

Prof. KARMESHU

PRESENT POSITION

- **Distinguished Professor**
Department of Computer Science and Engineering
School of Engineering
Shiv Nadar University, Greater Noida, U. P
Also
- **Founding Professor (Honorary)**
NIIT University, Neemrana, Rajasthan.
- **Distinguished Research Professor (Honorary)**
The NorthCap University, Gurgaon, Haryana,
122017.

Mobile: +919560704874
+91-9968284874
Phone:(R): 011-43701250
011-27014874
E-mail: karmeshu@snu.edu.in,
karmeshu@gmail.com

Residential Address:
A-150, Deepali, Road No-42.
Pitampura Delhi-110034

RESEARCH INTERESTS

Mathematical Modelling and Computer Simulation:

Application of nonlinear and stochastic frameworks for analysis of multidisciplinary systems(ranging from physical, engineering, biological to social systems).

- Performance Modelling of Communication Networks.
- Computational Neuroscience and System Biology.
- Modelling of Socio-Technical Systems.
- Computational Finance.

Research articles have been published not only in ‘Science Citation Index’ (SCI) journals but also in ‘Social Science Citation Index’ (SSCI) journals.

ACADEMIC HONOURS

- Recipient of *Shanti Swarup Bhatnagar Award* in *Mathematical Science* for the year 1993.

Citation:

“Dr. Karmeshu has developed mathematical models for the dynamics of social and technical systems with special emphasis on their stochastic evolution. His contribution towards the understanding of the unity of structure and dynamics of diverse apparently unconnected systems is highly significant.”

- *Fellow National Academy of Sciences.*
- *Fellow Institute of Communication Engineers & Information Technologists (ICEIT).*
- Recipient of *C. M. Jacob Medal* for the year 1990, *Systems Society of India.*

Citation:

“Prof. Karmeshu’s contribution to Systems Research is to develop mathematical models of dynamical systems with special emphasis on stochastic evolution and their applications to socio-economic and technical systems such as traffic systems, population growth and dynamics of urbanization, competing social groups, technological substitution and water resource systems.”

- Membership of International Task Group

Full member of **CODATA** (Committee on Data for Science and Technology for International Council for Science, Paris, France) Task Group on Comparative Mathematical Methodologies for data handling and Knowledge Extraction (1999-2000).

- **Elected President of Mathematics Section of 85th session** of Indian Science Congress Association 1997-1998. **Title of the Presidential Address:** Mathematical Models of Some Social and Technical systems.
- Recipient of *Distinguished Service Award* of *Vijnana Parishad of India* on May 2013.
- Recipient of *SSI Lifetime Achievement Award* of *Systems Society of India (SSI)* on December, 2015.
- Recipient of *Fellowship of Indian Academy for Mathematical Modeling and Simulation (IAMMS) 2015* for his outstanding contribution in Mathematical Modeling and Simulation.

**ACADEMIC CUM
ADMINISTRATIVE
APPOINTMENTS**

- **Professor**, School of Computer and Systems Sciences (SC&SS), Jawaharlal Nehru University, New Delhi, India. **April 1986 to June 2017.**
- **Dean**, School of Computer and Systems Sciences (SC&SS), Jawaharlal Nehru University, New Delhi, India. **Sept. 1987 to Sept. 1989, July 2003 to July 2005, July 2011 to July 2013**
- **Dean**, School of Computational and Integrative Sciences (SCIS), Jawaharlal Nehru University, New Delhi, India. **May 7, 2012 to Sept. 4, 2013.**
- **Coordinator**, Mathematical & Computational Empowerment Cell (University Level Programme), Jawaharlal Nehru University, (**January 01, 2013 to August 28, 2014**).
- **Senior Professor**, Indian Agricultural Statistics Research Institute, New Delhi, India. **March 1985 to April 1986.**
- **Scientist E**, National Institute of Science, Technology and Development Studies, (CSIR), New Delhi, India. **July 1984 to March 1985.**
- **Visiting Professor**, Dept. of Systems, Universidad, Autonoma Metropolitana, Mexico, D.F.. **April 1983 to June 1984.**
- **Visiting Assistant Professor**, Dept. of Systems Design, University of Waterloo, Canada. **Sept. 1980 to Aug. 1982.**
- **Visiting Assistant Professor** Dept. of Physics, University of Waterloo, Canada. **Nov. 1979 to Aug. 1980.**

- **Lecturer in Physics**, Ramjas College, University of Delhi, Delhi-110007, India. **Oct. 1977 to Aug. 1979.**
- **Visiting Scientist**, Theoretical Physics, Stuttgart, University Germany. **June 1976 to Sept. 1977.**
- **Lecturer in Physics** Ramjas College, University of Delhi, Delhi-110007, India. **Aug. 1971 to May 1976.**

EDUCATION

University of Delhi, New Delhi, India.

