

Curriculum Vitae

- Name** : Dr. R. K. Brojen Singh
- Position** : Associate Professor, School of Computational and Integrative Sciences
Jawaharlal Nehru University, New Delhi-110067.
- B. Sc.** : Physics (H), Manipur University, 1993-4 (4th Position).
- M. Sc.** : Physics, Department of Physics, Jamia Millia Islamia, 1997
(First with Distinction, Gold Medalist).
- Ph. D.** : School of Physical Sciences, Jawaharlal Nehru University, 2004.

Personal Homepage: <https://sites.google.com/site/rkbrojen/>

Postdoctoral Experience:

- Department of Computer Science, **University of California**, Santa Barbara, (one Year), October 2016 to September 2017.
- Department of Physics, **University of Technology in Chemnitz, Germany** (one year), 2004.
- **Research Associate** in Centre for Computational Biology and Bioinformatics, SIT, Jawaharlal Nehru University, 2006.
- **CSIR Research Associate** in Centre for Computational Biology and Bioinformatics, SIT, Jawaharlal Nehru University, 2006-2007.

Fellowships and Scholarships:

- National Merit Scholarship in XII and B.Sc.
- Fellowship from **UGC (JRF and SRF)** and one-year **SRF** from **CSIR** during my **Ph.D.**
- Fellowship from **SFG 393 (Germany)** for one year as **Post-Doctoral Fellow**.
- Fellowship from **DBT (India)** for 8 months as **Research Associate**.
- Fellowship from **CSIR (India)** as **Research Associate** started from April 2006.
- Qualified **GATE** (Graduate Aptitude Test in Engineers) in 1999.
- **SERC: Fast Track Scheme for Young Scientists** project 2008-2011.
- Visiting research fellowship to university of Sydney in June 2015

- Raman postdoctoral Fellowship UGC, 2016

Member of Board/Advisory Board of public and private sector corporations.

- National Network for Mathematical and Computational Biology (NNMCB)

Member, Editorial Boards of Peer Reviewed journals:

1. Journal of Big Data and Computational Sciences.
2. Scientific Research Publisher
3. Editorial member of Int. J. Systems Biology

Thesis Examiner:

Jamia Millia Islamia, Guru Gobind Singh Indraprastha University, Indraprastha University, Chaudhary Charan Singh, University, Meerut, The Northcap University, Gurugram, Haryana

Teaching Experience:

Courses taught (Physics): Classical Mechanics, Quantum Mechanics, Mathematical Physics, Electricity and Magnetism, Statistical Mechanics, Optics etc.
(Interdisciplinary) Systems Biology, Stochastic systems, Bioinformatics. Mathematics, Statistics for Biologists.

Research Interests:

Systems Biology and Nanotechnology:

As a field of study, particularly the study of the interactions between the components of biological systems, and how these interactions give rise to the function and behaviour of that system (for example, the enzymes and metabolites in a metabolic pathway). I am interested in computational and mathematical modeling of single cell information processing, deterministic and stochastic dynamics of single cell processes such as genetic regulation, biological rhythms, genetic switch etc. Synchronization of dynamical systems is studied in order to study molecular basis communication, signal processing, etc. I am also interested in DNA sequence analysis (Fourier transform, spectral analysis), stochastic resonance in cellular processes, and study of dynamic instability in microtubules using Monte Carlo techniques.

Non-Linear Dynamics:

Time series analysis of dynamical systems, Bifurcations theory, Stochastic dynamics, Stochastic synchronization, coupling mechanisms, Order parameter for detection of

stochastic synchronization (permutation entropy, phase locking dynamics, correlation function, etc), Generalized stochastic synchronization, Stochastic resonance, Role of noise in stochastic systems.

Theoretical Condensed Matter Physics:

Other area of interest is metal insulator in disordered system, where we research on metal insulator transition of interacting and non-interacting electron systems having specific geometrical shapes, scaling theory of localization, and weak localization in 2D systems and effect of interaction in 2D phase transition using the techniques self-consistent theory of localization, transfer matrix method and finite size scaling theory.

List of Publications

2021

1. Mangangcha, I.R., **R. K. Brojen Singh**, Lebeche, D. and Ali, S., Xanthone glucoside 2- β -D-glucopyranosyl-1, 3, 6, 7-tetrahydroxy-9H-xanthen-9-one binds to the ATP-binding pocket of glycogen synthase kinase 3 β and inhibits its activity: implications in prostate cancer and associated cardiovascular disease risk. *Journal of Biomolecular Structure and Dynamics*, 1-17, 2021.
2. Chanu, Athokpam Langlen, Jyoti Bhadana, and **R. K. Brojen Singh**. Non-Markovian process with variable memory functions. *Ricerche di Matematica*, 1-17, 2021.
3. Shakti Nath Singh, Athokpam Langlen Chanu, Md Zubbair Malik, and **R. K. Brojen Singh**. Interplay of cellular states: Role of delay as control mechanism. *Physica A: Statistical Mechanics and its Applications*, 572, 125869, 2021.
4. Bhadana, Jyoti, Athokpam Langlen Chanu, Md Zubbair Malik, and **R. K. Brojen Singh**. Noise and delay can shape distribution functions in stochastic reaction dynamics. *Nonlinear Dynamics*, 1-15, 2021.
5. R. K. Sanayaima Singh, Md. Zubbair Malik and **R. K. Brojen Singh**. Diversity of SARS-CoV-2 isolates driven by pressure and health index. *Epidemiology & Infection*. 1-7, 2021. (**Corresponding author**).
6. Amit Jangid, Md. Zubbair Malik, Ram Ramaswamy, **R. K. Brojen Singh**, Transition and Identification of Pathological States in p53 Dynamics for Therapeutic Intervention. *Scientific Reports*. 11, 2349, 2021. (**Corresponding author**).

2020

7. Chanu, A. L., & **R. K. Brojen Singh**. Stochastic approach to study control strategies of Covid-19 pandemic in India. *Epidemiology and Infection*, 53 (42), 425002, 2020. (**Corresponding author**).

