CURRICULUM VITAE and Complete Publication List: Subhashish Banerjee

FNASc
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Education:

1. Ph.D (August 2003), School of Physical Sciences, J.N.U., New Delhi, India. Thesis title: *Study of Dynamics of Open Quantum Systems using the Functional Integral Approach*
2. Bachelor of Engineering (B.E.) 1996, Delhi College of Engineering, Delhi University, India

Research Experience:

1. Associate Professor, Indian Institute of Technology Rajasthan, Jodhpur, India (27/03/2019 to present)
2. Assistant Professor, Indian Institute of Technology Rajasthan, Jodhpur, India (12/07/2010 to 26/03/2019)
3. Assistant Professor, Chennai Mathematical Institute, Chennai, India (September 2008 to June 2010)
4. Postdoctoral Fellow, Theoretical Physics Group, Raman Research Institute, Bangalore, India (August 2005 to August 2008)
5. Postdoctoral Fellow, Centre for High Energy Physics (CHEP), Indian Institute of Science (IISc), Bangalore, India (June 2005 to July 2005)
6. Postdoctoral Fellow, Fachbereich Physik,University of Kaiserslautern, Germany (January 2004 to April 2005)

Research Interest:

Quantum statistical mechanics and in particular, the study of **quantum theory of open systems**. In particular, the major theme of my work is to show how **The theory of Open Quantum Systems** provides a common umbrella to understand quantum optics, quantum information processing, quantum computing, quantum cryptography, relativistic quantum mechanics, particle physics and the foundations of quantum mechanics. I have also studied mathematical physics aspects of canonical transformations in Fock space. Over the last few years I have been developing a graphical representation of quantum mechanics. I am also interested in the physics of quantum thermodynamics and non-linear dynamics. In recent times, I have been working towards reaching a coherent understanding of non-Markovian phenomena. Ideas from non-Markovian physics find a rich breeding ground for investigations into quantum thermodynamics and also find a number of practical applications. I try to make a theoretical modelling keeping into consideration experiments. Thus, for e.g., in a number of my works related to the application of open system ideas to quantum information and quantum optics, I have made use of the experimental results of Wineland and Haroche. I have become interested recently in Flavor Physics that explores the deviations of predictions from the Standard Model. I am also deeply interested in probing the foundations of physics at the subatomic level.

Teaching Experience:

1. Course instructor at Indian Institute of Technology Jodhpur (IITJ)

   Undergraduate Courses:

   (a) Physics-I (Ist Semester): Electromagnetism;

   (b) Physics-II (IInd Semester): Amalgamation of statistical mechanics and solid state physics;

   (c) Undergraduate Physics Laboratory (Ist Semester): Undergraduate physics laboratory in the first semester having experiments related to mechanics, electromagnetism, optics;

(d) Physics-III (IIIrd Semester): Newtonian Mechanics, Special Theory of Relativity and introduction to Non Linear Dynamics;

(e) Quantum Mechanics and Its Applications: introducing quantum mechanics to undergraduate students. Basic experiments, concepts and a brief glimpse of some of its modern applications such as quantum optics and information, nuclear and particle physics.

(f) Undergraduate Physics Laboratory (IIIrd Semester): Undergraduate physics laboratory in the third semester dealing with experiments related to the Nature and Properties of Materials;

(g) Quantum Mechanics Laboratory (IVth Semester, Undergraduate B.E. and Postgraduates): Basic ideas of quantum mechanics illustrated via the Franck Hertz experiment, e/m ratio, $B-H$ curve, photoelectric effect, band gap of semiconductors and optics experiments such as diffraction grating.

(h) Basic Physics: an elementary introduction to modern aspects of physics such as quantum mechanics, atomic and nuclear physics, special relativity, lasers and superconductivity to BSc (Bachelor of Science) students at NLU (National Law University) Jodhpur, India.

(i) Foundations of Quantum Information (IIIrd Semester, Undergraduate B.E.): basic facets of quantum computation and information is introduced in detail. The hope is to develop an awarness among young students and ultimately to the development of trained manpower in this field.

