

CURRICULUM VITAE

PROFESSOR (DR.) SUBHENDU GHOSH(Retired)

Department of Biophysics

University of Delhi South Campus.

Benito Juarez Road.

New Delhi 110021.

e-mail: profsubhendu@gmail.com; subho@south.du.ac.in; phone: +91 9643168735;

WhatsApp: +91 9968018654

Webpage: <https://sites.google.com/view/profsubhendughosh/>

www.subhendughosh.com

Academic Qualification

PhD in BIOPHYSICS of Ligand-DNA interaction from Jawaharlal Nehru University, New Delhi. 1984.

M.Phil. in BIOPHYSICS from Jawaharlal Nehru University, New Delhi, 1980.

M.Sc. in PHYSICS from Jawaharlal Nehru University, New Delhi, 1978.

B.Sc. from Calcutta University (*Presidency College*), 1975.

Research Interest

- a. **Cognitive Neuroscience:** 'How we learn and how we remember' are important questions for the human society. While little is known about it we are looking into the theory of learning, especially the neural mechanism of learning and the role of synaptic dynamics in this phenomenon. Subsequently we are interested in the biology of Emotions. The inputs are from Behavioral Science, Neurophysiology, Computer Science (Artificial neural Network) and Mathematics.
- b. **Ion Channels and Electrophysiology:** We study Voltage Dependent Anion Channel (VDAC) from mitochondria and Gap Junctions (Electrical Synapse) from Rat Brain Cells by advanced Electrophysiological method (Patch-Clamp & Bilayer Electrophysiology). Single and multi-channel recordings are carried out by us at various voltages on native channels as well as after phosphorylation by Protein Kinases and interaction of Ligands like ATP, Bax, Bid. Analyses of these electrophysiological data reveal the processes involved in the gating of the channels, e.g. control of ion flux through the channels and their self-organization.
- c. **Apoptosis and Neuronal Disorders:** One of the active areas of our research is the mechanism of cell death mediated by Cytochrome C. This is being carried out through bilayer electrophysiology and patch-clamp studies. This has important consequences in understanding neuronal disorders like Alzheimer, Parkinson, Amnesia, Dementia etc.
- d. **Theoretical Biology:** We develop Mathematical Models based on Stochastic and Nonlinear Dynamics and carry out Computational Analyses with the experimental data for better understanding of the complexities of the biological phenomena. The methods include Fourier Analyses, Fractal Analysis, Noise Analysis etc.

Research Experience

- ✓ Worked on interaction of DNA with Ligands, e.g. carcinogens, mutagens, anticancer agents, proteins and radiations with an emphasis on structural and conformational aspects. Expertise in spectroscopic methods e.g. absorption, fluorescence, CD & ORD. Experience in NMR.

- ✓ Worked on structural and functional studies of membrane channels e.g. porins, Voltage Dependent Anion Channel, gap-junctions, K & Ca channels, peptide channels etc. The work involves biochemical, electrophysiological (**patch-clamp**) and spectroscopic experiments.
- ✓ Expertise in mathematical modeling, e.g. stochastic and nonlinear modeling, Fractal Geometry in biology and computer applications.

Employment

- 2006-2017: **Professor**, Department of Biophysics, **University of Delhi South Campus**.
- 2017-2020: **Professor & Head**, Department of Biophysics, **University of Delhi South Campus**.
- 2005-2007: **Professor**, Department of Animal Sciences, School of Life Sciences and Center for Cognitive Science, **University of Hyderabad**
- 2010-2011: **Guest Scientist** at the **Max Planck Institute for the Physics of Complex Systems, Dresden, Germany**.
- 1998-2005: **Associate Professor & Head**, Department of Biophysics, **University of Delhi South Campus**.
- 1988-1998: **Lecturer** (including Sr. Grade), Department of Biophysics, **University of Delhi South Campus**.
- 1992: **Visiting Scientist** at the **Northwestern University Medical School, Chicago**.
- 1998: **Visiting Scientist** at the **University of Chicago Medical School, Chicago**.
- 1986-1988: **Research Associate** at the Department of Biophysics, **University of Delhi South Campus**.
- 1985-86: **Research Officer & Principal Investigator** in **DST Young Scientist Project** (Self-employed) at Jawaharlal Nehru University, New Delhi.
- 1984-85: **Post-Doctoral fellow** at Jawaharlal Nehru University, New Delhi.