8. Athokpam, Langlen Chanu, Jyoti Bhadana, and **R. K. Brojen Singh**. Stochastic fluctuations as a driving force to dissipative non-equilibrium states. *Journal of Physics A: Mathematical and Theoretical*, 53(42), p.425002, (2020). **(Corresponding author)**.
9. Irengbam Rocky Mangangcha, Md. Zubair Malik, Ömer Küçük, Shakir Ali, **R.K. Brojen Singh**. Kinless hubs are potential target genes in prostate cancer network. *Genomics*, 112(6), pp.5227-5239, (2020). **(Corresponding author)**
10. Shakti Nath Singh, Md. Zubair Malik and **R. K. Brojen Singh**. Molecular crosstalk: Notch can manipulate Hes1 and miR-9 behavior, *J Theor Biol*, 504, p.110404, 2020 **(Corresponding author)**.
11. Saurav Mandal, Shakti Nath Singh, Md. Zubair Malik and **R. K. Brojen Singh** Stochastic method to control Mycobacterium tuberculosis epidemic. *Computational Biology and Chemistry*, 87, 107250 (2020). **(Corresponding author)**.
12. Shakti Nath Singh, Md. Zubair Malik and **R. K. Brojen Singh**. Towards the revival of oscillation from complete cessation in stochastic systems for application in molecular biology. *Bioinformatics*, 16(3), 274 (2020). **(Corresponding author)**.
13. Indrajit Sharma, **R. K. Brojen Singh**, Jameson Maibam, R. K. Thapa. First-principles phase transitions, elastic properties and electronic structures calculations of cadmium telluride etc, *Materials Research Express*, 3(1),11, 2020.

2019

14. Md Zubair Malik, Keilash Chirom, Shahnawaz Ali, Romana Ishrat, and **R. K. Brojen Singh**. Methodology of predicting key regulators in ovarian cancer network: A network theoretical approach. *BMC cancer*, 19(1), 1129(2019). (Corresponding author).
15. Irengbam Rocky Mangangcha, Md. Zubair Malik, Ömer Küçük, Shakir Ali, **R.K. Brojen Singh**. Identification of key regulators in Prostate cancer from gene expression datasets of patients, *Scientific Reports*, 9,16420 (2019). (Corresponding author).
16. Shazia Haider, Kalaiarasan Ponnusamy, **R.K. Brojen Singh**, Anirban Chakraborti, Rameshwar N.K. Bamezai. Hamiltonian energy as an efficient approach to identify the significant key regulators in biological networks. *PlosOne* (August 2019, Accepted)
17. Kabita Khoirom, Indrajit Sharma, R.K. Brojen Singh, Ramkumar Thapa. Pressure induced structural phase transition and electronic structure of In_{1-x}GaxP alloys: a DFT study. *Turkish J. Phys.* (2019) 43: 127 – 137.
18. Maisnam, Sanjeet, and **R. K. Brojen Singh**. Generalized stability conditions for coupled neural networks with delay feedbacks. *Heliyon* 5, 5, e01643 (2019).
19. Sharma, Saurabh Kumar, Soibam Shyamchand Singh, Dineshchandra Haobijam, Md Zubair Malik, and RK Brojen Singh. Organization in complex brain networks: energy distributions and phase shift. *J Theor Biol*, 476, 30-35 (2019).
20. Bhadana, Jyoti, Md Zubair Malik, and **R. K. Brojen Singh**. Universality in stochastic enzymatic futile cycle. *Applied Mathematical Modelling*, 74, 658-667 (2019).

21. Sanjeet Maisnam, **R.K. Brojen Singh**, Generalization of neuron network model with delay feedback, *Heliyon*, 5(5): e01643 (2019).
22. Sharma, Saurabh Kumar, Dineshchandra Haobijam, Soibam Shyamchand Singh, Md Zubair Malik, and **R. K. Brojen Singh**. Neuronal communication: Stochastic neuron dynamics and multi-synchrony states. *AEU-International Journal of Electronics and Communications*, 100, 75-85 (2019).

2018

23. Sharma, Saurabh Kumar, Md Zubair Malik, and **R. K. Brojen Singh**. Stochastic synchronization of neurons: the topological impacts. *Bioinformation* 14 (9), 504 (2018).
24. L. Herojit Singh, P Sapra, R. K. Brojen Singh. Development of Algorithm of Traditional Kei-Yen Game. *J. Comp. Comm.* 6, 45-56 (2018).
25. Shahnawaz Ali, Md. Zubair Malik, Soibam Shyamchand Singh, Keilash Chirom, Romana Ishrat and **R.K. Brojen Singh**. Exploring novel key regulators in breast cancer network, *PlosOne*, 13(6), e0198525 (2018).
26. Soibam Shyamchand Singh, Dineshchandra Haobijam, Md Zubair Malik, Romana Ishrat, and **R. K. Brojen Singh**. Fractal rules in brain networks: Signatures of self-organization. *Journal of theoretical biology*. **437**, 58-66 (2018).

2017

27. Saurav Mandal, Tanmoy Roy chowdhury, Keilash Chirom, Alok Bhattacharya, and **R. K. Brojen Singh**. Complex multifractal nature in Mycobacterium tuberculosis genome. *Scientific reports*. **7**, 46395 (2017).
28. Md. Zubair Malik, Shahnawaz Ali, Soibam Shyamchand Singh, Romana Ishrat, **R. K. Brojen Singh**. Dynamical states, possibilities and propagation of stress signal. *Scientific Reports* 7, Article number:40596 (2017).
29. Md. Zubair Malik, Md. Jahoor Alam, Romana Ishrat, Subhash M. Agarwal and **R. K. Brojen Singh**. Control of apoptosis by SMAR1. *MolBiosyst*. **13(2)**, 350-362 (2017).
30. Keilash Chirom, Shahnawaz Ali, Md. Zubair Malik, Romana Ishrat, **R. K. Brojen Singh**. Identification of Inference Genes in Breast Cancer Network. *Journal of Biosciences and Medicines*. **5**, 29-42 (2017).

2016

31. Nafis, Shazia, Kalaiarasan Ponnusamy, Mohammad Husain, R. k. Brojen Singh and Rameshwar NK Bamezai. Identification of key regulators and their controlling mechanism in a combinatorial apoptosis network: a systems biology approach. *Molecular BioSystems* **12(11)**, 3357-3369 (2016).
32. Jafri, Haider Hasan, **R. K. Brojen Singh** and Ramakrishna Ramaswamy. Generalized synchrony of coupled stochastic processes with multiplicative noise. *Physical Review*. **E 94(5)**, 052216 (2016).