Postgraduate Courses:

(a) Introduction to Quantum Computation and Information: elective course for final year undergraduate and Ph.D. students;

(b) Introduction to System Science and Dynamics: course on Systems Science for M.Tech. and Ph.D. students;

(c) Introduction to Cryptography and Coding: Introduction is provided to the basic concepts of cryptography and coding, classical as well as quantum. This is a course for Graduate Students as well as interested final year undergraduate students;

(d) Information Theory and Probability: for Postgraduate students;

(e) Relativistic Quantum Mechanics: deals with quantum mechanics in the relativistic regime, for graduate students;

(f) Quantum Field Theory: an introductory course on quantum field theory for graduate students;

(g) Critical Phenomena and Renormalization Group: Basic concepts of scaling and renormalization group in critical phenomena for MSc and PhD students;

(h) Non-perturbative Aspects of Quantum Field Theory: global solutions of nonlinear filed theories and their properties. Basics of solitons and instantons;

(i) Quantum Mechanics: an introduction of quantum mechanics to MSc (Masters in Science) students;

(j) Statistical Mechanics: basic thermodynamics and statistical mechanics for MSc students;

(k) Atomic and Nuclear Physics: introduction to atomic and nuclear physics for MSc students;

(l) Electrodynamics: Basic electrodynamics, with an introduction to relativistic effects and optics, for masters students (MSc Physics);

(m) Classical Mechanics: Basic classical mechanics for for masters students (MSc Physics);

(n) Open Quantum Systems: The subject is introduced with its various facets (PhD).

2. Course instructor at Chennai Mathematical Institute for: Newtonian Mechanics ; Statistical Mechanics-I: Thermodynamics ; Statistical Mechanics-II: classical statistical mechanics ; Statistical Mechanics-III: Ising model, phase transition, elements of non-equilibrium statistical mechanics.

3. Teaching assistant for courses in quantum mechanics and statistical mechanics in Fachbereich Physik, Kaiserslautern.

4. Teaching assistant for courses in electromagnetic theory, quantum mechanics and quantum field theory in J.N.U., New Delhi.

Outreach:

1. Was an active participant in: (a) Workshop on Systems Science - Complex Networks and Applications, May 07-09, 2012;

(b) International Workshop on Quantum Biology, January 25-27, 2013;

(c) International Workshop on Computational Materials Design and Engineering, February 8-10, 2013; held at Indian Institute of Technology Jodhpur.

2. Convener of *International Meet on Quantum Correlations and Logic, Language and Set Theory 2013*, at Indian Institute of Technology Jodhpur from December 9 to 14, 2013.

3. Course Coordinator of *GIAN programme 171009M01 Topological Solitons and their Applications*, from December 10-15, 2018 at IIT Jodhpur. External faculty was Prof. Richard MacKenzie of University of Montreal, Canada.

4. Coordinator of Faculty Development Proghram (FDP) on *Quantum Science and Technology* from August 19 to 30, 2019, at IIT Jodhpur.

5. Coordinator and Convenor of *Conference on Quantum Information and Computation: QIC-2019, at Indian Institute of Technology Jodhpur from December 8 to 11, 2019.*

6. Invited speaker to eighteen international conferences on Quantum Information.

7. Invited speaker to the 8th Nalanda Dialog on Science and Philosophy held at Nava Nalanda Mahavihara, Nalanda, Bihar, India from January 21-24, 2013.

8. Keynote speaker at the "One-Day Workshop on Quantum Communications" at Malviya National Institute of Technology (MNIT) Jaipur in September 2016.

9. Invited speaker to a number of international venues such as University of Freiburg (Germany), Technical University of Vienna (Austria), University of Troyes (France), University of Turku (Finland).

10. Invited speaker to Colloquiums at IIT Kanpur and IISc Bangalore.

11. As the first Head of the Physics Department at IIT Jodhpur, helped to develop the MSc Physics program introduced in July 2015. This involved, among other things, development of the courses and getting them approved from an external committee of senior Physicsts from the various IITs and TIFR (Mumbai).

12. Guest Editor of special volume *Quantum Aspects of the Universe* of the Journal *Universe*.

Administrative Experience:

1. First Head of the Department of Physics, IIT Jodhpur, from March 2015 to July 2018.

2. First Coordinator of the Interdisciplinary Program (IDRP) on Quantum Information and Computation (QIC) at IIT Jodhpur, from April 2019 to present.

Awards:

1. Awarded the "Science Foundation Ireland Short Term Travel Fellowship" from May 1 2012 to July 31 2012, by the Irish Physical Society.

