CURRICULUM VITAE

(Last updated on September 11, 2020)

1. Name: Muktish Acharyya
2. Present position: Professor, Department of Physics, Presidency University, 86/1 College Street, Kolkata-700073, INDIA
3. Address:
Department of Physics
Presidency University
86/1 College Street
Kolkata-700073, India
Phone: +91 [0] 33 40529844
E-mail: muktish.physics@presiuniv.ac.in
Website:www.presiuniv.ac.in/web/staff.php?staffid=25
4. Date of Birth: January 7, 1965
5. Nationality: Indian
6. Academic qualification:

B. Sc.(Physics)- University of Kalyani-1986
M. Sc.(Physics)- University of Kalyani-1988 (Exam. held in 1989)
Specialisation in M.Sc.: Solid State Physics.
PhD - Saha Institute of Nuclear Physics(Calcutta University)-1996
NET: Obtained Junior Research Fellowship (JRF) through NET in 1990.
Ph.D thesis: Work done at Saha Institute of Nuclear Physics, Calcutta, India. Thesis title: *Responses of Ising and other dynamical systems to time varying perturbations.* Degree awarded by the University of Calcutta in 1996.

7. Postdoctoral research experiences:

(a) July 98-July 1999: Posdoctoral fellow, Department of Physics, Duisburg University, D-47048 Duisburg, Germany, financed by Graduiertenkolleg.

(b) July 97-June 98: Postdoctoral fellow, Institute for Theoretical Physics, University of Cologne, D-50923 Cologne, Germany, financed by Sonderforschungsbereich 341.

(c) July 96-April 97: Research Associate, Department of Physics, Indian Institute of Science, Bangalore-560012, India, funded by Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India.

8(A). Teaching positions held:

A. Krishnanagar Govt. College (1999-2006)
B. Presidency College (2006-2012)
C. Presidency University (2012-continuing)

8(B). Teaching experiences:

A. Advanced Computational Techniques, Advanced Techniques in Theoretical Physics, in Ph.D coursework.
B. Statistical Mechanics, Quantum Mechanics, Classical Electrodynamics, Advanced Condensed Matter Physics, Nonlinear dynamics, Numerical Analysis with programming (FORTRAN) in M.Sc. level.
C. Statistical Mechanics, Quantum mechanics, Thermodynamics, Electromagnetic theory, Optics, Numerical Analysis with programming (FORTRAN), Elementary experiments in B.Sc. level.

9(A). List of Publications (Peer reviewed):

www.scopus.com/authid/detail.uri?authorId=7003951569
https://publons.com/researcher/1446081/muktish-acharyya/
scholar.google.co.in/citations?user=BsX4IMYAAAAJ&hl=en

1. M. Acharyya, **Role of anisotropy to the compensation in the Blume-Capel trilayered ferrimagnet**, Superlattice and Microstructures (Elsevier) **147** (2020) 106648 (IF:2.120)
   https://doi.org/10.1016/j.spmi.2020.106648

2. M. Naskar and M. Acharyya, **Effects of random fields on the reversal of magnetisation of Ising ferromagnet**, Physica A (Elsevier) **551** (2020) 124583, (IF:2.924)
   https://doi.org/10.1016/j.physa.2020.124583

3. Sk. Sajid and M. Acharyya, **Compensation in site diluted spin-1/2 Ising ferrimagnet: A Monte Carlo study**, *Phase Transition* (Taylor and Francis) **93** (2020) 62-73, (IF:1.004)
   https://doi.org/10.1080/01411594.2019.1692016

4. A. Halder and M. Acharyya, **Universality Class of the Nonequilibrium Phase Transition in Two-Dimensional Ising Ferromagnet Driven by Propagating Magnetic Field Wave**, *Applied Mathematics*, **10** (2019) 568-577
   DOI:10.4236/am.2019.107040

5. S. Kayal and M. Acharyya, **Transient phases in the Vicsek model of flocking**, *Journal of Physics Through Computation*, **1** (2018) 17-30
   DOI:10.23977/jptc.2018.11003

6. R. Datta, M. Acharyya and A. Dhar, **Magnetisation reversal in Ising ferromagnet by thermal and field gradients**, *Heliyon (Elsevier)*, **4** (2018) e00892, DOI:10.1016/j.heliyon.2018.e00892.

7. M. Acharyya, **Driven spin wave modes in XY ferromagnet: Nonequilibrium Phase Transition**, *Phase Transitions* 91 (2018) 793

8. J. Chattopadhyay and M. Acharyya, **Statistics of projected motion in one dimension of a d dimensional random walker**, *Applied Mathematics*, **9** (2018) 602

9. A. Halder and M. Acharyya, **Nonequilibrium phase transitions in spin-S Ising ferromagnet driven by propagating and standing magnetic field wave**, *Communications in Theoretical Physics (IOP)*, **68** (2017) 600.