Ph.D., 1975

- Thesis Topic: *Generalized Langevin Equation and Random Walk Analysis for Diffusion of Brownian Particles.*

M.Sc. (Physics), 1970

- *First Division*
- Recipient of a *National Fellowship* during M.Sc..

B.Sc.-Physics(Hons.), 1968

- Subsidiary Subjects *Mathematics and Mathematical Statistics.*
- First division, **Gold Medal** (first rank)
- University topper among all Honours Courses.

CONSULTING EXPERIENCE

- **Consultant in Centre of Prospective Investigations (1983 to 1984)**, *Fundacion Javier Barros Sierra, A.C. Mexico*, (in area of Mathematical models for Demographic Studies of Urbanization in Mexico).
- **Advisor in Systems Research Group (1983 to 1985)**, *Institute of Engineering, National University of Mexico, Mexico* (in area of Mathematical Modeling and Stochastic Processes).
- **Consultant to NISTADS (CSIR), New Delhi (1987 to 1989)** on *Mathematical Modeling relating to research & development management, Scientometrics, Diffusion of Innovations.*

RECOGNITION OF WORK DONE

- **Member**, *Shanti Swarup Bhatnagar Award Committee* in Mathematical Sciences (several times).
- **Vice President**, *The Mathematics Consortium, TIMC* - (To provide federal structure to societies, associations and similar forums in Mathematics in India; To promote Mathematics, Statistics and related sciences in all branches listed in AMS Classification etc.)

- **President**, Indian Society for Mathematical Modeling and Computer Simulation (ISMMAACS), HQ: IIT Kanpur.
- **Chairman**, *Committee for Research in Mathematical Sciences*, (CSIR), Delhi.
- **Chairman**, DOEACC course Curricula on Bioinformatics.
- Visitor's Nominee, *New NIT's* in Computer Science and Engineering.
- **Member**, *Standing Committee* on National Mission on education-ICT, MHRD.
- **Member**, *FIST Programme*, DST (Mathematical Sciences area).
- **Member**, *Governing Board of INFLIBNET Centre*, Gandhi Nagar, Gujarat.
- **Member** (Past), *UGC-CAS Review Committee*, Department of Computer Science and Automation, IISc Bangalore.
- **Member** (Past), *Quinquennial Review Team* on Indian Agricultural Statistics Research Institute (ICAR), New Delhi.
- **Member** (Past), *Technical Advisory Committee*, Biological Science Division, Indian Statistical Institute, Kolkata.
- **Member** (Past), *Senate*, Indian Institute Technology, Roorkee.
- **Member** (Past), *Expert group on Information Technology* under New Millennium Indian Technology Leadership (NMITLI) CSIR.
- **Chairman** (Past), *Governing Body*, Bhaskaracharya College of Applied Sciences, University of Delhi.
- **Member** (Past), *Central Connectivity and Monitoring Committee*, UGC Infonet Connectivity Programme.
- **Chairman** (Honorary) (Past), *DOEACC Examination Board*, Ministry of Information Technology Government of India, New Delhi.
- **Member**, *Executive Committee*, Systems Society of India.
- **Membership of Editorial Boards:** (Past)
 1. Stochastic Hydrology and Hydraulics: Springer International (1990-93)
 2. Journal of Scientific & Industrial Research, CSIR (1990-2001).
- **Guest Editor** (Past), *Journal of Scientific & Industrial Research (CSIR)*, two special issues on mathematical modelling: (Golden Jubilee Year)

- **Chairman** (Past), *Course Curriculum Development in Bioinformatics* for O, A, B and C levels, DOEACC, Dept. of Information Technology, Ministry of Communication and Information Technology, Govt. of India.

MEMBERSHIP OF PROFESSIONAL BODIES

- *Indian Science Congress Association.*
- *Systems Society of India.*
- *Society of Scientific Values* (also served as honorary treasurer for one term).
- *Indian Mathematical Society.*
- *System Dynamics Society of India.*
- *Association for Advancement of fault tolerant Autonomous Systems.*
- *Society of Mathematical Sciences, Delhi.*
- *Institute of Communication Engineers & Information Technologists (ICEIT), Delhi.*
- *Indian Society of Mathematical Modelling and Simulation.*

MEMBERSHIP OF COMMITTEES

Served as a member (once or more than once) on the following committees:

1. **Steering Board Member**, *Indo-French Centre for Applied Mathematics, IF-CAM.*
2. **Member**, *Standing Committee for Emeritus and One Time Grant Research Committee, CSIR.*
3. **Member**, *UGC Committee for Special Assistance Programme, Department of Statistics, MDU, Rohtak.*
4. *Expert examiner* for Ph.D. thesis from TIFR (Mumbai), I.I.Sc. (Bangalore), I.I.T. (Madras), IIT (Delhi), IIT (Kanpur), IIT (Roorkee), Panjab University, University of Delhi, University of Calcutta, Jadavpur University.
5. *Selection Board RAC (DRDO), ASRB (ICAR), ICMR, CSIR, UPSC, AICTE.*
6. **Member**, *Expert Committee, INSPIRE Fellowship 2012, Northern Region.*
7. **Member**, *Academic Advisory Council, ITM University, Gurgaon.*
8. **Member**, *Academic Council, NIIT University, Neemrana, Rajasthan.*
9. **Member**, *Board of Studies, South Asian University, New Delhi.*
10. **Member**, *Faculty of Technology, Delhi University, Delhi.*

11. *Fellowship Scrutiny Committee* of National Academy of Sciences in Physical Sciences.
12. **Member**, *Project Appraisal Board*, National Institute of Science, Technology and Development Studies (NISTADS), CSIR.
13. **Member**, *Doctoral Committee*, School of computer and Information Sciences, IGNOU, New Delhi.
14. **Member**, *Standing Syllabus Committee*, DOEACC.
15. **Member**, *Steering Board* for the Indo-French Centre for Applied Mathematics.
16. **Member**, *Senate*, India Institute of Technology, Roorkee and Indian Institute of Technology, Delhi.
17. **Member**, Task Force, DOEACC, Ministry of Communication and Information Technology.
18. **Member**, *Committee for evolving a vision document* for future academic expansion of JNU.
19. **Member**, *Research Area Committee* on Professional Ph.D. Programme, IGNOU.
20. **Member**, *UGC Expert Committee* (University of Potential Excellence) for University of Mumbai.
21. **Member**, *UGC Expert Committee to review 10th plan and access 11th plan requirements* of
 - Pune University.
 - Central University of Hyderabad.
22. **Member**, *National Assessment and Accreditation Council (NAAC) Committee*
 - IIIT Bangalore.
 - IIIT Hyderabad.
 - Central University Pondichery.
 - Dayal Bagh Educational Institute, Agra.
23. **Member Representative** (Past), *Distance Education Council (IGNOU)* for approval of distance education programmes of several institutions.
24. **Member** (Past), *Expert panel for selection of faculty* at I.I.Sc (Bangalore), I.I.T. (Delhi), I.I.T. (Roorkee), I.I.T. (Madras), I.I.T. (Hyderabad), I.I.T. (Rajasthan), Indira Gandhi National Open University, Banaras Hindu University, University of Calcutta, University of Delhi, Jamia Milia Islamia (Delhi), GSIP University (Delhi), Punjab University (Chandigarh).
25. **Member** (Past), *Expert committee to establish dual degree program B.Tech (Electrical Engineering) and M.Tech (Information and Communication Technology)*, I.I.T., Delhi.

26. **Member** (Past), *UGC Committee, Special Assistance Programme Phase II Department of Applied Mathematics*, University of Calcutta, Kolkata.
27. **Member** (Past), *Curriculum Development Committee for Mathematics*, Central University of Orissa, Koraput.
28. **Member** (Past), *Curriculum Development Committee for Computer Science*, Central University of Bihar, Patna.
29. **Member** (Past), **Expert** *Committee for establishing M.Tech in Telecommunication, Technology and Management*, Bharati School of Telecom Policy and Management, I.I.T. Delhi.
30. **Member** (Past), *Curriculum Development committee in Mathematics*, University Grants Commission, New Delhi.
31. **Member** (Past), *Personality Test Board of Union Public Service Commission*, Govt. Of India for interviewing candidates who qualify Indian Civil Services (Main) Examination.
32. **Member** (Past), *Board of Studies*, School of computer and Information Sciences, IGNOU, New Delhi.
33. **Member** (Past), *Research Council, National Institute of Science, Technology and Development Studies (CSIR)*, New Delhi.
34. **Member** (Past), *Subject panel on Engineering and Technology*, University Grants Commission, New Delhi.
35. **Member** (Past), *Standing Advisory Committee for Applied Systems Research Program*, I.I.T. Delhi.
36. **Member** (Past), *Standing Advisory Committee for Development of Management Studies*, I.I.T. Delhi.
37. **Member** (Past), *Technical Advisory Committee (Physics and Applied Mathematics Unit)*, I.S.I. Calcutta.
38. **Member** (Past), *Advisory Committee, Institute of Information and Communication*, South Campus, University of Delhi, Delhi.
39. **Member** (Past), *Advisory Committee meeting SAP/UGC*, of several university.
40. **Member** (Past), *Computer Centre Advisory Committee*, IIT, Roorkee.