2. OeAD scholar for the period 2017-18, in collaboration with University of Vienna.

3. First recipient of the research excellence award of IIT Jodhpur on the occasion of the Institute Foundation Day on 02/08/2020.

4. Elected Fellow of the The National Academy of Sciences, India (2020) (FNASc).

Projects:

(a). Co-Principal Investigator in the CSIR funded project on " Hunting of new physics through $b \to s$ transitions". Project completed;

(b). Principal Investigator in the CSIR funded project on " Graph Theoretical Aspects in Quantum Information Processing". Project completed;

(c). Principal Investigator in the CSIR funded project on "A Study of Quantum Correlations: Squeezing and its various facets". Project completed;

(d). Principal Investigator, from the Indian side, in the "DST India-BMWfW Austria Project Based Personnel Exchange Programme for 2017-2018", titled "Probing the Foundations of Quantum Mechanics in Neutrino Oscillations". Project completed;

(e). Co-Principal Investigator in the QuEST (Quantum Enabled Science and Technology) project: Interdisciplinary Cyber Physical Systems (ICPS)programme of DST Grant No.:DST/ICPS/QuST/Theme-1/2019/13 "Quantum heat engines". Project ongoing;

(f). Co-Principal Investigator in the QuEST (Quantum Enabled Science and Technology) project: Interdisciplinary Cyber Physical Systems (ICPS) programme of DST Grant No.:DST/ICPS/QuST/Theme-

1/2019/6 “Generation of entangled photons and its applications to Quantum Computation and Information Processing”. Project ongoing.

Students:

A. **Undergraduate**:

1. Guided B. Tech. Project of Jothishwaran C. Arunagiri, IIT Jodhpur, titled “Towards a better understanding of the Josephson Qubits” (2013);
2. Guided B. Tech. Project of Amar Singh Saini, IIT Jodhpur, titled “Quantum Cryptography (Quantum Repeater Technology)” (2014);
3. Guided Summer Internship Project of Ravi and Pradeep Saran, IISER Bhopal, titled “Quantum Computing and Information” (2014).
4. Guided Summer Internship Project of Rakesh Saini, IIT ISM DHANBAD, on Qunatum Field Theory (2019).
5. Guided Summer Internship Project of Smit Chaudhary, IIT Kanpur, on Quantum Optics (2019).

B. **Postgraduate**:

1. Guided the Masters (M.Tech.) Thesis of Shantanav Chakraborty, IIT Jodhpur, titled “Entanglement in the Quantum Search Algorithm”.
2. Guided the MSc Thesis of Nidhin Sathyan, IIT Jodhpur, titled “Studies on Quantum Entanglement”.
3. Guided the MSc Thesis of Vikrant Chaudhary, IIT Jodhpur, titled “Photon Localization”.
4. Guided the M.Tech training project for 8 th Semester of Komal Varshney, a student of B.Tech - M.Tech 4 th year at Centre for Converging Technologies, University of Rajasthan (UOR), Jaipur titled “Quantum Cryptography”.
5. Guided the MSc Thesis of Ekta Panwar, IIT Jodhpur, titled “Quantum speed limits in physical processes”.
6. Guided the MSc Thesis of Abhishek Roy, IIT Jodhpur, titled “Black Hole Information Paradox”.
7. Guided the MSc Thesis of Sachin Kumar, IIT Jodhpur, titled “Study of Quantum Phase Transitions (Phases of quantum matter at low temperature)”.
8. Guided the MSc Thesis of Mahima Yadav, IIT Jodhpur, titled “Measure of steerability of two qubit EPR Steering state”.

C. **Ph.D**:

1. Vibha Sahlot: Thesis successfully defended on January 08, 2019. Thesis title “Conflicts in Geometry”.
2. Supriyo Dutta: Thesis successfully defended on January 11, 2019. Thesis title “Graph Theoretic Aspects of Quantum Information Processing”.
3. Vishal Sharma: Thesis successfully defended on May 28, 2019. Thesis title “Quantum communication under noisy environment: from Theory to Applications”.
4. Javid Ahmad Naikoo: Thesis successfully defended on July 06, 2020. Thesis title “A study of nonclassicality in (Open) Quantum Systems”.

Additional:

(a). Invited reviewer for Mathematical Reviews (MR);
(b). Reviewer for J. of Stat. Phys;
(c). Reviewer for J. Phys. A;
(d). Reviewer for J. Phys. B;
(e). Reviewer for Physica A;
(f). Reviewer for QIC and QIP;
(g). Reviewer for Pramana;
(h). Reviewer for Phys. Rev. A;
(i). Reviewer for Phys. Rev. D;
(j). Reviewer for Phys. Rev. E;
(k). Reviewer of six Ph.D theses.