Undertook projects

- I. *DNA Conformation, Dynamics and Radiation Damage* funded by DST under Young Scientists' Scheme during 1985-86.
- II. *Gating of Protein Channels in Biomembranes* (CSIR, Govt. of India funded).
- III. *Mitochondrial Porin: Studies on its Regulation* (CSIR, Govt. of India funded).
- IV. *Gating Kinetics of Passive Diffusion Channels: A Dynamic Approach* (CSIR, Govt. of India funded).
- V. *Investigating Collective Behaviour of Passive Diffusion Channels* (DST funded).
- VI. *Role of Voltage Dependent Anion Channel in Mitochondria Mediated Apoptosis: Studies on Interaction with MAP kinase and Bax* (BRNS, BARC, DAE funded).
- VII. *Structure-Function studies on a membrane protein from Chikungunya Virus* (DBT funded)

Visits & Lectures:

- **Gordon Research Conference on Molecular & Ionic Clusters**, Ventura, **California, USA**, 26-31 January, 2020.
- Summer Solstice 2019: Conference on Discrete Models of Complex Systems, **Max Planck Institute of Physics of Complex Systems, Dresden, Germany**, 15-17 July, 2019.
- National Symposium on Applied Spectroscopy, **U.P. College, Varanasi**, 19-20 February, 2019.
- Recent advancements in Neurophysiology and Neuropharmacology-2018RANN 2018, **GLA University, Mathura**, 2-3 November, 2018.
- Invited talks at the **Technical University of Dresden, Germany**
- Visited Centre for Informatics (ZIH), **Technical University, Dresden**, 2019, 2017, 2016, 2015, 2014, 2013, 2010, 2009.
- Delivered invited talk at the Institute of Physical Chemistry, **University of Heidelberg**, June, 2014.
- Delivered invited talk at a conference **Networks & Nonlinearity in Musical Experience**, **Bielefeld University**, Germany, March, 2011.
- Delivered invited talk at the **Max Planck Institute for Human Cognitive & Brain Sciences, Leipzig**, October, 2009.
- Delivered invited talk at the **Humboldt University, Berlin**, October, 2009.
- Delivered invited talk at the **University College of London, Ear Institute, London**, May 2009.
- Delivered invited talk at the **Medical University, Vienna**, October, 2009.
- Delivered invited talk at the **Technical University, Dresden**, June, 2009.
- Visited **Institute of Molecular Physiology & Genetics, Bratislava, Slovak Republic**, March-April, 2009 on Bilateral Exchange Program (INSA-Slovak Academy of Sciences).
- Delivered invited talks at **Albert Einstein School of Medicine, New York**, August, 2006, **Florida Atlantic University**, September, 2006, **Kegg Graduate Institute, Claremont**, September, 2006, **Birming Young University, Utah**, September, 2006 (USA).
- Visited Italy as an UGC delegate under **Indo-Italian Cultural Exchange Programme**, 2-12 March, 2005 (Rome, Catania, Genova)
- Presented paper in **FEBS Workshop on Systems Biology**, Gosau (Salsburg), Austria, 12-18th March, 2005.
- Delivered invited talk at **European Molecular Biology Laboratory, Heidelberg**, March, 2005.
- Delivered invited talk at **German Cancer Research Institute, Heidelberg**, March, 2005
- Delivered invited talk at **Technical University of Dresden**, March, 2005
- Delivered invited talk at **Technical University, Graz, Austria**, April, 2005
- Delivered invited talk at **University of Catania, Sicily, Italy**, March, 2005.
- Delivered invited talk at **Institute of Molecular Physiology & Genetics, Bratislava, Slovak Republic**, March, 2005.