RESEARCH
PAPERS IN SCI,
SSCI AND OTHER
REFEREED
JOURNALS /
BOOKS

[2018]

- [1] S. Kumar and **Karmeshu**, “*Characterizing ISI and sub-threshold membrane potential distributions: Ensemble of IF neurons with random noise intensity*”, Biosystems (to appear).

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- [2] R. K. Singh, **Karmeshu**, S. Kumar, “*A Novel Approximation for K Distribution: Closed-Form BER Using DPSK Modulation in Free-Space Optical Communication*”, *IEEE Transactions on Photonics*, Vol. 9, 2017.
- [3] S. Bhatnagar, S. Patel and **Karmeshu**, “*A stochastic approximation approach to active queue management*”, *Telecommunication Systems*, pp. 1-16, 2017.
- [4] S. Patel, K. Sen and **Karmeshu**, “*Performance analysis of AQM scheme using factorial design framework*”, *IEEE Systems Journal*, Vol. 99 pp. 1-9, 2017.

[2016]

- [5] **Karmeshu**, S. Patel and S. Bhatnagar, “*Adaptive mean queue size and its rate of change: Queue management with random dropping*”, *Telecommunication Systems*, pp. 1-15, 2016
- [6] R. Gupta, M. Reneaux and **Karmeshu**, “*Role of heterogeneous macromolecular crowding and geometrical irregularity at central excitatory synapses in shaping synaptic transmission*”, *PLoS ONE*, Vol. 11(12) e0167505, 2016.
- [7] D. Senapati and **Karmeshu**, “*Generation of cubic power-law for high frequency intra-day returns: Maximum Tsallis entropy framework*”, *Digital Signal Processing*, Vol. 48 pp. 276-284, 2016.

[2015]

- [8] A. Gupta and **Karmeshu**, “*Study of compound generalized Nakagami- Γ generalized inverse Gaussian distribution and related densities: application to ultrasound imaging*”, *Computational Statistics*, Vol. 30 pp. 81-96, no. 1, 2015.
- [9] A. Gupta and **Karmeshu**, “*Efficacy of Pearson distributions for characterization of gray levels in clinical ultrasound kidney images*”, *Signal, Image and Video Processing*, Vol. 9 pp. 1317-1334, no. 6, 2015.
- [10] M. Reneaux, R. Gupta and **Karmeshu**, “*Stochastic mesocortical dynamics and robustness of working memory during delay-period*, *PLoS ONE*, 10(12): e0144378, 2015.
- [11] A. K. Singh, H. P. Singh and **Karmeshu**, “*Analysis of finite buffer queue: Maximum entropy probability distribution with shifted fractional Geometric and Arithmetic means*”, *IEEE Communications Letters*, Vol. 19, no. 2,

2015.

- [12] **Karmeshu**, Shachi Sharma and Sanjeev Kumar, “*Generation of power-law: Maximum entropy framework and Superstatistics*”, *Advances in Intelligent Systems and Computing*, Vol. 391 pp. 45-59, *Man-Machine Interactions 4, 4th International Conference on Man-Machine Interactions, ICMMI 2015, POLAND 2015*.

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- [13] A. K. Singh, **Karmeshu**, “*Power Law Behavior of Queue Size: Maximum Entropy Principle with Shifted Geometric Mean Constraint*”, *IEEE Communications Letters*, Vol. 18, no. 8, 2014.

- [14] Vineet Khandelwal and **Karmeshu**, “*A New Approximation for Average Symbol Error Probability over Log-normal Channels*”, *IEEE Wireless Communications Letters*, Vol. 3 pp. 58-61, 2014.

- [15] Singh A. K. and **Karmeshu**, “*Power Law Behavior of Queue Length: Maximum Entropy Principle with Shifted Geometric Constraints*”, *IEEE Communication Letters*, Vol. 18, Issue: 8, pp. 1335-1338.

- [16] **Karmeshu** and S. K. Sharma, “*Ensemble of LIF neurons with random membrane decay constant: Emergence of Power Law behavior in ISI distribution*”, *IEEE Transaction on NanoBiosciences*, Vol. 13, no. 3, pp. 308-314, 2014.

