. M. Bhattacharjee and Avinash Khare *Curr. Sci.* 69, 816 (1995)  
**Title:** *Fifty Years of the Exact Solution of the Two-Dimensional Ising Model by Onsager*
34. S. M. Bhattacharjee and S. Mukherji, *Phys. Rev. E* 52, 4860 (1995)  
**Title:** *Finite size correction in a disordered system: a new divergence*
33. S. Mukherji and S. M. Bhattacharjee, *Phys. Rev. E* 52, 1930 (1995)  
**Title:** *Failure of the Harris criterion for directed polymers on hierarchical lattices*
32. S. M. Bhattacharjee, *Mod. Phys. Lett.* 8, 127 (1994).  
**Title:** *Ising Transition temperatures for quasicrystals: Does the topology matter*
31. S. Mukherji and S. M. Bhattacharjee, *Phys. Rev. E* 48, 3483 (1993)  
**Title:** *Directed polymers with random interaction: An exactly solvable model*
30. S. Mukherji and S. M. Bhattacharjee *Phys. Rev. E* 48, 3427 (1993)  
**Title:** *Reunion and survival of interacting walkers*
29. S. Mukherji and S. M. Bhattacharjee, *J. Phys. A* 26, L1139 (1993)  
**Title:** *Reunion of vicious walkers: results from  $\epsilon$  expansion*
28. S. M. Bhattacharjee and S. Mukherji, *J. Phys. A* 26, L423 (1993)  
**Title:** *Loop mediated crossover in three dimensional Ising model*
27. S. M. Bhattacharjee and S. Mukherji, *Phys. Rev. Letts.* 70, 49 (1993)  
**Title:** *Directed polymers with random interaction: marginal relevance and novel criticality*
26. S. M. Bhattacharjee, *Physica A* 186, 183 (1992)  
**Title:** *Directed walks and vertex models: renormalization, multicriticality and beyond*
25. S. M. Bhattacharjee and J. J. Rajasekaran, *Phys. Rev. A* 46, R703 (1992)  
**Title:** *Multicritical two-dimensional vertex models*
24. S. M. Bhattacharjee and S. Suresh Rao, *J. Phys. A* 25, L901 (1992)  
**Title:** *Randomness in vertex models and directed walks*
23. S. Suresh Rao and S. M. Bhattacharjee, *Phys. Rev. A* 45, 670 (1992)  
**Title:** *Square tiling model for glass transition: a transfer matrix approach for the competing energy*
22. S. M. Bhattacharjee and J. J. Rajasekaran, *J. Phys. A* 24, L1217 (1991)

- Title:** *Vertex models and directed walks: length scale exponents from finite size scaling*
21. S. M. Bhattacharjee and J. J. Rajasekaran, *Phys. Rev. A* 44, 6202 (1991)  
**Title:** *Absence of anomalous dimension in vertex models: semidilute solution of directed polymers*
  20. S. M. Bhattacharjee, *Physica A* 186, 183 (1992)  
**Title:** *Directed walks and vertex models: renormalization, multicriticality and beyond*
  19. S. M. Bhattacharjee, *Europhys. Lett.* 15, 815 (1991)  
**Title:** *Vertex model in d dimensions: an exact result*
  18. S. M. Bhattacharjee and B. K. Chakrabarti, *Europhys. Lett.* 15, 259 (1991)  
**Title:** *A polymer chain in an annealed random medium: the puzzle of Fisher renormalization*
  17. J. J. Rajasekaran and S. M. Bhattacharjee, *J. Phys. A* 24, L371 (1991)  
**Title:** *Exact fixed point for directed random walks*
  16. S. M. Bhattacharjee, *Z. Phys.* B82, 323 (1991)  
**Title:** *Exact matrix representation of the RVB wave function*
  15. B. K. Chakrabarti and S. M. Bhattacharjee, *J. Stat. Phys.* 58, 383 (1990)  
**Title:** *Theta point exponent for polymer chain in random media*
  14. S. M. Bhattacharjee and G. H. Fredrickson, *Phys. Rev. A* 41, 3372 (1990)  
**Title:** *Single polymer chain in extensional flow:  $n \rightarrow 0$  model*
  13. J. F. Nagle, C. S. O. Yokoi and S. M. Bhattacharjee, in *Phase transitions and Critical Phenomena*,  
Vol 13 ed. by C. Domb and J. Lebowitz (Academic Press, 1989)  
**Title:** *Dimer models on anisotropic lattices*
  12. S. M. Bhattacharjee, *Phys. Rev. A* 40, R7424 (1989)  
**Title:** *Glass transition, competing energy and the tiling model*
  11. E. Helfand, S. M. Bhattacharjee and G. H. Fredrickson, *J. Chem. Phys.* 91, 7200 (1989)  
**Title:** *Molecular weight dependence of the interfacial tension and the density profile of a binary polymer mixture*
  10. S. M. Bhattacharjee, E. Helfand and G. H. Fredrickson, *J. Chem. Phys.* 90, 3305 (1989)  
**Title:** *Phase separation of polymer solutions in elongational flow*
  9. S. M. Bhattacharjee and E. Helfand, *Phys. Rev. A* 36, 3332 (1987)  
**Title:** *Equilibrium behavior of the tiling model*
  8. S. M. Bhattacharjee, J. S. Ho and J. A. Y. Johnson, *J. Phys. A* 20, 4439 (1987)

**Title:** *Translational invariance in critical phenomena: Ising model on a Penrose lattice*

7. S. M. Bhattacharjee and M. Muthukumar, *J. Chem. Phys.* 86, 411 (1987)

**Title:** *Statistical mechanics of solutions of semiflexible chains: a path integral formulation*

6. S. M. Bhattacharjee, *Phys. Rev.* B34, 1624 (1986)

**Title:** *Assumption of separability of the excluded volume interaction in polymer physics: Flory Huggins theory reviewed*

5. S. M. Bhattacharjee and J.F. Nagle, *Phys. Rev.* A31, 3199 (1985)

**Title:** *Finite size effect for the critical point of an anisotropic dimer model of domain walls*

4. S. M. Bhattacharjee, *Phys. Rev. Lett.* 53, 1161 (1984)

**Title:** *Crossover in an exactly solvable dimer model of domain walls with dislocations*

3. L. A. Parodi, R. H. Lozier, S. M. Bhattacharjee and J. F. Nagle, *Photochem. Photobiol.* 40, 501 (1984)

**Title:** *Testing of kinetic models for the bacteriorhodopsin photocycle-II. inclusion of an O → M backreaction*

2. J. F. Nagle, S. M. Bhattacharjee, L. A. Parodi and R. H. Lozier, *Photochem. Photobiol.* 38, 331 (1983)

**Title:** *Effect of photoselection upon saturation and the dichroic ratio in flash experiments upon effectively immobilized systems*

1. S. M. Bhattacharjee, J. F. Nagle, D. A. Huse and M. E. Fisher, *J. Stat. Phys.* 32, 361 (1983)

**Title:** *Critical behavior of a three dimensional dimer model*

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#### *Books:*

``Polymer Physics - 25 years of the Edwards model'', Ed, S. M. Bhattacharjee, published by World Scientific, Singapore (1992)

``Models and Techniques of statistical physics'' - Ed. by S. M. Bhattacharjee with S. N. Behera, published by Narosa (1996)