33. Soibam Shyamchand Singh, Budhachandra Khundrakpam. Andrew T. Reid, John D. Lewis, Alan C. Evans, Romana Ishrat B. Indrajit Sharma, **R. K. Brojen Singh**. scaling in topological properties of brain networks. *Scientific Reports*. **6**, 24926 (2016).
34. Moirangthem Shubhakanta Singh, and **R. K. Brojen Singh**. Power law nature in electron solid interaction, *Advances in Materials Physics and Chemistry (AMPC)*. 2162-5328 (2016)
35. Maibam Jameson, Kh Kabita, B Indrajit Sharma, Dineshchandra Haobijam, **R. k. Brojen Singh**, R. K. Thapa, Density Functional Theory Study of Structural and Electronic Properties of Group V Transition Metal Carbides, *Journal of Nuclear Physics, Material Sciences, Radiation and Application*. **3(2)**, 157–164 (2016).
36. Kh. Kabita, BI Sharma, J.Maibam, **R.K. Brojen Singh** and R.K. Thapa, First principles phase transition, elastic properties and electronic structure calculations for cadmium telluride under induced pressure: density functional theory, LDA, GGA and modified Becke Johnson potential, *Materials Research Express*. **3(1)**, 015901 (2016).

2015

37. Maibam Jameson, Kabita KH., Sharma B. Indrajit, Bhattacharjee Ramendu, Thapa R.K., Singh, **R. K. Brojen Singh**, Density Functional Theory: Band Structure, *Indian J. Phys.*, (2015).
38. Jasleen Gundh, Awaneesh Singh, **R. K Brojen Singh**, Ordering Dynamics in Neuron Activity Pattern Model: An Insight to Brain Functionality. *PloS one*. **10(10)**: e0141463 (2015)
39. Kh Kabita, M Jameson, B Indrajit Sharma, **R. K. Brojen Singh**, R. K. Thapa. A detailed first principle study on the structural, elastic, and electronic properties of indium arsenide (InAs) under induced pressure. *Canadian Journal of Physics*. **94**, 1-8 (2015)
40. Md Zubair Malik, Shahnawaz Ali, Md Jahoor Alam, Romana Ishrat, **R. K. Brojen Singh**, Dynamics of p53 and Wnt cross talk, *Computational biology and chemistry*. **59**, 55-66 (2015).
41. Md. J Alam, S Kumar, V Singh and **R.K. Brojen Singh**, Bifurcation in cell cycle dynamics regulated by p53. *PloS one*. 10.6: e0129620 (2015).
42. Devi, Gurumayum Reenaroy, Md Jahoor Alam, and RK Brojen Singh. Synchronization in stress p 53 network. *Mathematical medicine and biology: a journal of the IMA* 32. **4**, 437-456 (2015).
43. Kh. Kabita, BI Sharma, J.Maibam, **R.K. Brojen Singh** and R.K. Thapa, Structural phase transition of indium arsenide induced pressure: a density functional theory study, *J. Appl. Fund. Sc.* **1**, 10 (2015).
44. Shahnawaz Ali, Md. Z. Malik, Md. J. Alam, R Ishrat and **R. K. Brojen Singh**. Evolutionary trace analysis of p53 protein: A statistical analysis of conserved aminoacids in p53 protein. *J. Bioinformatics and Int. Control*, *J. Bioinformatics and Int. Control*. **3**, 194-201 (2015).
45. Kabita, K., J. Maibam, B. I. Sharma, R. K. Thapa, and **R. K. Brojen Singh**. "First principle study on pressure-induced electronic structure and elastic properties of indium phosphide (InP). *Indian Journal of Physics*. **89 (12)**, 1265-1271 (2015).

2014

46. Shazia Nafis, P. Kalaiarasan, **R.K. Brojen Singh**, Mohd. Husain, Rameshwar N K Bameza, Apoptosis regulatory protein-protein interaction demonstrates hierarchical scale-free fractal network, *Brief. Bioinf.*, 16(4) 675-699 (2014).

47. Shefeeq. T, N Ahmad, Ravins, **R. K. Brojen Singh**. Diffusional Drug Release from Cylindrical Matrices into a Finite Medium with Boundary Layer Effect. *Adv. Sc. Eng. Med.* 948 (2014).
48. J. Maibam, Kh. Kabita, B. I. Sharma, R. K. Thapa and **R.K. Brojen Singh**, A DFT study on electronic structure and elastic properties of AgX (X=C, N) in Rock salt structure, *Inv J. Sc. & Tech*, 114-118 (2014).
49. Kh. Kabita, J. Maibam, B. I. Sharma, **R. K. Brojen Singh** and R. K. Thapa, Density Functiona Theory study on pressure induced structural transformation, elastic properties and electronic structure of gallium arsenide, *Int. J. Inov. & Appl. Stud*, 382-393 (2014).
50. Shefeeq. T, N Ahmad, Ravins, **R. K. Brojen Singh**. Mathematical modeling of diffusional release from cylindrical matrices with a diffusion boundary layer into a finite medium. *Adv. Sc. Eng. Med.* (2014).
51. BA Ahanger, **R. K. Brojen Singh** and Z. A. Ansari. Thermal Perturbation in Dye-Sensitized Solar Cell. *Mat. Focus* 3,1–5, (2014).
52. Kh. Kabita, J. Maibam, B. I. Sharma, R.K.Thapa and **R.K. Brojen Singh**. Density Functional Theory Study of Electronic Structure, Elastic Properties and Phase Transition of Gallium Phosphide (GaP) *Adv. Sc. Eng. Med.* 6, 354 (2014).
53. **R.K.Brojen Singh**. Numerical detection of stochastic to deterministic transition *J. Comput. Nonlinear Dynam* 10(1), 011001, (2014).