10. M. Acharyya, **Spin flip statistics and spin wave interference patterns in Ising ferromagnetic films: A Monte Carlo study**, *Heliyon (Elsevier)* **3** (2017) e00357, DOI:10.1016/j.heliyon.2017.e00357.

11. M. Acharyya and A. Halder, **Blume-Capel ferromagnet driven by propagating and standing magnetic field wave: Dynamical modes and nonequilibrium phase transition**, *J. Magn. Magn. Mater.*, **426** (2017) 53.

12. A. Dhar and M. Acharyya, **Reversal of magnetisation in Ising ferromagnet by the field having gradient**, *Commun. Theor. Phys. (IOP)*, **66** (2016) 563.

13. A. Banerjee and M. Acharyya, **Spatio-temporal dynamics of the Kuramoto-Sakaguchi model with time dependent connectivity**, *Phys. Rev. E*, **94** (2016) 022213

14. A. Halder and M. Acharyya, **Standing magnetic wave on Ising ferromagnet: Nonequilibrium phase transition**, *J. Magn. Magn. Mater.* 420 (2016) 290.

15. M. Acharyya, **Exit probability and first passage time of a lazy Pearson walker: Scaling behaviour**, *Applied Mathematics* **7** (2016) 1353.

16. M. Acharyya, **Model and statistical analysis of the motion of a tired random walker in continuum**, *Journal of Modern Physics* **6** (2015) 2021.

17. M. Acharyya, **Standing spin wave mode in RFIM: Patterns and athermal nonequilibrium phases**, *J. Magn. Magn. Mater.*, **394** (2015) 410.

18. M. Acharyya, **Ising metamagnet driven by propagating magnetic field wave: Nonequilibrium phases and transitions**, *J. Magn. Magn. Mater.*, **382** (2015) 206.

19. S. Ghosh, M. Acharyya, T. Majumder and A. Bagchi, **Metabolic signatures of oxidative stress and their relationship with erythrocyte membrane surface roughness among workers of manual materials handling (MMH)**, *North American Journal of Medical Sciences*, **77** (2015) 558

20. M. Acharyya, **Nucleation in Ising ferromagnet by a field spatially spreading in time**, *Physica A*, **403**, (2014) 94

21. M. Acharyya, **Dynamic Symmetry Breaking Breathing and Spreading Transitions in Ferromagnetic Film Irradiated by Spherical Electromagnetic Wave**, *J. Magn. Magn. Mater.*, **354**, (2014) 349

22. M. Acharyya, **Polarised electromagnetic wave propagation through the ferromagnet: Phase boundary of dynamic phase transition**, *Acta Physica Polonica B*, **45** (2014) 1027

23. M. Acharyya, **Random field Ising model swept by propagating magnetic field wave: Athermal nonequilibrium phase diagram**, *J. Magn. Magn. Mater.* **334** (2013) 11.

24. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising model: Absence of tricritical behaviour in presence of impurities**, *Acta Physica Polonica B*, **43** (2012) 2041.

25. A. B. Acharyya and M. Acharyya, **Bose - Einstein condensation in arbitrary dimensions**, *Acta Physica Polonica B*, **43** (2012) 1805

26. M. Acharyya, **Form invariant Sommerfeld electrical conductivity in generalised d - dimensions**, *Communications in Theoretical Physics*, **56** (2011) 943

27. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising model driven by propagating magnetic field wave**, *Physica Scripta*, **84** (2011) 035009

28. M. Acharyya, **Monte Carlo study of the dynamic phase transition in Ising metamagnet driven by oscillating magnetic field**, *Journal of Magnetism and Magnetic Materials*, **323** (2011) 2872

29. M. Acharyya, **Pauli spin paramagnetism and electronic specific heat in generalised d dimensions**, *Communications in Theoretical Physics*, **55** (2011) 901

30. M. Acharyya and A. B. Acharyya, **Evidence of invariance of time scale at critical point in the Ising meanfield equilibrium equation of state**, *Communications in Theoretical Physics*, **55** (2011) 1109

31. M. Acharyya, **Nonequilibrium Magnetisation reversal by periodic Impulsive fields in Ising meanfield dynamics**, *Physica Scripta*, **82** (2010) 065703

32. M. Acharyya, **Noninteracting fermions in infinite dimensions**, *European Journal of Physics*, **31** (2010) L89

33. M. Acharyya and A. B. Acharyya, **Critical Slowing down along the dynamic phase boundary in Ising meanfield dynamics**, *Int. J. Mod. Phys.* C, **21** (2010) 481

34. M. Acharyya and A. B. Acharyya, **Inflection point as a manifestation of tricritical point on the dynamic phase boundary in Ising meanfield dynamics**, *Communications in Computational Physics*, **3** (2008) 397