- Nominated as the **Member of the Organizing Committee**, WSEAS International Conference on CELLULAR & MOLECULAR BIOPHYSICS- BIOPHYSICS & BIOENGINEERING, Athens, July-15-17, 2005.
- Papers presented at **Gordon Research Conference on (i) Theoretical & Mathematical Biology, Tilton, USA, 1992 & 1998**, on (ii) **Membrane Channel Proteins, University of New England, 2006, USA**.
- Papers presented at **MTBiol workshop on Experiments & Models in Biology, Dresden, Germany, 2001**.
- Delivered invited talk at **University of Colombia, Missouri (USA)** in 1998.
- Delivered invited talks at (i) **University of Damstadt**, (ii) **University of Wuzberg**, (iii) **University of Achen**, (iv) **University of Munichen (Germany)** in 2001.
- Delivered invited talks at **Institute of Biophysics & Cybernetics, Genova (Italy)** in 2001.
- Papers presented at **Symposium on Theoretical Biology**, Stockholm, 1982,
- Delivered invited talks at a number of Universities and Research Institutes and at several National & International meetings all over India.

Publications

1. Sharma, Bhanu., Kote, Daniel, T. & Ghosh, S. (2023) *Nitric oxide modulates NMDA receptor through a negative feedback mechanism and regulates the dynamical behavior of neuronal postsynaptic components*. **Biophysical Chem.** 103, 107114.
2. Kumar, Jitender, Das Gupta, Patrick & **Ghosh, S.** (2023) *Effects of nonlinear membrane capacitance in the Hodgkin Huxley model of action potential on the spike train patterns of a single neuron* **Europhys. Letters**, **142**, 67002, 1-7.
3. Sharma, Bhanu., Kumar, Spandan, **Ghosh, Subhendu** and Singh, Vikram (2023) *Emergent dynamics in an astrocyte-neuronal network coupled via nitric oxide*. **Physical Biology**. **20** (5) 056006.
4. T. Daniel Tukhang Koren, Rajan Shrivastava & **Ghosh, S** (2023) *Ca²⁺/Calmodulin-Dependent Protein Kinase II Disrupts the Voltage-Dependency of the Voltage-Dependent Anion Channel (VDAC) on Lipid Bilayer Membrane* **J. Phys. Chem. B**, **127**, 3372-3381.
5. Shumaila I. Siddiqui, Malik, C. & **Ghosh, S.** (2023) *Voltage Dependent Anion Channel and its interaction with N-Acetyl-L-Cysteine (NAC) under oxidative stress on Planar Lipid Bilayer*. **Biochimie**, **209**, 150-160.
6. Malik, C. & **Ghosh, S.** (2022). *A mutation in the S6 segment of the KvAP channel changes the secondary structure and alters ion channel activity in a lipid bilayer membrane*. **Amino Acids**, **54**,1461–1475.