2013

54. J.Maibam, Kh. Kabita, BI Sharma, R.K. Thapa and **R.K. Brojen Singh**. A DFT study on electronic structure and elastic properties of AuN in rock salt structure. *Ind.J. Sc.* 3, 76 (2013).
55. Ravins and **R. K. Brojen Singh**. Properties of Fluctuating Network and Self- Organization. *Adv. Sc. Eng. Med.* 5, 1331 (2013).
56. BI Sharma, J. Maibam, R.K. Thapa and **R.K. Brojen Singh**. Study of a model of molecular communication of nanomachines, *J. Sc. Forum* 3, 51 (2013).
57. Lourebam Surjit Singh and **R.K. Brojen Singh**. Significance of the Correlation in Turn-taking Dialogues, *Prague Bull. Math. Lingus.* 99, 75-84 (2013).
58. Kh. Kabita, J. Maibam, B. I. Sharma, **R.K. Brojen Singh** and R. K. Thapa. First Principle Calculation of Pressure-Induced Phase Transition and Band Structure of Gallium Phosphide. *I.J.Appl. Phys.* 9, 17 (2013).
59. Md. J. Alam, G. R. Devi, Ravins, R. Ishrat, S.M. Agarwal and **R. K. Brojen Singh**. Switching p53 states by calcium: Dynamics and interaction of stress systems. *Mol. Biosystems* 9, 508-521 (2013).
60. A. Arora, S. Gera, T. Maheshwari, D. Raghav, Md. J Alam, **R.K. Brojen Singh** and S. M. Agarwal. The Dynamics of Stress p53-Mdm2 Network Regulated by p300 and HDAC1. *PLoS One*. DOI: 10.1371/journal.pone.0052736 (2013).

2012

61. Md. J. Alam, N. Fatima, G. R. Devi, Ravins and **R.K. Brojen Singh**. The enhancement of stability of p53 in MTBP induced p53–MDM2 regulatory network. *Biosystems* 110, 74-83 (2012).

62. Md. J. Alam, G. R. Devi, **R.K. Brojen Singh**, R. Ramaswamy, S. C. Thakur and B. I. Sharma. Stochastic synchronization of interacting pathways in testosterone model. *Comp. Biol. Chem.* 41, 10-17 (2012)."
63. T. Shefeeq, N. Ahmad, Ravins and **R. K. Brojen Singh**, Theoretical Modeling of Diffusional Release of a Dispersed Solute from a Cylindrical Polymeric Matrix. *J. Nanosc. Nanotechnol.* 12, 7167-7171 (2012).
64. Md. Z. Malik, S. Ali, Md. J. Alam, G. R. Devi, Ravins, R. Ishrat, and **R. K. Brojen Singh**. Intercellular Synchronization of Coupled Smooth Muscle Cells via Ca²⁺ Propagation. *J. Nanosc. Nanotechnol.* 12, 1-13 (2012).
65. **R.K. Brojen Singh** and B.I. Sharma, Complexity in the Role of Noise in Stochastic Systems. *J. Comp. Sc. & Syst. Biol.* 5, 16-23 (2012).
66. Md. J.A., Latika B., G.R. Devi, H. D. Singh, **R.K. Brojen Singh**, B. I. Sharma, Stochastic synronization of coupled segmented clocks. *Sc. Adv. Mat.* 4, 156-160(2012)."
67. G. R. Devi, **R.K. Brojen Singh**, B.I Sharma, The Macroscopic to Microscopic transition in inter-oscillator stochastic synchronization in circadian oscillators. *Sc. Adv. Mat.* 4, 166-172 (2012).
68. Md. J. Alam, Latika B, G.R. Devi, H. D. Singh, **R.K. Brojen Singh**, B.I. Sharma Intercellular synchronization of diffusive coupled Ca²⁺ oscillators, *J. Chem. Biol.* 5, 27-34 (2012).

2011

69. J. Maibam , B. I. Sharma, R. Bhattacharjee, R.K. Thapa and **R.K. Brojen Singh**. DFT studies on electronic structure and elastic properties of con: zincblende and rocksalt structures, *PRAJ J. Pure Appl. Sc.* 19, 63-67 (2011).
70. Md. J. Alam, L. Bhayana, G.R. Devi, H.D. Singh, **R. K. Brojen Singh**, B.I Sharma Measurement of phase synchrony of coupled segmentation clocks, *Comp. Biol. Med.* 41, 916-921 (2011).
71. J.Maibam, B.I.Sharma, Ramendu B, R.K.Thapa, **R.K.Brojen Singh**. Electronic Structure and elastic properties of scandium carbide and yttrium carbide: A first principles study *Physica B* 406, 4041-4045 (2011).

2010

72. **R.K. Brojen Singh**, Vikram Singh and Ram Ramaswamy, Stochastic synchronization of circadian rhythms, *J. Sys. Sc. Comp.* 23:978-988 (2010).
73. Sharma, B. I., Maibam, J., Paul, R. S., Thapa, R. K. and Singh, **R. K. Brojen Singh**. Studies on energy bond of NbC and NbN using DFT. *Ind. J. Phy.* 84, 567-570 (2010)."
74. Barman, P., Shubhakanta, S., Maibam, J., Singh, **R. K. Brojen Singh**, B. I., S., Simulation of electron solid interactions in NpC and NbN using Monte Carlo method. *Ind. J. Phy.* 84, 607-612 (2010)."
75. Singh, M. S., **R. K. Brojen Singh**, Khatri, R. and Sharma, B. I., Monte Carlo simulation study of electron beam interaction in multi-layered semiconducting materials. *Advan. Sci. Lett.* 3, 57-61 (2010)."
76. Poddar, N.K., Ansari, Z.A.,Singh, **R.K.B**, Moosavi-Movahedi, A.A., Ahmad, F., Effect of Oligosaccharides and their Monosaccharide Mixtures on the Stability of Proteins: A Scaled Particle Study, *J. Biomol. Struc. Dyn.* 28, 331-334 (2010)."