35. M. Acharyya, **Nonequilibrium multicritical behavior in anisotropic Heisenberg ferromagnet driven by oscillating magnetic field**, *Int. J. Mod. Phys.* C, **17** (2006) 1107

36. M. Acharyya, **Nonequilibrium Phase Transitions in model ferromagnets: A review**, *Int. J. Mod. Phys.* C, **16** (2005) 1631

37. M. Acharyya, **Multiple dynamic phase transitions in anisotropic Heisenberg ferromagnet driven by polarised magnetic field**, *Phys. Rev. E*, **69** (2004) 027105

38. M. Acharyya and A. B. Acharyya, **Modelling and computer simulation of an insurance policy: A search for maximum profit**, *Int. J. Mod. Phys.* C, 14 (2003) 1041

39. M. Acharyya, **Axial and off axial dynamic transitions in uniaxially anisotropic Heisenberg ferromagnet: A comparison**, *Int. J. Mod. Phys.* C, 14 (2003) 49

40. M. Acharyya, **Off-axial symmetry breaking in uniaxially anisotropic Heisenberg ferromagnet**, *Int. J. Mod. Phys.* C, 12 (2001) 709

41. M. Acharyya, A. Basu, R. Pandit & S. Ramaswamy, **Inequivalence of Dynamical Ensembles in a Generalised Driven Diffusive Lattice Gas**, *Phys. Rev. E*, 61 (2000) 1139

42. M. Acharyya, U. Nowak and K. D. Usadel, **Transverse ordering of an antiferromagnet in a field with oblique angle to the easy axis**, *Phys. Rev. B*, 61 (2000) 464

43. B. K. Chakrabarti and M. Acharyya, **Dynamic transitions and Hysteresis**, *Rev. Mod. Phys.*, **71**, (1999) 847

44. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising model: Existence of tricritical point and stochastic resonance**, *Phys. Rev. E*, **59** (1999) 218

45. M. Acharyya and D. Stauffer, **Effects of boundary conditions on the critical spanning probability**, *Int. J. Mod. Phys.* C, **9** (1998) 643

46. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising model: Is transition point the maximum lossy point ?**, *Phys. Rev. E*, **58** (1998) 179

47. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising Model: Dynamical symmetry breaking by randomly varying magnetic field**, *Phys. Rev. E*, **58** (1998) 174

48. M. Acharyya and D. Stauffer, **Nucleation and hysteresis in Ising model: Classical theory versus computer simulation**, *European Physical Journal B*, **5** (1998) 571; Erratum EPJB, **7** (1999) 169

49. M. Acharyya, **Comparisons of meanfield and Monte Carlo approaches to dynamic hysteresis in Ising ferromagnets**, *Physica A*, **253** (1998) 199

50. S. S. Mandal and M. Acharyya, **Specific heat in the integer quantum Hall effect: An exact diagonalization approach**, *Physica B*, **252** (1998) 91

51. M. Acharyya, **Zero temperature dynamic transition in the random field Ising model: A Monte Carlo study**, *Physica A*, **252** (1998) 151 do not have any conflict of interest

52. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising model: Critical slowing down and specific-heat singularity**, *Phys. Rev. E*, **56** (1997) 2407

53. M. Acharyya, **Nonequilibrium phase transition in the kinetic Ising model: Divergences of fluctuations and responses near the transition point**, *Phys. Rev. E*, **56** (1997) 1234

54. M. Acharyya, J. K. Bhattacharjee and B. K. Chakrabarti, **Dynamic Response of Ising System to a Pulsed field**, *Phys. Rev. E*, **55** (1997) 2392

55. M. Acharyya, **Nonequilibrium phase transition and 'specific-heat' singularity in the kinetic Ising model: A Monte Carlo study**, *Physica A*, **235** (1997) 469

56. M. Acharyya and B. K. Chakrabarti, **Response of random dielectric composites and earthquake models to pulses: Prediction possibilities** *Physica A*, **224** (1996) 254

57. M. Acharyya and B. K. Chakrabarti, **Growth of breakdown susceptibility in random composites and stick-slip model of earthquakes: Prediction of breakdown voltage and other catastrophes**, *Phys. Rev. E*, **53** (1996) 140; Erratum, *Phys. Rev. E*, **54** (1996) 2174

58. M. Acharyya and B. K. Chakrabarti, **Growth of breakdown susceptibility in random composites and in BTW model: Prediction of dielectric breakdown and other catastrophes**, *Ind. J. Phys. A* **69** (1995) 205

59. M. Acharyya and B. K. Chakrabarti, **Response of Ising systems to oscillating and pulsed fields: Hysteresis, ac and pulsed susceptibility**, *Phys. Rev. B*, **52** (1995) 6550

60. M. Acharyya and B. K. Chakrabarti, **Study of response to pulses and possible prediction of catastrophes**, *J. Phys. I (France)*, **5** (1995) 153