Publications:
Complete Publication List

Publications: **Journal Publications**

1. "Quantum theory of a Stern-Gerlach system in contact with a lineraly dissipative environment", Physical Review A **62**, 042105 (2000): S. Banerjee and R. Ghosh.

2. "Propagator for a spin-Bose system with the Bose field coupled to a reservoir of harmonic oscillators", J. Phys. A: Math. Gen **36**, 5787 (2003): S. Banerjee and R. Ghosh.

3. "General quantum Brownian motion with initially correlated and nonlinearly coupled environment", Physical Review E. **67**, 056120 (2003): S. Banerjee and R. Ghosh.

4. "Decoherence and dissipation of an open quantum system with a squeezed and frequency modulated heat bath", Physica A **337**, 67 (2004): S. Banerjee.

5. "Ultracoherence and Canonical Transformations", Infinite Dimensional Analysis, Quantum Probability and Related Topics **9**, 413 (2006): J. Kupsch and S. Banerjee.

6. "Applications of Canonical Transformations", J. Phys. A: Math. Gen **38**, 5237 (2005): S. Banerjee and J. Kupsch.

7. "Functional integral treatment of some quantum nondemolition systems and their variants", J. Phys. A: Math. Theo. **40**, 1273 (2007): S. Banerjee and R. Ghosh.

8. "Dynamics of decoherence without dissipation in a squeezed thermal bath", J. Phys. A:Math. Theo **40**, 13735 (2007): S. Banerjee and R. Ghosh.

9. "Classical limit of master equation for harmonic oscillator coupled to oscillator bath with separable initial conditions", Physical Review E **73**, 067104 (2006): S. Banerjee and A. Dhar.

10. "Phase diffusion pattern in quantum nondemolition systems", Phys. Rev. A **75**, 062106 (2007): S. Banerjee, J. Ghosh and R. Ghosh.

11. "Geometric Phase of a qubit interacting with a squeezed-thermal bath", Eur. Phys. J. D **46**, 335 (2008): S. Banerjee and R. Srikanth.

12. "An environment-mediated quantum deleter", Phys. Lett. A **367**, 295 (2007): R. Srikanth and S. Banerjee.

13. " Phase diffusion in quantum dissipative systems", Phys. Rev. A **76**, 062109 (2007): S. Banerjee and R. Srikanth.

14. " Complementarity in atomic systems: an information-theoretic approach", Eur. Phys. J. D **53**, 217 (2009): R. Srikanth and S. Banerjee.

15. "Complementarity in generic open quantum systems", Modern Phys. Lett. B **24**, 2485 (2010): S. Banerjee and R. Srikanth.

16. "Complementarity in atomic and oscillator systems", Phys. Lett. A **374**, 3147 (2010): R. Srikanth and S. Banerjee.

17. " Symmetries and noise in quantum walk", Phys. Rev. A **76**, 022316 (2007): C. M. Chandrashekar, R. Srikanth and S. Banerjee.

18. "Symmetry-noise interplay in quantum walk on n-cycle", Phys. Rev. A **78**, 052316 (2008): S. Banerjee, R. Srikanth, C. M. Chandrashekar and Pranaw Rungta.

19. " The squeezed generalized amplitude damping channel", Phys. Rev. A **77**, 012318 (2008): R. Srikanth and S. Banerjee.

20. "Entanglement dynamics in two-qubit open quantum system interacting with a squeezed thermal bath via quantum nondemolition interaction", Euro. Phys. J. D **56**, 277 (2010): S. Banerjee, V. Ravishankar and R. Srikanth.

21. " Dynamics of entanglement in two-qubit open quantum system interacting with a squeezed thermal bath via dissipative interaction", Ann. of Phys. (NY). **325**, 816 (2010): S. Banerjee, V. Ravishankar, R. Srikanth.

22. "Relationship Between Quantum Walk and Relativistic Quantum Mechanics", Phys. Rev. A **81**, 062340 (2010): C. M. Chandrashekar, S. Banerjee and R. Srikanth.

23. "A q-deformed logistic map and its implications", J. Phys. A.: Math. Theor. **44**, 045104 (2011): S. Banerjee and R. Parthasarathy.

