SUMAN KUMAR BANIK

Department of Chemistry
Bose Institute
Kolkata 700 009, India.

Phone: +91-33-2303-1142
Fax: +91-33-2303-6790
E-mail: skbanik@jcbose.ac.in

CURRICULUM VITAE

EDUCATION

Ph. D. (Science)	Jadavpur University, India	2001
M. Sc. (Physical Chemistry)	University of Calcutta, India	1995
B. Sc. (Chemistry)	University of Calcutta, India	1993

PROFESSIONAL EMPLOYMENT

Associate Professor	Department of Chemistry, Bose Institute	01/14-present
Assistant Professor	Department of Chemistry, Bose Institute	11/08-12/13
Postdoctoral Associate	Department of Biological Sciences, Virginia Tech	11/07-10/08
Postdoctoral Associate	Department of Physics, Virginia Tech	10/05-07/07
Research Associate	Indian Association for the Cultivation of Science	03/05-09/05
Postdoctoral Fellow	NORDITA, Nordic Institute for Theoretical Physics	04/04-02/05
Postdoctoral Fellow	Max-Planck Institute for Physics of Complex Systems	07/02-03/04
Research Fellow	Indian Association for the Cultivation of Science	08/96-06/02

RESEARCH INTEREST

Stochastic processes, nonlinear dynamics and theoretical biology

LIST OF PUBLICATIONS

1. S K Banik and D S Ray 1998 Linear systems with adiabatic fluctuations, J. Phys. A **31**, 3937

2. S K Banik, J Ray Chaudhuri and D S Ray 1998 Theory of adiabatic fluctuations: third-order noise, J. Phys. A **31**, 7301

3. J Ray Chaudhuri, S K Banik, B Deb and D S Ray 1999 Modified Bloch equations in the presence of a nonstationary bath, Eur. Phys. J. D **6**, 415

4. S K Banik, J Ray Chaudhuri and D S Ray 2000 Adiabatic noise-induced escape rate for non-equilibrium open systems, Indian J. Chem. **39A**, 300

5. S K Banik, J Ray Chaudhuri and D S Ray 2000 The generalized Kramers' theory for nonequilibrium open one-dimensional systems, J. Chem. Phys. **112**, 8330

6. B C Bag, S K Banik and D S Ray 2001 The noise properties of stochastic processes and entropy production, Phys. Rev. E **64**, 026110

7. J Ray Chaudhuri, S K Banik, B C Bag and D S Ray 2001 Analytical and numerical investigation of escape rate for an external noise driven bath, Phys. Rev. E. **63**, 061111

8. S K Banik, B C Bag and D S Ray 2002 Generalized quantum Fokker-Planck, diffusion and Smoluchowski equations with true probability distribution functions, Phys. Rev. E **65**, 051106

9. D Banerjee, B C Bag, S K Banik and D S Ray 2002 Approach to Quantum Kramers' Equation and Barrier Crossing Dynamics, Phys. Rev. E **65**, 021109

10. D Banerjee, S K Banik, B C Bag and D S Ray 2002 Quantum Kramers' equation for energy diffusion and barrier crossing dynamics in the low-friction regime, Phys. Rev. E **66**, 051105

11. S Kar, S K Banik and D S Ray 2002 A class of self-limiting growth models in presence of nonlinear diffusion, Phys. Rev. E **65**, 061909

12. D Banerjee, B C Bag, S K Banik and D S Ray 2003 Quantum Smoluchowski equation: Escape from a metastable state, Physica A **318**, 6

13. D Barik, S K Banik and D S Ray 2003 Quantum phase space function formulation of reactive flux theory, J. Chem. Phys. **119**, 680

14. B C Bag, D Banerjee, S K Banik and D S Ray 2003 Quantum Brownian motion and generalization of Arhenius rate law, J. Indian Chem. Soc. **80**, 511

15. S Kar, S K Banik and D S Ray 2003 Exact solutions of Fisher and Burgers' equations with finite transport memory, J. Phys. A **36**, 2771

16. D Banerjee, B C Bag, S K Banik and D S Ray 2004 Solution of quantum Langevin equation: Approximations theoretical and numerical aspects, J. Chem. Phys. **120**, 8960

17. S K Banik, T Ambjörnsson and R Metzler 2005 Stochastic approach to DNA breathing dynamics, Europhys. Lett. **71**, 852

18. J Ray Chaudhuri, D Barik and S K Banik 2006 Escape rate from a metastable state weakly interacting with a heat bath driven by an external noise, Phys. Rev. E **73**, 051101

19. J Ray Chaudhuri, D Barik and S K Banik 2006 Dynamics of a metastable state nonlinearly coupled to a heat bath driven by external noise, Phys. Rev. E **74**, 061119

20. T Ambjörnsson, S K Banik, O Krichevsky and R Metzler 2006 Sequence sensitivity of breathing dynamics in heteropolymer DNA, Phys. Rev. Lett. **97**, 128105

21. J Ray Chaudhuri, D Barik and S K Banik 2007 Nonequilibrium fluctuation induced escape from a metastable state, Eur. Phys. J. B **55**, 333

22. J Ray Chaudhuri, S Chattopadhyay and S K Banik 2007 Generalization of escape rate from a metastable state driven by external cross-correlated noise processes, Phys. Rev. E **76**, 021125

23. J Ray Chaudhuri, S Chattopadhyay and S K Banik 2007 Simple model for transport phenomena: Microscopic construction of Maxwell demonlike engine, J. Chem. Phys. **127**, 224508