2009

77. Devi, L. G., Chiru, S. D. P., Devi, G. R. and Singh, **R. K. B.**, Synchronization in the dynamics of P53 protein oscillations. *J. Comp. Intl. Bioinf.* 2, 61-67 (2009)."

							ng Govt. Agency	monograph book
1.	Synchronization in biological systems	Major	2008	2011	15.96 Lacs	Department of Science and Technology	Yes	Published in different reputed journals
2.	Molecular basis synchronization in the dynamics of p53 protein in cancerous cells	Major	2009	2012	6.79 Lacs	University Grants Commission	Yes	Published in different reputed journals
3.	Stochastic synchronization: complexity in signal processing in interacting systems, role of noise and applications	Major	2013	2018	15.27 Lacs	Department of Science and Technology	Yes	Published in different reputed journals
4.	Understanding complexity in brain dynamics	Major	2013	2018	15.27 Lacs	Council of Scientific and Industrial Research (CSIR)	Yes	Published in different reputed journals
5.	In silico modelling of the experimentally obtained genomic and microRNA data	Major	2014	2019	11 Lacs	UPE-II	yes	Published in different reputed journals

Academic programmers attended.

1. 94th Orientation Course (18th October to 16th November 2010), Academic Staff College, Jamia Millia Islamia, New Delhi, India
2. 1st Refresher Course in Basic Sciences (Interdisciplinary) (9th to 27th May 2011), Academic Staff College, Jamia Millia Islamia, New Delhi, India

Conference/ Workshops/ Talks/Poster:

1. Paper presented in the international conference on “**Strongly correlated electron system**”, held at the Saha Institute of Nuclear Physics, Calcutta, October 23-28, 2000.

2. Poster presented in the conference “**Slow dynamics and freezing in condensed matter systems**”, School of Physical Sciences, Jawaharlal Nehru University, New Delhi in March 2001.
3. Attended the workshop “**Modelling and Simulation in Molecular Systems, Mesoscopic structures and Material Science**”, University of Technology in Chemnitz, Germany, 21-23 April 2004.
4. Talk given at Chemnitz University of Technology on 21, November 2004. Topic was “**Self-Consistent Theory of localization**”.
5. Talk given at Centre for computational Biology and Bioinformatics, School of information Technology, Jawaharlal Nehru University on “**Stochastic Resonance in Biological systems**”.
6. Attended “**IMSc Complex Systems School**” held in IMSc Chennai, India in co-operation with the Santa Fe Institute, Santa Fe, USA during January 2-27, 2006.
7. Invited talk in “**Dynamics Day Delhi**” in School of Physical Sciences, Jawaharlal Nehru University, New Delhi on Nov. 5, 2005. Topic was: “**Stochastic Simulation of Rossler chemical reactions**”.
8. Talk given at Centre for computational Biology and Bioinformatics, School of information Technology, Jawaharlal Nehru University on “**Understanding complexity behind dynamic instability of Microtubule**”.
9. Invited talk in “**Computational Biology Day**” at School of Life Sciences organized by Centre for Computational Biology and Bioinformatics, Jawaharlal Nehru University, New Delhi on March 11, 2006. Topic was: “**The Dynamics of Electronic Repressilator of Genetic Networks**”.
10. Invited talk in workshop on Systems Biology held in Himachal University, Shimla during May 4-6, 2006. Title was “**Molecular Noise induced Circadian rhythms: A system Biological approach**”.
11. Attended and presented poster in “International Conference in Bioinformatics (INCOB 2006)”, at Asoka Hotel, New Delhi.
12. Attended conference on “**Complex systems 2007**” on 27th October 2007, Jawaharlal Nehru University.
13. Attended conference on “**Recent trends in Research in Biological Sciences**” on 7th December 2007.
14. Attended seminar on “**Developments in Materials, High energy and Nuclear Physics**” on 20-21 January 2008, Jamia Millia Islamia.
15. Attended seminar on “**Nano-materials and Devices**” on 30th January 2008, Jamia Millia Islamia.
16. Attended conference on “**Mathematics in Biology**” on 4th December 2008, Jamia Millia Islamia.
17. Invited Talk at **Bioinformatics Applications in Systems Biology**, March 3-4, 2010, Department of Computer Science, Jamia Millia Islamia, New Delhi.

18. Invited talk at Department of Physics, Manipur University, July 5, 2010.
19. Interdisciplinary Science Conference: Interface between Computer Science and Biology, Poster: Fauzul Mobeen, Md. Zubair Malik, Md. Jahoor Alam, G Reenaroy Devi, Ravins, RK Brojen Singh, Shahnawaz ali, Md. Badruzzaman, **The stochastic temporal dynamics of Msn2 oscillations in cAMP-PKA-HOG pathway in yeast budding network**, *J. Nat. Sc., Biol. & Med.* **2**, 107 (2011).
20. Interdisciplinary Science Conference: Interface between Computer Science and Biology, Poster: Gurumayum Reenaroy Devi, RK Brojen Singh, **The effect on coupling strength near the deterministic to stochastic transition**, *J. Nat. Sc., Biol. & Med.* **2**, 107 (2011).
21. Interdisciplinary Science Conference: Interface between Computer Science and Biology, Poster: Md. Zubair Malik, Md. Jahoor Alam, G Reenaroy Devi, Ravins, RK Brojen Singh, Shahnawaz ali, Md. Badruzzaman, Fauzul Mobeen, **The impact of chemical coupling on intercellular communication of coupled Ca²⁺ oscillators in hepatocytes**, *J. Nat. Sc., Biol. & Med.* **2**, 101 (2011).
22. Interdisciplinary Science Conference: Interface between Computer Science and Biology, Poster: Md. Zubair Malik, Md. Jahoor Alam, G Reenaroy Devi, Ravins, RK Brojen Singh, Shahnawaz ali, Md. Badruzzaman, Fauzul Mobeen, **The impact of chemical coupling on intercellular communication of coupled Ca²⁺ oscillators in hepatocytes**, *J. Nat. Sc., Biol. & Med.* **2**, 101 (2011).
23. Interdisciplinary Science Conference: Interface between Computer Science and Biology, Poster: Nishat Fatima, Shadab Fatima, Md. Jahoor Alam, Gurumayum Reenaroy Devi, Ravins, RK Brojen Singh, **Impact of high level glucose on P53-Mdm2 dynamics and intercellular communication**, *J. Nat. Sc., Biol. & Med.* **2**, 106 (2011).
24. Interdisciplinary Science Conference: Interface between Computer Science and Biology, Poster: Md. Jahoor Alam, RK Brojen Singh, **Intercellular synchronization among stressed cells coupled via Ca⁺² diffusion**, *J. Nat. Sc., Biol. & Med.* **2**, 106 (2011).
25. Interdisciplinary Science Conference: Protein Folding and Diseases, Poster: Inazamam Ul Haque, Md. Jahoor Alam, RK Brojen Singh, **The control of Glucose concentration level by activated p53 network in stress cells** (2012).
26. Gulfishan Jung, Md. Zubair Malik, Shahnawaz ali, Md. Jahoor Alam, G Reenaroy Devi, Ravins, RK Brojen Singh” **Intercellular communication among a group of circadian oscillators**”, *J Nat. Sc. Biol Med*, Vol.2 Issue.3, 108 (2011)
27. BioWorld-2012: Protein in Diseases and Disorder, Poster: Md. Jahoor Alam, RK Brojen Singh, **Dynamic regulation of p53 induced by PML protein** (2012).
28. Symposium on **Biomolecules** in Motion: Theory and Simulation, Poster: Md. Jahoor Alam, RK Brojen Singh, **Pattern dynamics of p53 states as a phase transition like behaviour** (2012).
29. 7. Abhishek Kujur, Md. Zubair Malik, Shahnawaz Ali, **R.K. Brojen Singh**, Romana Ishrat **"DNA Damage Analysis, a Systems Biology Approach"** International Interdisciplinary Conference on IISC-2012: Protein Folding and Disease, Centre for Interdisciplinary