7. T. Daniel Tukhang Koren, Rajan Shrivastava, Shumaila I. Siddiqui & **Ghosh, S** (2022) *Calmodulin Modulates the Gating Properties of Voltage-Dependent Anion Channel from Rat Brain Mitochondria* **J. Phys. Chem. B**, **126**, 4857–4871.
8. T. Daniel Tukhang Koren & **Ghosh, S** (2022) *Homocysteine-thiolactone Modulates Gating of mitochondrial Voltage-Dependent Anion Channel (VDAC) and protects it from induced oxidative stress* **J. Mem. Biol.** **255(1)**, 79-97.
9. Malik, C., Siddiqui, S.I. & **Ghosh, S.** (2022) *Extracellular Signal-Regulated Kinase1 (ERK1)-Mediated Phosphorylation of Voltage-Dependent Anion Channel (VDAC) Suppresses its Conductance.* **J. Mem. Biol.** **255(5)**, 107–116.
10. Shrivastava, R. & **Ghosh, S.** (2021). *Collective Dynamics of Ion Channels on Bilayer Lipid Membranes.* **ACS Omega.** **6**, 7544-7557.
11. Malik, C. & **Ghosh, S.** (2020). *Modulation of the Mitochondrial Voltage dependent Anion Channel (VDAC) by Hydrogen Peroxide and its Recovery by Curcumin.* **Eur. Biophys. J.** **49**, 661-672.
12. Malik, C. & **Ghosh, S.** (2020) *Regulation of Single Channel Conductance of Voltage Dependent Anion Channel by Mercuric Chloride in a Planar Lipid Bilayer.* **J. Mem. Biol.**, **253(4)**, 357-371.
13. Malik, C. & **Ghosh, S.** (2020). *Quinidine Partially Blocks Mitochondrial Voltage-Dependent Anion Channel (VDAC).* **Eur. Biophys. J.** **49**, 193-205.
14. Talukdar, S., Shrivastava, R. & **Ghosh, S.** (2019). *Modeling Activity Dependent Reduction in After hyper-polarization with Hodgkin Huxley Equation of Action Potential.* **Biomed. Phys. Eng. Express** **5**, 047001.
15. Talukdar, S. & **Ghosh, S.** (2019). *Tackling Racial Prejudice with Music: A Perspective.* **Omni Science**, **9(3)**, 12-14.
16. Debajit Dey, Shumaila Iqbal Siddiqui, Sukanya Ghosh, Prabhudutta Mamidi, Chandra Shekhar Kumar, Soma Chattopadhyay, **Subhendu Ghosh** & Manidipa Banerjee (2019) *The effect of amantadine on a ion channel protein from Chikungunya virus* **PLoS Neglected Disease**, **13 (7)**, e0007548, 1-22.
17. Gupta, R., & **Ghosh, S.** (2017). *Phosphorylation of purified mitochondrial Voltage-Dependent Anion Channel by c-Jun N-terminal Kinase-3 modifies channel Voltage-Dependence.* **Biochimie Open** **4**, 78-87.
18. Gupta, R., & **Ghosh, S.** (2017). *Putative roles of mitochondrial Voltage-Dependent Anion Channel, Bcl-2 family proteins and c-Jun N-terminal Kinases in ischemic stroke associated apoptosis.* **Biochimie Open** **4**, 47–55.
19. Gupta, R., & **Ghosh, S.** (2017). *JNK3 phosphorylates Bax protein and induces ability to form pore on bilayer lipid membrane.* **Biochimie Open**, **4**, 41-46.
20. Shrivastava, R., Malik, C. & **Ghosh, S.** (2016) *Open channel current noise analysis of S6 peptides from KvAP channel on bilayer lipid membrane shows bimodal power law scaling.* **Physica A**, **451**, 533-540.
21. Gupta, R. & **Ghosh, S.** (2015) *Bax and Bif-1 proteins interact on Bilayer Lipid Membrane and form pore.* **Biochem. Biophys. Research Comm.** **463 (4)**, 751-755.
22. Gupta, R. & **Ghosh, S.** (2015) *Phosphorylation of Voltage-Dependent Anion Channel by c-Jun N-terminal Kinase-3 leads to Closure of the Channel.* **Biochem. Biophys. Research Comm.** **459(1)**, 100-106.
23. Bhattacharjee, A., Das, M.K. & **Ghosh, S.** (2014) *Synchronization in a Ring of Unidirectionally Coupled FN Neurons.* **Int. J. Biomaths.** **7(1)**, 1450009.