24. "A study of Quantum Correlations in Open Quantum Systems", Quantum Information and Computation (QIC) **11**, 0541 (2011): I. Chakrabarty, S. Banerjee and N. Siddharth.

25. "Quantumness in decoherent quantum walk using measurement-induced disturbance", Phys. Rev. A **81**, 062123 (2010): R. Srikanth, S. Banerjee and C. M. Chandrashekar.

26. "Entanglement generation in spatially separated systems using quantum walk", Journal of Quantum Information Science: **2**, 15 (2012). C. M. Chandrashekar, S. K. Goyal and S. Banerjee.

27. "Parrondo's game using a discrete-time quantum walk", Phys. Lett. A **375**, 1553 (2011): C. M. Chandrashekar and S. Banerjee.

28. "Quantumness of noisy quantum walks: a comparison between measurement-induced disturbance and quantum discord", Phys. Rev. A **83**, 064302 (2011): B. R. Rao, R. Srikanth, C. M. Chandrashekar and S. Banerjee.

29. "Effect of control procedures on the evolution of entanglement in open quantum systems", Phys. Rev. A: **85**, 012327 (2012): S. Goyal, S. Banerjee and S. Ghosh.

30. "Geometric Phase: An Indicator of Entanglement", Euro. Phys. J. D: **66**, 168 (2012): S. N. Sandhya and S. Banerjee.

31. "The quantum cryptographic switch", Quantum Information Processing, Special Issue on Quantum Cryptography **13**, 59 (2014): S. Narayanaswamy, O. Srikrishna, R. Srikanth, S. Banerjee and A. Pathak.

32. "q–deformed logistic map with delay feedback", Commun. Nonlinear Sci. Numer. Simulat (CNSNS) **18**, 3126 (2013): M. D. Shrimali and S. Banerjee.

33. "Laplacian matrices of weighted digraphs represented as quantum states", Quantum Information Processing 16, 1-22 (2017) : Eprint:arXiv:1205.2747: Bibhas Adhikari, Subhashish Banerjee, Satyabrata Adhikari and Atul Kumar.

34. "Investigating nonclassical correlations of radiation emitted from generalized three-level atomic systems", Ann. of Phys. **331**, 97 (2013): H. S. Dhar, S. Banerjee, A. Chatterjee and R. Ghosh.

35. "Dissipative and Non-dissipative Single-Qubit Channels: Dynamics and Geometry", Quantum Information Processing **12**, 3725 (2013): S. Omkar, R. Srikanth and S. Banerjee.

36. "An Operational Meaning of Discord in terms of Teleportation Fidelity", Phys. Rev. A **86**, 062313 (2012): S. Adhikari and S. Banerjee.

37. "Quantification of Entanglement of Teleportation in Arbitrary Dimensions", Quantum Information Processing **13**, 863 (2014): Sk. Sazim, S. Adhikari, S. Banerjee and T. Pramanik.

38. "Enhancement of Geometric Phase by Frustration of Decoherence: A Parrondo like Effect", Phys. Rev. A **87**, 042119 (2013): S. Banerjee, C. M. Chandrashekar and A. K. Pati.

39. "The operator sum-difference representation for quantum maps: application to the two-qubit amplitude damping channel", Quantum Information Processing **14**, 2255 (2015), doi:10.1007/s11128-015-0965-5, arXiv:1212.2780: S. Omkar, R. Srikanth and S. Banerjee.

40. "Decoherence free Bd and Bs meson systems", Phys. Rev. D **88**, 013 (2013); arXiv:1304.4063: A. K. Alok and S. Banerjee.

41. "Characterization of quantum dynamics using quantum error correction", Eprint:arXiv:1405.0964: Phys. Rev. A **91**, 012324 (2015): S. Omkar, R. Srikanth and S. Banerjee.

42. "The Unruh effect interpreted as a quantum noise channel", Quantum Information and Computation (QIC) **16**, 0757 (2016); Eprint:arXiv:1408.1477: S. Omkar, S. Banerjee, R. Srikanth and A. K. Alok.

43. "Constraining quark mixing matrix in isosinglet vector-like down quark model from a fit to flavor-physics data", Nucl. Phys. B **906**, 321 (2016); Eprint:arXiv:1402.1023: A. K. Alok, S. Banerjee, D. Kumar and S. U. Sankar.