- Research in Basic Sciences, Jamia Millia Islamia, New Delhi, Journal of Proteins & proteomics, December 2012, pp-JPP46
30. Md. Zubair Malik, Shahnawaz Ali, Md Jahoor Alam, Romana Ishrat & R.K Brojen Singh **"14-3-3 and p53 Protein in cell cycle Regulation: A Computational Model"** National Conference on Recent Trends in Protein Structural Biology, Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi, Journal of Proteins & proteomics, Vol-2, December 2013, pp-JPP46
 31. Shahnawaz Ali, Md. Zubair Malik, , **R.K Brojen Singh** ,Romana Ishrat **"Modeling DNA Damage regulation through p53 Feedback loop"** National Conference on Recent Trends in Protein Structural Biology, Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi, Journal of Proteins & proteomics, Vol-2, December 2013, pp-JPP46
 32. Md. Zubair Malik, Shahnawaz Ali, Murtaza Ali, Aftab Alam, Romana Ishrat, R.K. Brojen Singh, **"Analysing Nutlin-3a Interaction Networks for Antiviral Therapies"**, National Conference on Recent Trends in Molecular Virology 2014, (17-19 November 2014), Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi.
 33. Shahnawaz Ali, Md Zubair Malik, Murtaza Ali, Aftab Alam, Romana Ishrat, R.K. Brojen Singh, **"14-3-3 mediates HCV core protein activation and Tumor suppression."** National Conference on Recent Trends in Molecular Virology 2014 (17-19 November 2014), Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi.
 34. Md. Zubair Malik, Shahnawaz Ali, Md Jahoor Alam, Romana Ishrat, **R.K. Brojen Singh**, **"Crosstalk between p53-MDM2 and Wnt Oscillator via Nutlin and Axin"**, International Conference Computational Biology, NNMCB (28-03 February 2015) Department of Mathematics & Statistics, Indian Institute of Technology Kanpur (IITK).
 35. Saurabh Kumar Sharma, Md. Jahoor Alam and R.K. Brojen Singh, Synchronization of coupled genetic oscillators via miRNA, International Conference Computational Biology, NNMCB (28-03 February 2015) Department of Mathematics & Statistics, Indian Institute of Technology Kanpur (IITK).
 36. Md. Zubair Malik, Shahnawaz Ali, Romana Ishrat, R.K. Brojen Singh, **"Impact of p53-MDM2 Molecular Network on Wnt Signaling"**, National Symposium on Biophysics & Golden Jubilee Meeting of the National Biophysical Society, (14-17 February 2015), Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi, Journal of Proteins & proteomics, Vol. 6, November 1, 2015, pp.-JPP 139.
 37. Shahnawaz Ali, Md. Zubair Malik, Romana Ishrat, **R.K. Brojen Singh**, **"Analyzing Node Interference in Wnt activated p53 repair network"**, National Symposium on Biophysics & Golden Jubilee Meeting of the National Biophysical Society, (14-17 February 2015), Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, New Delhi, Journal of Proteins & proteomics, Vol. 6, November 1, 2015, pp.-JPP 139. Jamia Millia Islamia, New Delhi, Journal of Proteins & proteomics, Vol. 6, November 1, 2015, pp-JPP 121.

International/ National conference/workshop/symposium organize.

1. Convener, **The Conference on Nonlinear Systems and Dynamics, CNSD 2018**, Jawaharlal Nehru University, Delhi, India, October 11-14, 2018.
2. Convener, **A one day International Symposium on Integrative Approaches in Life Sciences**, Jawaharlal Nehru University, Delhi, India, February 15, 2019.

Invited talks

1. Jawaharlal Nehru University
Academic Staff College, HRDC, JNU, from 19th to 30th August 2019
Talk title: **2nd Reference course in E-learning and E Governance**
2. Jawaharlal Nehru University
Academic Staff College, HRDC, JNU, from 16th to 27th September 2019
Talk title: **18th Refresher Course in Computer Sciences and Information Technology on Monday, September 23, 2019.**
3. Shivaji College, University of Delhi.
One Week Faculty Development Programme on Biomathematics, August 1-7, 2019.
Talk Title: **Stochastic dynamic in Biological System**
4. Department of Mathematics and Department of Physics National Institute of Technology Manipur, Imphal-795004 India
Five Day Workshop on Computational & Analytical Methods in Physics & Mathematics, 19-23 February 2019.
Talk Title: **Stochastic process in complex system.**
5. Amity Institute of Neuropsychology and Neurosciences (AINN), Amity University, Noida
Two Day Symposium on Exploring Mind, Brain and Behaviour, March 28-29, 2019.
Talk Title: **Neurons cross-talk: Complex signal processing in brain.**
6. Jawaharlal Nehru University
Academic Staff College, 2018
Talk title: **Bridging science and social sciences: An integrative approach**
7. Jawaharlal Nehru University
Academic Staff College, HRDC, JNU, from 31st December 2018 to 25th January 2019.
Talk title: **5th Refresher Course (Interdisciplinary) in Contemporary Studies (Natural Sciences, Environmental Sciences, Biological Sciences, Demography and Education)**