24. Malik, C. & Ghosh, S. (2013) *S6 Peptide derived from KvAP Channel forms Multi-Channels on Bilayer Lipid Membrane and shows Cooperativity in Gating*. **PLOS ONE** **8** (11), e78845.
25. Das, M.K., Bhattacharjee, A., Bhatraju, N.K., Yuasa, M. & **Ghosh, S** (2012) *Effect of Dynamic Threshold on the Response and Bifurcation in a Space Clamped FHN Model with External Stimulus*. **Science & Technology** (Kinki University, Japan), **24**, 1-9.
26. Das, M.K., Bhattacharjee, A., Bhatraju, N.K., Yuasa, M. & **Ghosh, S** (2012) *Influence of Time Varying Threshold and Noisy External Stimulus on the Firing Pattern of FHN Neuron Model*. **Jnanabha**, **42**, 1-14.
27. Verma, R., Malik, C., Azmi, S., Srivastava, S., Ghosh, S., & Ghosh, J.K. (2011) *A Synthetic S6 segment derived from KvAP channel self-assembles, permeabilizes lipid vesicles and also exhibits ion channel activity in bilayer lipid membranes*. **J. Biol. Chem.**, **286** (28), 24828-24841.
28. Das, M.K., Bhatraju, N.K., Yuasa, M. & **Ghosh, S** (2010) *Wavelet Analysis of Dynamical Systems*: **Rev. Bull. Cal. Math. Soc.** **18**(2), 167-172.
29. Yadav, C, Verma, M. & Ghosh, S. (2010) *Statistical Evidence for power law temporal correlations in Exploratory Behavior of Rat*. **BioSystems**, **102**, 77-81.
30. Mitra, B., Sharma, S., Das, A.B., Henry, S.L., Das, T.K., Ghosh, P., **Subhendu Ghosh** and Mohanty, P. (2008). *A Novel Cadmium Induced Protein in Wheat: Characterization and Localization in Root Tissue*. **Biologia Plantarum**, **52**(2), 343-346.
31. Manna, S., Banerjee, J. & **Ghosh, S.** (2007) *Breathing of Voltage Dependent Anion Channel as Revealed by Fractal Properties of its Gating*. **Physica A**, **386**, 576-580.
32. Banerjee, J., Singh, J., Joshi, M.C., **Ghosh, S.** & Banerjee, N. (2006) *The cytotoxic fimbrial structural subunit of Xenorhabdus nematophila is a pore-forming toxin*. **J. Bacteriology**, **188** (22), 7957-7962.
33. Verma, M., Manna, S. & **Ghosh, S.** (2006) *Universal Scaling Laws for Large Events in Driven Non-equilibrium Systems*. **Europhys. Lett.** **76**(6), 1050-1056.
34. Banerjee, J. & **Subhendu Ghosh** (2006) *Phosphorylation of Rat Brain Mitochondrial Voltage Dependent Anion Channel as a Potential Tool to Control Leakage of Cytochrome C*. **J. Neurochem.** **98**, 670-676.
35. Banerjee, J., Verma, M.K., Manna, S. & **Subhendu Ghosh** (2006) *Self-organised Criticality and 1/f Noise in Single-Channel Current of Voltage Dependent Anion Channel*. **Europhys. Lett.**, **73** (3): 457-463.
36. Ghosh, P. & **Subhendu Ghosh** (2005). *Investigating Collective behaviour of Gap-Junction Channels*. **Bioelectrochemistry**, **68**: 155-162.
37. Banerjee, J. & **Ghosh, S.** (2005) *Role of Voltage Dependent Anion Channel (VDAC), Bax and Bid in Cell Death: An Electrophysiological Study*(Abstract), **FEBS J.** **272** (s1): 27.
38. Banerjee, J. & **Ghosh, S.** (2005) *Investigating Interaction of ligands with Voltage Dependent Anion Channel through Noise Analyses*. **Arch. Biochem. Biophys.** **435**: 369-371.
39. Banerjee, J. & **Ghosh, S.** (2004) *Bax increases the pore size of rat brain mitochondrial VDAC in the presence of Bid*, **Biophys. Biochim. Res. Comm.** **323**: 310-31
40. Banerjee, J. & **Ghosh, S.** (2004) *Interaction of mitochondrial Voltage-Dependent Anion Channel from Rat Brain with Plasminogen Protein leads to Partial Closure of the Channel*. **Biochim. Biophys. Acta (Biomembrane)**, **1663**: 6-8.