24. J Ray Chaudhuri, D Barik and S K Banik 2007 Directed motion generated by heat bath nonlinearly driven by external noise, J. Phys. A **40**, 14715

25. T Ambjörnsson, S K Banik, M A Lomholt and R Metzler 2007 Master equation approach to DNA breathing in heteropolymer DNA, Phys. Rev. E **75**, 021908

26. T Ambjörnsson, S K Banik, O Krichevsky and R Metzler 2007 Breathing dynamics in heteropolymer DNA, Biophys. J. **92**, 2674

27. J Ray Chaudhuri, S Chattopadhyay and S K Banik 2008 Multiplicative correlated noise induced escape rate from a metastable state, J. Chem. Phys. **128**, 154513

28. S Bhattacharya, S K Banik, S Chattopadhyay and J Ray Chaudhuri 2008 Time dependent current in a non-stationary environment: A microscopic approach, J. Math. Phys. **49**, 063302

29. J Ray Chaudhuri, S K Banik, S Chattopadhyay and P Chaudhury 2008 Transport and bistable kinetics of a Brownian particle in a nonequilibrium environment, J. Math. Phys. **49**, 113303

30. P Chaudhury, R Metzler and S K Banik 2009 Finding the optimum activation energy in DNA breathing dynamics: a simulated annealing approach, J. Phys. A **42**, 335101

31. S K Banik, A T Fenley and R V Kulkarni 2009 A model for signal transduction during quorum sensing in *Vibrio harveyi*, Phys. Biol. **6**, 046008

32. A Shit, S Chattopadhyay, S K Banik and J Ray Chaudhuri 2010 Generalized Einstein relation in tilted periodic potential: A semiclassical approach, J. Phys. Chem. B **114**, 7854

33. A Shit, S Chattopadhyay, S K Banik and J Ray Chaudhuri 2010 Microscopic realization of cross-correlated noise processes, Chaos **20**, 023130

34. A T Fenley, S K Banik and R V Kulkarni 2011 Computational modeling of differences in the quorum sensing induced luminescence phenotypes of *Vibrio harveyi* and *Vibrio cholerae*, J. Theo. Biol. **274**, 145

35. S Talukder, P Chaudhury, R Metzler and S K Banik 2011 Determining the DNA stability parameters for the breathing dynamics of heterogeneous DNA by stochastic optimization, J. Chem. Phys. **135**, 165103

36. A Shit, S Chattopadhyay, S K Banik and J Ray Chaudhuri 2012 Kramers turnover in class of thermodynamically open systems: Effect of interplay of nonlinearity and noises, Chem. Phys. Lett. **543**, 173

37. A Bandyopadhyay and S K Banik 2012 Positive feedback and temperature mediated molecular switch controls differential gene regulation in *Bordetella pertussis*, Biosystems **110**, 107

38. S Talukder, S Sen, R Metzler, S K Banik and P Chaudhury 2013 Stochastic optimization study of protein dimerization kinetics, J. Chem. Sci. **125**, 1619

39. A K Maity, A Bandyopadhyay, S Chattopadhyay, J Ray Chaudhuri, R Metzler, P Chaudhury and S K Banik 2013 Quantification of noise in bi-functionality-induced post-translational modification, Phys. Rev. E **88**, 032716

40. S Talukder, S Sen, R Sharma, S K Banik and P Chaudhury 2014 A generalized recipe to construct elementary or multi-step reaction paths via a stochastic formulation: Application to the conformational change in noble gas clusters, Chem. Phys. **431-432**, 5

41. A Bandyopadhyay, S Biswas, A K Maity and S K Banik 2014 Analysis of DevR regulated genes in *Mycobacterium tuberculosis*, Syst. Synth. Biol. **8**, 3

42. S Talukder, S Sen, P Chakraborti, R Metzler, S K Banik and P Chaudhury 2014 Breathing dynamics based parameter sensitivity analysis of hetero-polymeric DNA, J. Chem. Phys. **140**, 125101

43. A K Maity, A Bandyopadhyay, P Chaudhury and S K Banik 2014 Role of functionality in two-component signal transduction: A stochastic study, Phys. Rev. E **89**, 032713

44. P Sarkar, A K Maity, A Shit, S Chattopadhyay, J Ray Chaudhuri and S K Banik 2014 Controlling mobility via rapidly oscillating time-periodic stimulus, Chem. Phys. Lett. **602**, 4

45. A Bandyopadhyay, A T Fenley, S K Banik and R V Kulkarni 2015 Theoretical modeling of signal transduction in the quorum-sensing pathway in the Vibrios in *The Physical Basis of Bacterial Quorum Communication*, Springer series in Biological and Medical Physics, Biomedical Engineering, edited by Stephen J Hagen, pp. 7-18 (Springer, New York)

46. A K Maity, P Chaudhury and S K Banik 2015 Role of relaxation time scale in noisy signal transduction, PLOS One **10**, e0123242

47. P Sarkar, A Shit, S Chattopadhyay and S K Banik 2015 Profiling the overdamped dynamics of a nonadiabatic system, Chem. Phys. **458**, 86

48. T Mapder, S Talukder, S Chattopadhyay and S K Banik 2016 Deciphering parameter sensitivity in two-component signal transduction, PLOS One **11**, e0147281

49. A Biswas and S K Banik 2016 Redundancy in information transmission in a two-step cascade, Phys. Rev. E **93**, 052422