44. "Controlled bidirectional remote state preparation in noisy environment: A generalized view", Quantum Information Processing **14**, 3441 (2015), doi:10.1007/s11128-015-1038-5: Eprint:arXiv:1492.0833: V. Sharma, C. Shukla, S. Banerjee and A. Pathak.

45. "Quantum correlations in B and K meson systems", Eur. Phys. J. Plus **131**, 129 (2016); Eprint:arXiv:1409.1034: S. Banerjee, A. K. Alok and R. MacKenzie.

46. "Quantum correlations in terms of neutrino oscillation probabilities", Nucl. Phys. B **909**, 65 (2016); Eprint:arXiv:1411.5536: A. K. Alok, S. Banerjee and S. U. Sankar.

47. "Quantum code for quantum error characterization", Phys. Rev. A **91**, 052309 (2015): S. Omkar, R. Srikanth and S. Banerjee.

48. "A graph theoretical approach to states and unitary operations", Quantum Information Processing **15**, 2193 (2016); Eprint:arXiv:1502.07821: Supriyo Dutta, Bibhas Adhikari, Subhashish Banerjee.

49. "New-physics signals of a model with a vector-singlet up-type quark", Phys. Rev. D **92**, 013002 (2015): Ashutosh Kumar Alok, Subhashish Banerjee, Dinesh Kumar, S. Uma Sankar and David London.

50. "Quasiprobability distributions in open quantum systems: spin-qubit systems", Ann. of Phys. **362**, 261286 (2015), Kishore Thapliyal, Subhashish Banerjee, Anirban Pathak, S. Omkar, V. Ravishankar.

51. "Re-examining sin(2beta) and Delta m(d) from evolution of B(d) mesons with decoherence", Phys. Lett. B **749**, 94 (2015): Ashutosh Kumar Alok, Subhashish Banerjee, S. Uma Sankar.

52. "Tomograms for open quantum systems: in(finite) dimensional optical and spin systems": Ann. of Phys. **366**, 148 (2016); arXiv:1507.02135: Kishore Thapliyal, Subhashish Banerjee, Anirban Pathak.

53. "A quantum information theoretic analysis of three flavor neutrino oscillations": Eur. Phys. J. C (EPJC) **75**, 487 (2015); arXiv:1508.03480: Subhashish Banerjee, Ashutosh Kumar Alok, R. Srikanth and Beatrix C. Hiesmayr.

54. "Quantum Fisher and Skew information for Unruh accelerated Dirac qubit": Eur. Phys. J. C (EPJC) **6**, 437 (2016); arXiv:1511.03029: Subhashish Banerjee, Ashutosh Kumar Alok and S. Omkar.

55. "The two-qubit amplitude damping channel: characterization using quantum stabilizer codes": Ann. of Phys. **373**, 145 (2016); arXiv:1511.03368: S. Omkar, R. Srikanth, Subhashish Banerjee and Anil Shaji.

56. "Evolution of coherence and non-classicality under global environmental interaction ": Quantum Information Processing **17**, 236 (2018), arXiv:1601.04742: Samyadeb Bhattacharya, Subhashish Banerjee and Arun Kumar Pati.

57. "Bipartite separability and non-local quantum operations on graphs ": Phys. Rev. A **94**, 012306 (2016); arXiv:1601.07704: Supriyo Dutta, Bibhas Adhikari, Subhashish Banerjee and R. Srikanth.

58. "A comparative study of protocols for secure quantum communication under noisy environment: single-qubit-based protocols versus entangled-state-based protocols": Quantum Information Processing **15**, 4681 (2016), DOI: 10.1007/s11128-0016-1396-7; arXiv:1603.00178: Vishal Sharma, Kishore Thapliyal, Anirban Pathak and Subhashish Banerjee.

59. "Characterization of Unruh Channel in the context of Open Quantum Systems": Journal of High Energy Physics (JHEP) **02**, 82 (2017), DOI: 10.1007/JHEP02(2017); arXiv:1603.05450: Subhashish Banerjee, Ashutosh Kumar Alok, S. Omkar and R. Srikanth.

60. "Quantum cryptography over non-Markovian channels": Quantum Information Processing **16**, 115 (2017), DOI: 10.1007/s11128-017-1567-1; arXiv:1608.06071: Kishore Thapliyal, Anirban Pathak and Subhashish Banerjee.