61. M. Acharyya and B. K. Chakrabarti, **Ising system in oscillating field: Hysteretic response**, in *Annual reviews of computational physics*, Ed. D. Stauffer, (World Scientific, Singapore), Vol. **1** (1994) 107

62. M. Acharyya and B. K. Chakrabarti, **AC susceptibility and hysteresis in Ising magnets**, *J. Mag. Mag. Mat.*, **136** (1994) L29

63. M. Acharyya, B. K. Chakrabarti and R. B. Stinchcombe, **Hysteresis in Ising model in transverse field**, *J. Phys. A: Math. Gen.*, **27**, (1994) 1533

64. M. Acharyya and B. K. Chakrabarti, **Magnetic hysteresis loops as Lissajous plots of relaxationally delayed response to periodic field variation**, *Physica A*, **202** (1994) 467

65. M. Acharyya, **Structural properties of planar random heap of hard discs**, *J. Phys. I (France)*, **3** (1993) 905 ; Erratum, *J. Phys. I (France)*, **3** (1993) 2123

66. M. Acharyya and B. K. Chakrabarti, **Monte Carlo study of hysteretic response and relaxation in Ising models**, *Physica A*, **192** (1993) 471

67. B. K. Chakrabarti and M. Acharyya, **Instabilities in a sandpile under vibration**, *J. Phys. I (France)*, **2** (1992) 389

9(B). Publications in Conference proceedings:

68. M. Acharyya, *Patterns, dynamics and phase transitions in Ising ferromagnet driven by magnetic field wave* in the **STATPHYS-VIII**, held at SNBNCBS, Kolkata, India, December 1-5, 2014. Invited lecture materials published in *Journal of Physics: Conference Series (IOP)* **638** (2015) 012008. (DOI:10.1088/1742-6596/638/1/012008)

69. M. Acharyya, U. Nowak and K. D. Usadel, *Phase diagram of a classical anisotropic Heisenberg antiferromagnet in a field*, in Conference proceeding, *Structure and Dynamics of Heterogeneous systems* Eds. P. Entel and D. E. Wolf, World-Scientific, (1999) pp 317.

70. M. Acharyya, P. Ray and B. K. Chakrabarti, *Cluster Statistics in Dielectric Breakdown*, *Physica A* (Elsevier), **224** (1996) 287

71. M. Acharyya, B. K. Chakrabarti and A. K. Sen, *Monte Carlo study of the hysteretic response of two dimensional Ising system: Scaling behaviour*, *Physica A* (Elsevier), **186** (1992) 231

72. S. Chandra and M. Acharyya, *A Monte Carlo Study on the Variation of Residual Magnetisation with the Ratio of Coupling Strengths and Non-magnetic Impurities in an Ising Trilayer*, AIP conference Proceedings **2220** (2020) 130037
https://doi.org/10.1063/5.0001865
http://arxiv.org/abs/1911.07261

10(A). Editorship of International Research Journals:

1. **Joint Editor-in-Chief**, *Journal of Physics Through Computation*, Clausius Scientific Press, Ottawa, Canada. A peer reviewed, Scopus indexed International Research Journal (**ISSN:2617-1163**).
www.clausiuspress.com/journal/JPTC/editorialBoard.html

10(B). Editorial Board Membership of International Journals:

1. Editorial Board member of the Journal *Heliyon* (**CellPress**),
www.cell.com/heliyon/physics/editors
2. Editorial Board member of *Frontiers in Physics*
(**ISSN:2296-424X**)
(**www.frontiersin.org/journals/physics/sections/interdisciplinary-physics**)

11. Reviewer of research projects/papers (names of the Journals):
Project proposals:

1. **Reviewed one Proposal of Project (National Science Foundation, USA) in 2000**
2. **Reviewed one Proposal of Project (US-Israel Binational Science Foundation) in 2015**

Journals:

1. Journal of Magnetism and Magnetic Materials (Elsevier)
2. Physics Letters A (Elsevier) (outstanding reviewer 2017)
3. Physica A (Elsevier) (outstanding reviewer 2017)
4. Physica B (Elsevier)
5. Thin Solid Films (Elsevier)
6. Modern Physics Letters B (World Scientific)
7. Phase Transitions (Taylor and Francis)
8. European Journal of Physics (IOP)
9. Chemical Physics letters (Elsevier) (outstanding reviewer 2016)
10. Journal of Theoretical Biology (Elsevier) (outstanding reviewer 2017)
11. Journal of Cluster science (Springer)
12. European Physical Journal B (Springer)

12. A partial list of citations of my work:

1. M. M. Bermudez et al, Phys. Rev. B **101** (2020) 060502(R)
2. T. Bar et al., Phys. Rev. Lett. **121** (2018) 045701
3. E. Vatansever and N. G. Fytas, Phys. Rev. E **97** (2018) 012122
4. P. Riego et. al. Phys. Rev. Lett. **118** (2017) 117202
5. Y. Yuksel, Physica B, **508** (2017) 62