8. Jamia Millia Islamia,
Academic Staff College, 2014
Talk title: **Systems Biology: A New Field of Biological Research**
9. Jawaharlal Nehru University
Academic Staff College, 2014
Talk title: **Systems Biology: A New Field of Biological Research**
10. Jamia Millia Islamia,
Academic Staff College, 2014
Talk title: **Systems Biology: A New Field of Biological Research**
11. Jawaharlal Nehru University
Academic Staff College, 2014
Talk title: **Systems Biology: A New Field of Biological Research**
12. Himachal University
Workshop on Systems Biology, 2013
Talk title: **Systems Biology: Search for General Biological Laws**
13. Himachal University
Workshop on Systems Biology, 2013
Talk title: **Synchronization: Means of Communication in Biological Systems**

Ph.D. supervised

1. Dr. Saurav Mandal (with Prof. Alok Bhattacharya)
Thesis Title: **Complex Pattern and Self-Organization in NGS Genomic Data**
Year of Award: March 2021
2. Sakti Nath Singh (with Dr. Narindra Sahni, Scis, JNU)
Thesis Title: **Computational study of emergent properties in stochastic systems: The role of Time Delay and noise.**
Year of Award: July 2020
3. Dr. Jasleen Gund
Thesis Title: **Origin and Prediction of Irregularities in Complex Brain Dynamics**
Year of Award: April 2019
4. Dr. Saurabh Kumar Sharma

Thesis Title: **Characterization and Prediction of Complex Brain states and their Switching Mechanism using EEG data.**

Year of Award: April 2019

5. Dr. Rahul Gupta

Thesis Title: **Computational Modelling of Glutamate Diffusion and AMPA Receptor Crowding at Central Excitatory Synapses.**

Year of Award: May 2019

6. Dr. Md. Zubair Malik (with Dr. Romana Ishrat, Jamia Millia Islamia)

Thesis Title: **Computational Study of Complex p53 Network.**

Year of Award: December 2017

7. Dr. Shahnawaz Ali (with Dr. Romana Ishrat, Jamia Millia Islamia)

Thesis Title: **Investigation of Complex Signaling Process in p53 Regulatory pathways Using Graph Theory.**

Year of Award: July 2018

8. Dr. Soibam Shyamchand Singh (with Dr. Romana Ishrat, Jamia Millia Islamia)

Thesis Title: **Understanding the Complex Dynamics and Information Processing in the Brain network.**

Year of Award: December 2016

9. Dr. Ravins

Thesis Title: **Understanding the Dynamics of Biological Network Using Graph Theory.**

Year of Award: June 2014

10. Dr. G. Reenaroy Devi

Thesis Title: **Synchronization of Stochastic Oscillators and its Application to Biology.**

Year of Award: April 2014

11. Dr. Md. Jahoor Alam

Thesis Title: **Molecular Communication: Stochasticity and Synchronization in Dynamics of p53 Pathways in Stress Cells**

Year of Award: March 2014

Ongoing Ph.D. Students under my supervision:

1. **Dineshchandra Haobijam**

Thesis Title:

2. **Rocky Irengbam** (with Prof. Sakir Ali, Jamia Hamdard university)

Thesis Title: Identification of novel key regulators in prostate cancer using network theory and their modulation.

3. Jyoti bhadana

Thesis Title: Stochastic approach to complex systems modeling: Emergence of stochasticity in big data analysis

4. Amit Jangid

Thesis Title: Modeling Biological Systems from sub-cellular to species-level interactions.

5. Kaushal Kumar

Thesis Title: Parameter estimation and prediction in Nonlinear Dynamics

6. Athokpam Langlen Chanu

Thesis Title: Stochastic formalism in complex systems: Big data analytics

7. Keilash Chirom (with Dr. Pallavi Somvanshi, TERI University, New Delhi)

Thesis Title: Analysis of complex hidden patterns in ovarian cancer: A system biology approach

8. Preet Mishra (with Dr. Sapna Ratan SCIS, JNU)

Thesis Title:

9. Shyam Kumar

Thesis Title:

Postgraduate (M.Sc./ M. tech) Students supervised

2020

1. **Aman Soni** (M.Sc.) School of Computational and Integrative Sciences, Jawaharlal Nehru University (2020).
Thesis title: Self-Organized Criticality in a Stochastic Sandpile.
2. **Mohit Redhal** (M.Sc.) School of Computational and Integrative Sciences, Jawaharlal Nehru University (2020).
Thesis title: The effect of female choice on the evolution of positive assortment in the presence of limited mating attempts.
3. **Saurabh kumar singh** (M.Sc.) School of Computational and Integrative Sciences, Jawaharlal Nehru University (2020).
Thesis title: Stochastic Method for Derivative.
4. **Mohd. Maksuf ul Haque** (M.Sc. Bioinformatics) Department of Computer Science, Jamia Millia Islamia, New Delhi. (2020).
Thesis title: Gene Expression Network of Prostate Cancer: Creation and Analysis.

5. **Tulika Sinha** (M.Sc. Bioinformatics) Department of Computer Science, Jamia Millia Islamia, New Delhi. (2020).
Thesis title: Study of Alzheimer's Disease to Identify Novel Therapeutic Drug Targets: Network Theoretical Approach.
6. **Elisha Kumar Beero** (BSc. (Hons) Neurosciences.) Amity Institute of Neuropsychology and Neurosciences (AINN), Amity University, Noida. (2020).
Thesis title: Comparison of expression profiles of brain tumor to identify therapeutic drug targets.
7. **Trishita Barua** (BSc. (Hons) Neurosciences.) Amity Institute of Neuropsychology and Neurosciences (AINN), Amity University, Noida. (2020).
Thesis title: Integrative Gene Network Analysis to identify driver genes of Autophagy.