- [17] Abhinav Gupta and **Karmeshu**, “*Study of Compound Generalized Nakagami-Generalized inverse Gaussian Distribution and Related Densities: application in ultrasound imaging*”, *Computational Statistics, Springer*, appeared online August 21, 2014.

- [18] Vineet Khandelwal and **Karmeshu**, “*Performance Analysis of Composite Fading Channel based on Point Estimate Method*”, *Journal Wireless Personal Communications, Springer*, Vol. 79, no. 2, pp. 953-968, 2014.

[2013]

- [19] S. K. Sharma and **Karmeshu**, “*Neuronal Model With Distributed Delay: Emergence of Unimodal and Bimodal ISI Distributions*”, *IEEE Transactions on Nanobioscience*, Vol. 12, No. 1, p. 1-12.

- [20] **Karmeshu** and Vineet Khandelwal, “*On the Applicability of Average Channel Capacity in Log-Normal Fading Environment*”, *Wireless Personal Commu-*

nications, Springer, Vol. 68, Issue 4, p. 1393-1402.

- [21] Abhinav Gupta and **Karmeshu**, “*Efficacy of Pearson Distribution for Characterization of Gray Levels in Clinical Ultrasound Kidney Images*”, *Signal, Image and Video Processing*, Springer appeared online December 11, 2013.

[2012]

- [22] **Karmeshu**, Raghu Raman and Prema Nedungadi, “*Modelling diffusion of a Personalized Learning framework*”, *Educational Technology Research & Development*, Springer, Vol. 60, No. 4, p. 585-600.

[2011]

- [23] S. K. Sharma and **Karmeshu**, “*Power Law Behavior in IF Model With Random Excitatory and Inhibitory Rates*”, *IEEE Transactions on Nanobioscience*, Vol. 10, No. 3, p. 172-176.

- [24] **Karmeshu**, Varun Gupta and K. V. Kadambari, “*Neuronal model with distributed delay: analysis and simulation study for gamma distribution memory kernel*”, *Biological Cybernetics*, Vol. 104 p. 369-383.

- [25] **Karmeshu**, S. Bhatnagar and V. Mishra, “*An Optimized SDE Model for Slotted Aloha*, *IEEE Transactions On Communications*, Vol. 59, No. 6, p. 1502-1508.

- [26] **Karmeshu**, Prashant Baliga, Janat Shah and Sanjeev Swami, “*Concentrated Promotional Efforts and Product Diffusion: A Normative Analysis*”, *Technology Operation Management*, Vol. 2, Issue 2, p. 90-101.

- [27] Abhinav Gupta and **Karmeshu**, “*Statistical Characterisation of Speckle in Clinical Echocardiographic Images with Pearson Family of Distributions*”, *Defence Science Journal*, Vol. 61, No. 5, p. 473-478.

- [28] S. Bhatnagar, **Karmeshu**, “*Monte-Carlo estimation of time-dependent statistical Characteristics of random dynamical systems*”, *Applied Mathematical Modelling*, Elsevier, Vol. 35, p. 3063–3079.

- [29] **Karmeshu** and Vineet Khandelwal, “*MGF and high order moment of channel capacity in log-normal fading environment*”, *Proceedings of the 1st International Conference on Wireless Technologies for Humanitarian Relief*, ACM, p. 99-106.

[2009]

- [30] S. Sharma and **Karmeshu**, “*Power Law Characteristics and Loss Probability: Finite Buffer Queueing Systems*”, *IEEE Communications Letters*, Vol. 13, Issue 12, p. 971-973.

- [31] S. Bhatnagar, **Karmeshu** and V. Mishra, “*Optimal parameter trajectory estimation in parameterized SDEs: An algorithmic procedure*”, *ACM Transactions on Modeling and Computer Simulation(TOMACS)*, Vol. 19, No. 2,

Article No. 8, p. 8:1-8:27.

[2008]

- [32] S. Sharma and **Karmeshu**, “*Bimodal packet distribution in loss systems using maximum Tsallis entropy principle*”, *IEEE Trans. Comm.*, Vol. 56, Issue 9, p. 1530-1535.
- [33] **Karmeshu** and D Goswami, “*Transient Bimodality and Catastrophic Jumps in Innovation Diffusion*”, *IEEE SMC-A*, Vol. 38, No.3, p. 644-654.

[2007]

- [34] **Karmeshu** and P. Sharma, “*Truncating the hierarchy of moment equations based on Point Distribution Application to Innovation Diffusion*”, *Mathematical and Computer Modelling*, Vol. 45, Issue 3-4, p. 233-240.
- [35] R. Agrawal and **Karmeshu**, “*Ultrasonic back scattering in tissue: characterization through Nakagami-generalized inverse Gaussian distribution*”, *Comput. Biol. Med.*, Vol. 37, Issue 2, p. 166-172.