6. S. Kumar et. al. Phys. Rev. E **93** (2016) 010402(R)
7. K. Binder and P. Virnau, J. Chem. Phys. **145** (2016) 211701
8. M. Lino et al, Phys. Rev. E. **92** (2015) 012916
9. Y. Yuksel, Phys. Rev. E, **91** (2015) 032149
10. X. Shi, J. Zhao, X. Xu, Physica A, **419** (2015) 234
11. K. Tauscher and M. Pleimling, Phys. Rev. E, **89** (2014) 022121
12. A. Berger, O. Idigorus, P. Vavassori, Phys. Rev. Lett. **111** (2013) 190602
13. H. Park and M. Pleimling, Phys. Rev. Lett. **109** (2012) 175703
14. S. W. Sides et al., Phys. Rev. Lett., **81** (1998) 834
15. E. Machado et al. Phys. Rev. E **71** (2005) 016120
16. M. Keskin et al. Phys. Rev. E **72** (2005) 036125
17. S. Zapperi et al., Phys. Rev. Lett., **78** (1997) 1408
18. J. S. Suen and J. L. Erskine, Phys. Rev. Lett., **78** (1997) 3567
19. Clement et al., Phys. Rev. Lett., **69** (1992) 1189
20. I. Junier and J. Kurchan, Europhys. Lett, **63** (2003) 674
21. Tomoaki Yasui et al, Phys. Rev. E, **66** (2002) 036123
22. Korniss et al, Phys. Rev. E **66** (2002) 056127
23. G. S. Jeon et. al, Phys. Rev. B., **65** (2002) 184510
24. H. Jang et al, Phys. Rev. B **67** (2003) 094411
25. H. Jang et al, Phys. Rev. E **68** (2003) 046115
26. Fujiwara et. al, Phys. Rev. E **70** (2004) 066132
27. Han Zhu et. al., Phy. Rev. B **70** (2004) 132403
28. Zhong Fan and Zhang Jinxiu, Phys. Rev. Lett., **75** (1995) 2027
29. S. W. Sides et al., Phys. Rev. E, **57** (1998) 6521
30. M. Luse and A. Zangwill, Phys. Rev. E, **50** (1994) 224
31. M. C. Mahato and S. R. Shenoy, Phys. Rev E, **50** (1994) 2503
32. B. Bonnier, Phys. Rev. E, **51** (1995) 779

33. Z. Neda, Phys. Rev. E, **51** (1995) 5315

34. Zhong Fan et al., Phys. Rev. E, **52** (1995) 1399

35. V. Banerjee et al., Phys. Rev. E, **52** (1995) 1436

36. Q. Jiang et al. , Phys. Rev. B, **52** (1995) 14911

37. Z. Neda, Phys. Lett. A, **210** (1996) 125

38. S. Sarkar and D. Bose, Phys. Rev. E., **55** (1997) 2013

39. D. Bose and S. Sarkar, Phys. Rev. E **56** (1997) 6581

40. P. A. Rikvold et. al, Phys. Rev. E, **59** (1999) 2710

41. G. P. Zheng and J. X. Zhang, Phys. Rev. E, **58** (1998) R1187

42. Vehnkamaki and Ford, Phys. Rev. E, **59** (1999) 6483

43. P. B. Thomas and D. Dhar, J. Phys. A, **26** (1993) 3973

44. B. Daviren et al, JMMM, **321** (2009) 1787

45. Z. Huang, F. Zhang, Z. Chen, Y. Du, Eur. Phys. J. B **44** (2005) 423

46. E. Faraggi, JMMM, **303** (2006) 49

47. M. Keskin et al., et al., JMMM, **313** (2007) L1

48. O. Canko et al, Physica A, **388** (2009) 24

49. M. C. Mahato and S. R. Shenoy, J. Stat. Phys, **73** (1993) 123

50. S. W. Sides et al., J. Appl. Phys., **79** (1996) 6482

13. Citations of my works in books:

1. *A Kinetic view in Statistical Physics*, P M Krapivsky, S Redner and E Ben-Naim, 2010, Cambridge University Press.

2. *Domains in ferroic crystals and thin films*, A K Tagantsev, L E Cross and J Fousek, 2010, Springer.

3. *Quantum Ising phases and transitions in transverse Ising models*, S Suzuki, J Inoue and B K Chakrabarti, 2012, Springer.

14. Invited/Contributed talks:

(1) Invited lecture: In a State level Webinar organised by Government General Degree College at Kalna-1, WB, on 6th September, 2020. Title: Can phase transition be visualized as bifurcation ?

(2) Invited lecture: In an International Webinar organised by the Department of Physics, Mahisadal Raj College, WB, on 12th August, 2020 Title: Ferromagnetic phase transition as supercritical pitchfork bifurcation.