61. "Quantum discord of states arising from graphs": Quantum Information Processing, **16**(8), 183 (2017), arXiv:1702.06360: Supriyo Dutta, Bibhas Adhikari and Subhashish Banerjee.

62. "Geometric phase and neutrino mass hierarchy problem": J. Phys. G, **45**, 085002 (2018), arXiv:1703.09894: Khushboo Dixit, Ashutosh Kumar Alok, Subhashish Banerjee, Dinesh Kumar.

63. "Condition for zero and non-zero discord in graph Laplacian quantum states": International Journal of Quantum Information (IJQI) **17**, 1950018 (2019), Supriyo Dutta, Bibhas Adhikari, Subhashish Banerjee.

64. "Non-Markovian evolution: a quantum walk perspective" arXiv:1711.03267: Open Systems and Information Dynamics (OSID) **25**, 1850014 (2018); Pradeep Kumar, Subhashish Banerjee, R. Srikanth, Vinayak Jagadish, Francesco Petruccione.

65. "Analysis of atmospheric effects on satellite based quantum communication: A comparative study": Quantum Information Processing **18**, 67 (2019); https://doi.org/10.1007/s11128-019-2182-0: arXiv:1711.08281: Vishal Sharma, Subhashish Banerjee.

66. "Decoherence can help quantum cryptographic security": Quantum Information Processing, **17**, 207 (2018), arXiv:1712.06519: Vishal Sharma, U. Shrikant, R. Srikanth and Subhashish Banerjee.

67. "Probing nonclassicality in an optically-driven cavity with two atomic ensembles": Phys. Rev. A **97**, 063840 (2018); arXiv:1712.04154: Javid Naikoo, Kishore Thapliyal, Anirban Pathak and Subhashish Banerjee.

68. "A study of temporal quantum correlations in decohering B and K meson systems": Phys. Rev. D **97**, 053008 (2018) : Javid Naikoo, Ashutosh K Alok and Subhashish Banerjee.

69. "Thermodynamics of non-Markovian reservoirs and heat engines": Phys. Rev. E **97**, 062108 (2018): arXiv:1801.00744: George Thomas, Nana Siddharth, Subhashish Banerjee and Sibasish Ghosh.

70. "Enhanced non-Markovian behavior in quantum walks with Markovian disorder": Scientific Reports **8**, 8801 (2018); DOI:10.1038/s41598-018-27132-7, arXiv:1802.05478: N. Pradeep Kumar, Subhashish Banerjee and C. M. Chandrashekar.

71. "Non-Markovian dephasing and depolarizing channels": Phys. Rev. A **98**, 032328 (2018); U. Shrikant, R. Srikanth and Subhashish Banerjee.

72. "Quantum correlations and the neutrino mass degeneracy problem": Eur. Phys. J. C **78**, 914 (2018), arXiv:1807.01546: Khushboo Dixit, Javid Naikoo, Subhashish Banerjee and Ashutosh Kumar Alok.

73. "Entropic Leggett-Garg inequality in neutrinos and B (K) meson systems": Eur. Phys. J. C **78**, 602 (2018): Javid Naikoo and Subhashish Banerjee.

74. "Lower- and higher-order nonclassical properties of photon added and subtracted displaced Fock states": Annalen der Physik (Berlin) **531**, 1800318 (2019); Priya Malpani, Nasir Alam, Kishore Thapliyal, Anirban Pathak, V. Narayanan and Subhashish Banerjee.

75. "Study of coherence and mixedness in meson and neutrino systems": Eur. Phys. J. C **79**, 96 (2019): Khushboo Dixit, Javid Naikoo, Subhashish Banerjee and Ashutosh Kumar Alok.

76. "Quantum Zeno effect and nonclassicality in a PT symmetric system of coupled cavities": Phys. Rev. A **99**, 023820 (2019) : Javid Naikoo, Kishore Thapliyal, Subhashish Banerjee and Anirban Pathak.

77. "Leggett-Garg inequality in the context of three flavour neutrino oscillation": Phys. Rev. D **99**, 095001 (2019): Javid Naikoo, Ashutosh Kumar Alok, Subhashish Banerjee, S. Uma Sankar.

78. "Facets of quantum information under non-Markovian evolution": Phys. Rev. A **99**, 042128 (2019): Javid Naikoo, Supriyo Dutta, Subhashish Banerjee.

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