41. Mitra, B., S. L. Henry, P. Ghosh, J. Mishra, T.K. Das, C.R.Babu, P. Mohanty and **Subhendu Ghosh** (2004). *Novel mode of resistance to Fusarium infection by a mild dose pre-exposure of cadmium in wheat.* **Plant Physiol. Biochem**, **42**: 781-787.
42. Vijayvargiya, V, Bose, D., Ghosh, P. & **Ghosh, S.** (2003) *Collective Behaviour of Crown Channels.* **Eur. Biophys. J.**, 32:724-728.
43. Ghosh, P. **Ghosh, S.** & Das, S. (2002) *Self-Regulation of Gap Junctions by Phosphorylation.* **Biochim. Biophys. Acta**, 1564: 500-504
44. Bera, A.K. & **Ghosh, S.** (2001) *Dual Mode of Gating in Voltage Dependent Anion Channel,* **J. Structural Biol.** 135:67-72.
45. **Ghosh, S.** & Bera, A.K. (2001) *Role of H⁺ Concentration on the Capacitance of A Membrane Channel,* **J. Theoretical Biology**, 208:383-384.
46. **Ghosh, S.** & Bera, A.K. (1999) *Nonlinear Electrical Capacitance of Voltage Dependent Anion Channel.* **J. Biosciences**, **24**(supplement 1):129 (Abstract).
47. **Ghosh, S.**, Bera, A.K., and Das, S. (1999) *Evidence for Nonlinear Capacitance in Biomembrane Channel System.* **J. Theoretical Biology**, **200**(3):299-302.
48. Ghosh, P. & **Ghosh, S.** (1999) *Regulation of Gap Junction by ATP.* **J. Biosciences**, **24**(supplement 1):129 (Abstract).
49. Singh, K.K. & **Ghosh, S.** (1998) *Restriction in the Cleavage Activity of Hammerhead Ribozyme.* **J. Biosciences**, **23**(1):1.
50. Pattnaik, B.R., **Ghosh, S.** and Rajeshwari, M. (1997). *Tryptophan Fluorescence of E.coli Ompf* **Biochemistry & Molecular Biology International**, **42**(1):173.
51. Bera, A. K., **Ghosh, S.** and Das, S. (1995) *Mitochondrial VDAC can be phosphorylated by cyclic AMP dependent protein kinase.* **Biochem. Biophys. Res. Comm.** **209**(1): 212.
52. **Ghosh, Subhendu** and Ghosh, Santibrata (1995): *Role of site Mobility in adsorption: A Statistical Thermodynamical Approach.* **J. Chem. Education**, **72**:6
53. **Ghosh, S.** (1993): *Relaxation of Membrane Channels : A Statistical Mechanical Approach,* **J. Theor. Biol.**, **165**(2):171.
54. **Ghosh, S.** and Mukherjee, A.(1993): *Statistical Mechanics of Membrane Channels.* **J. Theoretical Biol.**, **160**(2):61.
55. **Ghosh, S.** (1992): *Ising model for B-Z Transition in Supercoiled DNA.,* **Bull. Math. Biol.** **54**(5):727.
56. Mookerjee, A. and **Ghosh, S.** (1987): *Radiation Induced Adsorption of DNA.* **J. Surface Sci. & Tech.**, **2**(2):61.
57. **Ghosh, S.** and Mookerjee, A. (1986): *A model for cooperative binding of ligand to complementary sites of DNA,* **Bull. Math. Biol.**, **48**(1):2.
58. **Ghosh, S.** and Mookerjee, A. (1981): *Estimation of binding sites from the adsorption profiles of complexed DNA,* **Int. J. Quantum Chem.**, **20**:185.

a. Articles & Books/ Proceedings

59. Talukdar, Sandipan & **Ghosh, Subhendu** (2022) *Biophysics of Brain Plasticity & its Correlation to Music Learning. In: Advances in Speech and Music Technology: Computational Aspects and Applications.* Ed. Anupam Biswas, Springer.