[2006]

- [36] **Karmeshu** and R. Agrawal, “*Study of ultrasonic echo envelope based on Nakagami-Inverse Gaussian distribution*”, *Ultrasound Med. Biol.*, Vol. 32, Issue 3, p. 371-376.
- [37] **Karmeshu** and S. Sharma, “*Power Law and Tsallis entropy : Network Traffic and Applications in Chaos Nonlinearity and Complexity (Studies in Fuzziness and Soft Computing)*”, ed. A. Sengupta, *Springer Verlag*, Vol. 206, p. 162.
- [38] **Karmeshu** and S. Sharma, “*q-Exponential product from solution of packet distribution in queuing networks: maximization of Tsallis entropy*”, *IEEE Comm. Letters*, Vol. 10, Issue 8, p. 585-587.
- [39] N.R Pal, A. Sharma, S. Sanadhya and **Karmeshu**, “*On identifying marker genes from gene expression data in a neural framework through online feature analysis*”, *Intl. Journal of Intelligent Systems*, Vol. 21, Issue 4, p. 453-467.
- [40] **Karmeshu** and S. Sharma, “*Queue length distribution in network packet traffic: Tsallis entropy maximization with fractional moments*”, *IEEE Comm. Letters*, Vol. 10, Issue 1, p. 34-36.
- [41] **Karmeshu** and R. Agrawal, “*On efficacy of Rayleigh-inverse Gaussian distribution over K-distribution for wireless fading channels*”, *Wireless Communications & Mobile Computing (WCMC)*, Vol. 7, Issue 1, p. 1-7.

[2004]

[42] **Karmeshu** and A. Krishnamachari, “*Sequence variability and long-range dependence in DNA: An information theoretic perspective in Neural Information Processing*”, (Elevanth International Conference), ICONIP2004, *Lecture Notes in Computer Science*, Springer, Vol. 3316, p. 1354-1361.

[43] D. Goswami and **Karmeshu**, “*Study of population heterogeneity in innovation diffusion model: Estimation based on simulated Annealing*”, *Technological Forecasting and Social Change*, Vol. 71, Issue 7, p. 705-722.

[44] **Karmeshu** and Praveen Sharma, “*Stochastic evolution of innovation diffusion in heterogeneous population: emergence of multimodel life cycle patterns, in Operational Research and its application*”, Ed. M.R. Rao and M.C. Puri, *Allied Publishers*.

[45] A. Krishnamachari, V. Mandal and **Karmeshu**, “*Study of DNA binding sites using the Renyi parametric entropy measure*”, *Journal of Theoretical Biology*, Vol. 227, Issue 3, p. 429-436.

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[46] **Karmeshu** and N. R. Pal, “*Uncertainty, entropy and Maximum entropy principle—an overview in Entropy Measures, Maximum Entropy Principle and emerging applications*”, Ed . **Karmeshu**, p. 1, Springer.

[47] **Karmeshu** and V. P. Jain, “*Nonlinear models of social systems*”, *Economic and Political Weekly*, Vol. 38, No. 35, p. 3678-3685.

[48] D. Goswami and **Karmeshu**, “*Capturing saddle phenomenon, estimation and precest – A case study of Indian TV Industry*”, *J.Sci.Indus. Res. (CSIR)*, 62, No. 5.

[2002]

[49] R. C. Prasad, **Karmeshu** and K. K. Bharadwaj, “*Stochastic modelling of heat exchanger response to data uncertainties*”, *Applied Mathematical Modelling*, Vol. 26, Issue 6, p. 715-726.

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[50] **Karmeshu** and D. Goswami, “*Stochastic evolution of innovation diffusion in heterogeneous groups: Study of life cycle patterns*”, *IMA Journal of Mathematics & Management*, Vol. 12, Issue 2, p. 107-126.

[51] A. Schamorst, **Karmeshu**, “*Dynamics of economic and technological search process in and W. Ebeling complex adaptive landscapes*”, *Advances in Complex Systems*, Vol. 4, No. 1, p. 71-88.

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[1999]

- [53] W. Ebeling, A. Schamhorst, M. A. J. Monotano and **Karmeshu**, “*Evolution and Innovations dynamik als Suchproze in Komplexen adaptrien Land Schaften in Komplexe Systeme and Nichtlin are Dynamik in Natur Gesellschaft*”, ed. Klaus Mainzer, Springer, p. 446.