(3) Invited lecture: In a state level Webinar organised by the Department of Physics, Nabadwip Vidyasagar College, West Bengal, on 25th June, 2020. Title: Why don't we think differently ? Elementary dynamics and Fermat's principle.

(4) Invited lecture: In DBT sponsored seminar, at Moulana Azad College, Kolkata, on 28th February, 2020. Title: Physics through computer simulatiion.

(5) Invited lecture: In DBT sponsored programme, at Moulana Azad College, Kolkata, on 28.02.2019. Title: Amazing features of nonlinear world.

(6) Contibuted talk: In Indian Statistical Physics Community Meeting (ISPCM2019) held at ICTS, Bangalore, February 14-16, 2019. Title of the talk was *Driven XY ferromagnet: Nonequilibrium behaviours.*

(7) Invited talk: In the National workshop "Expanding Horizon in Physics (EHP-2019)" held at Vidyasagar University, West Bengal, January 16-22, 2019. Title of the talk: *The story of driven ferromagnet.*

(8) Invited talk: In the "National Seminar on Current Trends in Computational Physics" (NSCTCP-2015), held at the Department of Physics, University of Gour Banga, Malda on 17th May, 2015. Title of the talk:*Nonequilibrium patterns and Phases in Driven Ising Ferromagnet.* www.ugb.ac.in/seminar-conference/

(9) Contributed talk: In a national conference, *Indian Statistical Physics Community meeting 2015*, held at Indian Institute of Science, Bangalore, in February 13-15, 2015. Title of the talk:*Nonequilibrium patterns and phases in RFIM at T=0.*
(www.icts.res.in/discussion-meeting/ISPC2015)

(10) Invited talk: In an international conference, STATPHYS-VIII, held at S N Bose Centre, Kolkata, in December, 1-5, 2014. Title: *Patterns, dynamics and phase transitions in Ising ferromagnet driven by magnetic field wave*
newweb.bose.res.in/Conferences/STATPHYSKOLKATAVIII

(11) Invited talk: At IACS, Kolkata on 17.09.2014. Title: *Patterns, Dynamics and phase transition in ferromagnetic film irradiated by EM wave*
iacs.res.in/seminars.html

(12) Invited talk: In a national conference, CMDAYS14 (27.08.2014-29.08.2014) held at CRNN, Calcutta University, Kolkata, with title *EM wave propagation through the ferromagnetic film: Nonequilibrium Phase Transition.*
(http://cmdays.iopb.res.in)

(13) Contributed talk: Department of Physics, Indian Institute of Science, Bangalore, on 2nd February, 2014, contributed as a speaker in the Indian Statistical Physics Community Meeting (2014). Title of the talk was *Breathing and Spreading transitions in Ising ferromagnet* (www.icts.res.in/discussion-meeting/ISPC2014)

(14) Invited talk: S N Bose National Centre for Basic Sciences, Kolkata, on 19th December, 2013, invited as a Colloquium speaker with title, *Dynamic symmetry breaking*

breathing and spreading transitions in ferromagnetic film irradiated by spherical electromagnetic wave.

(15) Invited talk: Department of Physics, Jadavpur University, *Ferromagnetic phase transition and Statistical Mechanics*, a set of two lectures delivered (on 14th and 15th December,2012), as an Invited Resource Person , in the Refresher course (3.12.2012-22.12.2012) organised by UGC Academic Staff college, Jadavpur University, Calcutta, India.

(16) Invited talk: Department of Physics, Jadavpur University, *Computer Simulation in Physics and Chemistry*, on 23rd July, 2012, as an Invited Resource Person, organised by UGC Academic Staff College, Jadavpur University in a Special Summer School "Principles and applications in basic sciences" (9.7.2012-28.7.2012).

(17) Invited talk: Department of Physics, Calcutta University, *Multiple dynamic phase transitions in uniaxially anisotropic Heisenberg ferromagnet driven by polarised magnetic field* on 19th August, 2010
(Ref:http://sites.google.com/site/statphyscu/muktish-acharyya).

(18) Invited talk, *Dynamic transition and Hysteresis*, RWTH-Aachen, Germany in Februray 1998.

(19) Invited talk, *Responses of Ising ferromagnet to time varying magnetic field*, Stuttgart University, Germany on 20.10.1997

(20) Invited talk, *Ising model in oscillating field: Hysteretic response*, IIT - Kanpur, in March 1997.

(21) *Dielectric breakdown and other Catastrophes: Prediction possibilities*, University of Poona, in February 1995 as a speaker of Theoretical Physics Seminar Circuit Programme.

(22) *Dynamical response of Ising system*, IISc Bangalore in January 1995, as a speaker of Theoretical Physics Seminar Circuit Programme.