60. **Subhendu Ghosh** (2023). *Collective Phenomena: From Cells to Society*. CRC press (in preparation).
61. **Subhendu Ghosh** *Biophysical Chemistry*. In: *Textbook of Biotechnology*, Ed. H.K. Das, Wiley, 1st Edition (2004): pp 720-750; 2nd Edition (2005): pp 765-798; 3rd Edition (2007): pp 141-168. 5th Edition (2017) pp131-148.
62. Talukdar, S. & **Ghosh, S.** (2015) *How Repeated Listening helps Learning a Musical Pattern?* Proceedings of the International Symposium: Frontiers of Research on Speech & Music, IIT Kharagpur, pp86-89.
63. **Ghosh, S. et al.** (2013) *Socio-Cultural basis of Brain Activities during Perception and Cognition of Music*. Ed. S. Bandopadhyay, Proceedings “International Seminar on Creating & Teaching Music Patterns”, Kolkata, pp299-302.
64. **Ghosh, S. et al.** (2008) *Electrical Noise in Cells, Membranes & Neurons*. In: **Complex Dynamics of Physiological Systems: from Heart to Brain**. Ed. Dana et al. Springer, pp284-297.
65. **Ghosh, S.** (2008) *Single Channel Electrophysiological Recordings as a Sensitive Tool to Study Ion Channels*. In: Proceedings of the Seminar on “Therapeutic Use on Ion Channels”, Indian Veterinary Research Institute, Bareilly, pp7-12.
66. Bhattacharjee, A., Das, M.K. & **Ghosh, S.** (2008) *Random Noise complements for a Weak Signal to Evoke Continuous Electrical Spikes in a Single Neuron*. In: Proceedings of the National Conference on Device, Intelligent System, Communication & Networking, 1-2 August, 2008, Asansol, Excel India Publishers, pp135-138.
67. **Ghosh, S.** (2006) *From Perception of Sound to Music Learning*. In: Proceedings from the International Workshop on Analysis, Synthesis & Perception of Music Signals, C.V. Raman Centre for Physics & Music, Jadavpur University.
68. Banerjee, J., Manna, S. Verma, M.K. & **Ghosh, S.** (2006). *Self-Organized Criticality in Ion Channels*. In: National Conference on Nonlinear Systems & Dynamics, Chennai.
69. **Ghosh, S.** (2005) *How Brain Learns Music*. In: Proceedings from the Frontiers of Research on Speech & Music, Bhubaneswar, pp 32-37.
70. **Ghosh, S.** (2004) *How Brain Learns Auditory Signals?* Proceedings from International Conference on Systemics, Cybernetics & Informatics, Hyderabad, pp 476-479.
71. Ghosh, P., Bose, D. & **Ghosh, S.** (2004) *Collective Behavior of Membrane Channels: Voltage-Clamp Studies on Gap Junctions*. In: **Function and Regulation of Cellular Systems: Experiments and Models**, eds. A. Deutsch, M.Falcke, J.Howard, W. Zimmermann, Birkhauser, Basel, pp 89-97.
72. **Ghosh, S.** (2003) *How we Learn Music*. In: Proceedings from the Frontiers of Research on Speech & Music, IIT Kanpur, pp 1-5.
73. **Ghosh, S.** (2001) *Electrophysiology of Passive Diffusion Channels*. In: **Biophysical Processes in Living Systems**. Ed. P. Pardha Saradhi. Oxford & IBH Publishing Co., New Delhi, Science Publishers, Inc., Enfield (NH),USA, Plymouth, UK, pp133-147.
74. **Ghosh, S.** (2001) *Collective Phenomena in Biology*. In: **Mathematics in Biology**. Ed. Anjali Mookerjee. Ashutosh Institute, Calcutta, pp 293-303

75. **Ghosh, S.** (2000) *Understanding Cognition of Musical Patterns: A Neuro-physiological Perspective*. In: Proceedings from the Fifth International Workshop on Recent Trends in Speech, Music and Allied Signal Processing. Sangeet Research Academy, Calcutta. pp 63-72.
76. **Ghosh, S.** (2001) *Computers, Brain & Music*. In: *Proceedings from the Sixth International Workshop on Recent Trends in Speech, Music and Allied Signal Processing*. Sangeet Research Academy, Calcutta. pp 136-142.

Collaborators:

1. Prof. Jonathan Ashmore, Deptt. of Physiology & Neuroscience, University College of London, Ear Institute, UK.
2. Prof. Amal K. Bera, Deptt. of Biotechnology, IIT Madras.
3. Prof. Manidipa Banerjee, School of Biosciences, IIT Delhi.
4. Prof. Mahendra K. Verma, Deptt. of Physics, IIT Kanpur.

Membership:

- Ex-Member of American Chemical Society.
- Life member of Indian Biophysical Society
- Ex-Member of New York Academy of Sciences.
- Member of CCRH, Ministry of Ayush, Govt. of India.
- Served as Member, Faculty/ Scientist Selection Committee, DRDO, NIMHANS & other Boards.

Extra-curricular Activities:

A performing artist in **Indian Classical Vocal Music**. Please visit the **YouTube Channel**.
https://www.youtube.com/channel/UCSGxOLSSC_MJyTrAjXGzjaA & website
<https://www.subhendughosh.com>