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- [55] W. Ebeling, M. A. J. Montano and **Karmeshu**, “*Dynamics of innovation in Technology and Science based on individual development in Self organization of complex structures*”, *Gordon & Breach Science Publishers*.
- [56] **Karmeshu** and V. P. Jain, “*Modelling innovation Diffusion in Innovative Behaviour in Space and Time*”, Eds. C.S.Bertuglia, S. Lombardo and P. Nijkamp, Springer Verlag, p. 64.

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- [58] **Karmeshu** and Henri Schurz, “*Moment Evolution of the outflow rate from nonlinear conceptual reservoirs in Surface Water Hydrology*”, Ed. V. P. Singh, *Kulwer Academic Publishers, London* 403.

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- [59] **Karmeshu** and Henri Schurz, “*Stochastic stability of structures under active control with distributed time delays*”, *Appl. Of Statistics and Probability*, in Civil Engg. Reliability and Risk Analysis, Balkema, Rotterdam 1111.
- [60] **Karmeshu** and Henri Schurz, “*Effects of distributed delays on the stability of structures under seismic excitation and multiplicative noise*”, *Sadhana*(Special issue Academy Proceedings in Engg.), 20, p. 451.
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- [66] M. P. Jaiswal, C.L. Sharma and **Karmeshu**, “*Stochastic analysis of nonlinear machine interference model*”, *Math & Computer in Simulation*, 34, 451.

[1991]

- [67] **Karmeshu**, V. B. Lal and D. N. Rao, “*Modelling Arms Race with Stock Adjustment in Models of Arms Race*”, Ed. J. Bandyopadhyaya, *International relations and Strategic Studies*, Jadavpur University, India.

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- [68] **Karmeshu**, “*Queueing model with threshold phenomena—with special reference to machine interference problems*”, *Sadhana*, Special issue: Modelling and Control of Stochastic Systems, *Acad. Proc. In Engg.* 15, 319.
- [69] **Karmeshu**, V. P. Jain and A. K. Mahajan, “*A dynamic model of domestic political conflict process*”, *J. Conflict Resolution*, 34, 252.

[1989]

- [70] Y. Takeuchi and **Karmeshu**, “*A dynamic model of three competing social groups*”, *Int. J. of System Sci.*, 20, 2125.
- [71] D. N. Rao, **Karmeshu** and V.P. Jain, “*Dynamics of Urbanization—Empirical validation of replacement hypothesis*”, *Env. Planning*, 6B, 289.

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BOOKS

- **Karmeshu** (Ed.), “*Entropy Measures, Maximum Entropy Principle and Emerging Applications*”, *Studies in Fuzziness and Soft Computing* Vol.119, 2003, Springer-Verlag.
- **Karmeshu** (Guest editor), “*Journal of Scientific & Industrial Research (CSIR)*” two special issues on *mathematical modelling*:, (Golden Jubilee Year).
 - (i) “*Mathematical Modelling of Innovation Diffusion and Technical Change*”, *Journal of Scientific & Industrial Research*, 51(3), 1992.
 - (ii) “*Mathematical Modelling in Science and Technology Studies*”, *Journal of Scientific & Industrial Research*, 51(8 & 9), 1992.

ACADEMICS VISITS ABROAD (SINCE 1995)

- Three invited visits to Weierstrass Institute for Applied Analysis and Stochastic, Berlin, Germany (joint research work)
- Visit to University of Texas, Austin to carry out joint research work
- Invited by School of information Science and Engineering, Lanzhou University, People’s Republic of China.
- Delivered seminars in various institutes/universities of Europe, Canada and U.S.A.

These seminars were in the broad area of stochastic modelling dealing with Innovation Diffusion, Dissemination of information in social Groups, Conflict processes, Models of Urbanization, Non linear queueing systems, Water storage in conceptual reservoirs, Critical behaviour in slotted Aloha systems, Stability of civil engineering Structures under active control. Modelling Social Systems, Nonlinear frameworks, LRD in BISDN, Computational Probability and Monte Carlo Methods; Entropy and MEP-An information theoretic framework, Software industry in India, DNA sequence variability and power laws.

Some universities where seminars were delivered:

- University of Stuttgart (Germany).
- University of Kaiserslautern (Germany).
- University of Bielefeld (Germany).
- University of Bonn (Germany).
- Max–Planck Gesellschaft–University of Potsdam (Germany).