15. Conference organised

1. Organised (Joint Secretary) the 10th International conference on Statistical Physics STATPHYS-KOLKATA-X, during November 26-29, 2019 at Presidency University, Kolkata.
https://sites.google.com/site/statphyskolkatax/

2. Organised (Joint convener) the International Webinar on Condensed Matter Physics, 22nd July, 2020, Department of Physics, Presidency University.
https://youtu.be/SlBxJaH-h4s

3. Organised (Joint Convener) the International Webinar on Nanomagnetism, 10th August, 2020, at Department of Physics, Presidency University.
https://youtu.be/ledZdlSmIOQ

4. Organised (Joint Convener) the International Webinar on Statistical Physics, 23rd August, 2020, Department of Physics, Presidency University.
https://youtu.be/f7iuc_K1YWo

5. Organised (Joint Convener) the International Webinar on Statistical Physics, 30th August, 2020, Department of Physics, Presidency University.
https://youtu.be/6qIV2DVpxIU

16. Brief description of research work:

I have worked on few problems of statistical and condensed-matter physics. A brief description of my research work is given below:

- I have carried out some studies of the dynamic hysteretic response and nonequilibrium phase transition in the kinetic Ising model in the presence of a time-dependent (sinusoidally oscillating) field [61, 59]. These studies have involved Monte Carlo simulations and the numerical solution of the dynamical differential (mean-field, etc.) equations of motion [34, 49]. The athermal dynamic transition [51] in the random-field Ising model (2D) was studied by Monte Carlo simulations. The frequency variation of coercive field was studied [49] by Monte Carlo simulation and by solving dynamical mean-field equation. These studies constitute the major part of my earlier research work; they have been summarised in a review [43] which is published in **Reviews of Modern Physics, 71, (1999) 847,** ; and they include the following:

  - I have studied the nonequilibrium phase transition in and the temperature variations of AC susceptibilities, the 'relaxation' time and the 'specific-heat' [55, 53, 52] of the kinetic Ising model in the presence of a sinusoidally varying magnetic field.
  - I have investigated the behaviour of dynamic correlation function [46] near this transition and found an exact relation between the dynamic correlation function, the dynamic order parameter, and the hysteretic loss.
  - I have recently confirmed the existence of a tricritical point [44] by studying the temperature variations of the distribution of order parameter and the fourth-order cumulant.
  - I have elucidated the connection between this dynamic phase transition and the stochastic resonance in this system.
  - I have also studied this dynamic transition via dynamical symmetry breaking [47] in a randomly driven Ising ferromagnet.
  - I have investigated the dynamical response of kinetic Ising model to a pulsed magnetic field [54] and have proposed *finite-time* scaling in this context.

- I have carried out studies of both static [65] and dynamic properties [67] of granular materials (heaps of hard discs and spheres).

- I have studied [57] earthquake models (like the Burridge-Knopoff model) numerically and shown that, in these models, the *prediction* of imminent earthquakes is possible by measuring the response to periodic pulses.

- I have studied the dielectric breakdown problem [57] by solving Laplace's equation numerically on a lattice and have found a possible way of *predicting* the breakdown voltage prior to macroscopic breakdown. I have also studied cluster statistics and growth phenomena here.

- I have studied [50] the temperature dependence of the specific heat of a model that shows the Integer Quantum Hall effect by the numerical *diagonalization* of a tight-binding Hamiltonian.

- I have studied metastability and nucleation phenomena [48] in Ising systems by Monte Carlo simulations that use the multi-spin coding technique and parallel processing (*Geometric parallelization* on a CRAY-T3E). The applicability of classical nucleation theory to the analysis of our simulation results of the low-frequency hysteretic loss is discussed.

- I have studied [45] the effects of different boundary conditions on the spanning probability at the percolation threshold for random site percolation.

- The response of classical vector spin model (ferromagnetic) to time varying (polarized) magnetic field is current interest of research [40, 39, 37, 36]. The nonequilibrium multicritical behavior was found [35] in anisotropic Heisenberg ferromagnet driven by polarized magnetic field. A review [36] has been written collecting very recent works on the dynamic transitions in vector spin models.

- Studying the dynamical responses of model ferromagnets to the spatio-temporal variations of fields
  (For video, http://youtu.be/41TZPM-uxuc
  and http://youtu.be/S_rGUQNjcig).

- Studying the electronic properties[32, 29, 26] of solids in generalised d-dimensions.

- Studying the dynamical responses of metamagnets[28, 18] to the time varying magnetic field.

- Studying the dynamical responses of driven [17] random field Ising model.
  (For a sample video see, http://youtu.be/5pzW3chzYnw)

17. Present research interest:

1. Metastability in model ferromagnets.
2. Interference of spin waves.
3. Behaviours of driven systems.
4. Random walk.
5. Nonlinear dynamics.
6. Behaviours of active matter.
7. Compensation transition in magnetic models.