2019

8. **Abhishek Singh** (M.Sc. Complex Systems) School of Computational and Integrative Sciences, Jawaharlal Nehru University (2019).
Project title: Multifractal Analysis of Financial Time Series.
9. **Shivam Prajapati** (M.Sc. Complex Systems) School of Computational and Integrative Sciences, Jawaharlal Nehru University (2019).
Project title: Emergence of multifractality in Chikungunya.
10. **Amit Lalwani** (B.Sc. Neuroscience) Amity University, Noida, India (2019)
Project title: Understanding the various components and topological properties of Alzheimer's disease gene-gene interaction network.
11. **Simran Kaur Bahia** (B.Sc. Immunology), Amity University, Noida, India (2019)
Project title: Identification of driver gene in acquired immunodeficiency syndrome (AIDS) from gene expression datasets of patients.
12. **Kajal Sharma** (M.Sc. Bioinformatics), Department of Bioinformatics, Central University of Bihar, Patna (2019).
Project title: Exploring novel key regulator in head and neck cancer network.
13. **Himakshi Bharali** (M.Sc. Bioinformatics), Department of Bioinformatics, Central University of Bihar, Patna (2019).
Project title: Identification and characterization of novel key genes in polycystic ovarian syndrome network.

2018

14. **Srishti Seth** (M.Sc. Biotechnology) Department of Biotechnology, TERI, University (2018)
Project Title: Identification and characterization of novel key genes in polycystic ovarian syndrome network.
15. **Soibam Dainandtab Singh** (M.Sc.), Department of Biotechnology, Manipur University (2018).

Project title: Network Theoretical Analysis of Head and Neck Cancer Genes Organization.

16. **Surbhi Nautiyal** (M.Sc.), Department of Biotechnology, TERI, University (2018)

Project title: Identification of key regulators in chronic kidney disease: a systems biology approach.

17. **Heena Afreen** (M.Sc.), Department of Computer science, Jamia Millia Islamia (2018)

Project title: Identifying the target gene of human due to alternation done by dengue virus by constructing the gene network.

2016

18. **Puja Choudhary** (M. Tech.), SCIS, JNU (2016)

Project title: Self-organization in neuron dynamics.

19. **Sangita** (with Prof. Anirban Chakraborty) SCIS, JNU

20. **Shabab Akbar** (M. Tech.), SCIS, JNU (2016)

Project title: Origin of complexity in p53 regulatory network.

21. **Rajpati Verma** (M. Tech.), SCIS, JNU (2016)

Project title: Moran effect in ecological dynamics

2015

22. **Chandrani Kumari** (B.tech) Cluster Innovation Centre University of Delhi (2015)

Project title: Stochastic Dynamics of P53 induced by Motif Function

23. **Pavitra Selva kumar** (B.tech), Cluster Innovation Centre University of Delhi (2015)

Project title:

2014

24. **Saurabh Kumar Sharma** (M. Tech.) SCIS, JNU (2014)

Project title: Synchronization of Genetic Oscillator Induced by mi-RNA

25. **Shakti Nath Singh** (M.Tech.) SCIS, JNU (2014)

Project title: Role of Delay in Stochastic Systems and Simulations

26. **Yasmin Fatima** (M.Sc.) Jamia Millia Islamia (2014)

Project title: The Impact of Noise and Ck2 in Circadian Rhythm in Drosophila

27. **Maisnam Sanjeet Singh** (Summer Trainee) IISER Kolkata (2014)

Project title: Mathematical Analysis of Chemical Langevin Equation Applied to Bistable Systems in Foraging Colonies.

28. **Kumawat Kishor** (M.Sc.) Central University of Rajasthan (2014)

Project title: Understanding Stochastic Simulation Algorithm of Bio-molecular Network.

2013

29. **Sazia Kunwar** (M.Sc.) Jamia Millia Islamia (2013)

Project title: Impact of the mi-RNA upon the stability of p53 in Stress System

30. **Mehdarakhsha** (M.Sc.) Jamia Millia Islamia (2013)

Project title: The Role of Akt Protein in The Modulation of p53 Dynamics

31. **Mubashara Fatima** (M.Sc.) Jamia Millia Islamia (2013)

Project title: The Signal Processing Mechanism of Genetic Oscillation in FFL Network Motif Topology

32. **Kavita Tiwari** (M.Sc.) Jamia Millia Islamia (2013)

Project title: Modulation of PER2 Stability due to the Impact of MDM2 in Stress Cell

33. **Sanjay Kumar** (M.Sc.) Jamia Millia Islamia (2013)

Project title: Effect of p53-MDM2 Modules on Cell Cycle by p21 Adaptor Protein.

2012

34. **Nishat Fatima** (M.Sc.) Jamia Millia Islamia (2012)
Project title: The Diffusion of MTBP Proteins in Cellular Process and Its Impact on p53-Mdm2 Pathway.
35. **Shadab Fatima** (M.Sc.) Jamia Millia Islamia (2012)
Project title: The Impact of Irradiation on p53-MDM2 Regulatory Mechanism in Cellular Processes
36. **Md Zubair Malik** (M.Sc.) Jamia Millia Islamia (2012)
Project title: Intercellular Ca²⁺ Oscillation in Hepatocytes: A stochastic Simulation Approach.
37. **Fauzul Mobeen** (M.Sc.) Jamia Millia Islamia (2012)
Project title: Dynamics of Msn2 Oscillations in cAMP-PKA-HOG pathway in Yeast Budding: A Stochastic Simulation Approach
38. **Md Baduruzzaman** (M.Sc.) Jamia Millia Islamia (2012)
Project title: The effect of diffused drug and noise in the stochastic model of rat hepatocytes
39. **Gulfisha Jung** (M.Sc.) Jamia Millia Islamia (2012)
Project title: Intercellular communication among a group of circadian oscillators.

2011

40. **Inzamam Ul Haque** (M.Sc.) Jamia Millia Islamia (2011)
Project title: The Control of Glucose concentration by Activated p53 Network in Stress cells: A Computational Approach
41. **Yushra Khan** (M.Sc.) Jamia Millia Islamia (2011)

E. Project fellow

1. Kirti Gupta (**under DST funded project**)
2. Keilash Chirom (**Under UPE-II project**)