18. My collaborators:

Bikas Chakrabarti (SINP, Calcutta), Rahul Pandit (IISC, Bangalore), Sriram Ramaswamy (IISC, Bangalore), Sudhangsu Mandal (IIT, Kharagpur), Jayanta Bhattacharjee (IACS, Kolkata), Dietrich Stauffer (Cologne University, Germany), Robin Stinchcombe (Oxford University, UK), Ulrich Nowak (Konstanz University, Germany), Klaus Usadel (Duisburg University, Germany), Ajanta Bhowal Acharyya (Lady Brabourne College, Calcutta), Abhik Basu (SINP, Calcutta), Ashok Sen (SINP, Calcutta), Purushottam Ray

(IMSC, Chennai), Amitava Banerjee (Presidency University), Ajay Halder (Presidency University, Kolkata), Abyaya Dhar (IIT, Kharagpur), Jayeeta Chattopadhyay (IISc, Bangalore), Ranajay Dutta (Hyderabad University), Sayantani Kayal (TCIS, Hyderabad), Soham Chandra (PU), Sk. Sajid (PU), Moumita Naskar (PU).

19. Ph.D Supervision :

1. Ajay Halder–Awarded (provisional certificate received) in January, 2020
   Title:*Nonequilibrium Phase transition in ferromagnetic model systems*
2. Moumita Naskar (Ongoing, Joined with PhD registration in 2019)
3. Soham Chandra (Ongoing, Joined with PhD registration in 2019)

20. Projects supervised:

(A) B.Sc. Projects (6 credits):

1. Sourjya Bhattacharjee (2020): *Random matrices and the distribution of arrival times in New York city subway system*
2. Kuntal Pramanik (2018): *Bak-Tang-Weisenfeld model with probabilistic directional flow.*
3. Suman Pramanick (2018): *Onset of avalanches in BTW model of self organised criticality*
4. Sk. Sajid (2018): *Compensation transition and thermodynamics of S-1/2 Ising trilayer system. Results published in Phase Transition 93 (2020) 62*
5. Ranajay Dutta (2017): *Magnetisation reversal in presence of thermal gradient only and the simultaneous presence of thermal and field gradient. Results published in Heliyon 4 (2018) e00892*
6. Shreya Kumbhakar (2017): *Can we expect mobility edge in one dimensional systems for incommensurate potential ?*
7. Pronobesh Maity (2017): *Role of dimensionality in Classical and Quantum many body systems.*
8. Samudra Sur (2017): *Creation of new level-differences in quantum systems using random perturbations.*
9. Amitava Banerjee (2016): *Collective dynamics of coupled nonlinear oscillators, Published in Phys. Rev. E. 94 (2016) 022213*

(B) M.Sc. Projects (20 credits):

1. Arindam Das (2020): *Bacterial motion and Langevin equation*

2. Aritra Krishna De (2019): *Effects of nonmagnetic impurities on the reversal of ferromagnets*

3. Sayantani Kayal (2018): *Studies on the transient phases in the Vicsek model of flocking*. Published in *Journal of Physics Through Computation,* **1** *(2018) 17.* DOI:10.23977/jptc.2018.11003

4. Maneesha Ghosh (2017): *Theoretical analysis of ferromagnetic hysteresis*

5. Abyaya Dhar (2016): *Nucleation in Ising ferromagnet by a field having gradient.* Published in *Communications in Theoretical Physics (IOP)* **66** *2016 563*

6. Jayeeta Chatterjee (2016): *Tired walk and projected diffusion from higher dimensional random walk.* Published in Applied Mathematics **9** (2018) 602.

7. Santanu Dey (2015):*Statistics of droplet size in nucleating Ising ferromagnet*

8. Sukanta Chowdhury (2015):*Monte Carlo study on the effects of speed breaker and traffic signal in Nagel-Schrekenberg model of freeway traffic*

9. Rajit Thakur (2014): *Olami-Feder-Christensen automata model of earthquake for dissipative inhomogeneous system*

10. Tanmoy Biswas (2014): *The Olami-Feder-Christensen automaton model of earthquake for dissipative and homogeneous system*

11. Suraka Bhattacharyya (2014): *Classical nucleation in Ising ferromagnet in the coalescence regime*

12. Poulami Roy (2014): *Study of classical nucleation in single droplet regime*

13. Arijit Das (2013): *Dynamic phase transition of an Ising ferromagnet: A mean field approach*

14. Nepal Banerjee (2013): *Ferromagnetic phase transition in Ising model studied by Monte-Carlo simulation*

21. Administrative responsibilities:

1. Head of the Department (Since 1st July, 2019)
2. Member of CAS (Career Advancement Scheme) subcommittee of Presidency University.
3. External member: Board of Moderation, Board of studies, Doctoral committee, JRF selection committee
4.Member of panel of Judges: National Essay Competition (NEC-2018) held at SNBNCBS, September, 2018
5. Member of panel of Judges: Bose-Fest 2019, held at SNBNCBS, March, 2019