- Potsdam Institute for Climate Impact Research, Kornard-Zuse Zentrum Berlin (Germany).
- Humboldt University, (Germany).
- University of Leiden (The Netherlands).
- Tinbergen Institute, Amsterdam, (The Netherlands).
- University of Twente, (The Netherlands).
- Universite Libre de Bruxells, (Belgium).
- University of Limburg, (Belgium).
- University of Berne, (Switzerland).
- University of Waterloo (Canada).
- University of Ottawa (Canada).
- University of New Brunswick (Canada).
- Texas A & M University (U.S.A.).
- Lanzhou University (China).
- University of Washington, (Seattle, U.S.A.) (Invited for discussion at Department of Physiology and Biophysics).
- University of Pennsylvania, (Philadelphia, U.S.A.) (Invited for discussion at Wharton School).
- Drexel University, (Philadelphia, U.S.A.) (Invited for discussion at ECE Department).

**SOME MEMORIAL
/ ENDOWMENT
LECTURES
DELIVERED**

- Invited Lecture on “*Statistical Characterization of Gray Levels in Ultrasound Imaging*,” at *CSIR Sponsored Symposium on “Image Processing and Pattern Recognition”* at *South Asian University*, New Delhi, Nov. 1, 2013.
- Invited panelist, “*Nonlinear Modeling of Social Systems, Indo-French Tech Summit Round Table on Complex Systems*” on October 24, 2013, New Delhi.
- Invited Lecture on “*Stochastic Modelling and Simulation of Neuronal Dynamics: Characterization of Spiking Patterns and Emergence of Power Law*” in track, “*Bioinformatics and Computational Biology*”, at *Amrita Bio Quest 2013*, Amrita Vishwa Vidyapeetham University, Coimbatore July 2013.
- Invited Lecture on “*Stochastic Modeling of Spiking Neuron and Emergent Power Law Behaviour*,” at *International Conference on “Mathematical Modeling and Numerical Simulation”* at *Department of Applied Mathematics, School of Physical Sciences*, Babasaheb Bhimrao Ambedkar University, Lucknow, June 2013.
- Delivered several “*Inspire*” lectures at various institute.
- Invited Lecture on “*Tsallis Entropy, Maximum Entropy Principle: Application in Broadband Networks*” at *16th Annual Conference of VPI*, Agra, May 2013.
- Invited Lecture on “*Mathematical Models of Social System*” at Narsee Monjee Institute of Management Studies, Mumbai, in the Research Symposium on the University Day January 2013.

- Invited Lecture at *International Conference on Statistics and Informatics in Agricultural Research*, New Delhi, Dec. 2012
- Invited Lecture on “*Critical Phenomenon in Social System Modelling*” at *Director’s Conclave on Professional Education in India: The Quality Paradigm*, Faculty of Management Studies, Banaras Hindu University, April 2011.
- J. N. Kapur Memorial Lecture on “*Entropy Measures and Maximum Entropy Principle*”, at *National Conference on Theoretical Biology and Biomathematics (NCTBB 2010)*, Jadavpur University, Kolkata Dec. 2010.
- Invited Lecture on “*Information Theory and Applications*”, *Distinguished Seminar Series, NSIT-IIITD*, New Delhi, Sept. 2010.
- *Platinum Jubilee Award Lecture in the section of Information & Communication Science and Technology* (including computer science) on “*Performance Modelling of Broadband Networks*”, Indian Science Congress NEHU, Shillong, January 2009.
- Invited Lecture on “*Modeling Biological Systems: Some Computational Approach*”, *Center for Interdisciplinary Research in Basic Sciences*, Jamia Millia Islamia, March 2009.
- Invited Lecture “*Continuous time Finance Modeling*”, Management Development Institute, Gurgaon, Dec. 2008.
- *National Technology Day Lecture* on “*Modelling Diffusion of Innovation*” at National Institute of Science Communication and Information Research (CSIR), New Delhi, 2003.
- *Foundation Day Lecture* on “*System Modelling: Role of Nonlinearity and Stochasticity*” at the Institute for Systems Studies and Analysis (DRDO), New Delhi, 2003.
- *P. L. Bhatnagar Memorial Lecture* at the Diamond Jubilee Session of the Indian Mathematical Society, Pune, 1994.
- Golden Jubilee Commemoration Lecture for 1993 (Calcutta Mathematical Society), 1994.
- Our work on “*Stochastic evolution of non linear model of diffusion of information and competing social groups*” form the subject matter of sections 10.5 and 10.6 and a paragraph of 10.7 of the book entitled *Stochastic Models of Social Processes* by D. J. Bartholomew (3rd edition), Wiley 1982.
- Our work on “*Diffusion of information in a random environment*” and “*Stochastic evolution of non-linear model of diffusion of information*” has been quoted in the book *Innovation Diffusion Models is of New Product Acceptance* edited by Vijay

CITATIONS TO
WORK AS LISTED
IN STANDARD
BOOKS

Mahajan and Yoram Wind., Ballinger Publishing Company, 1986 including extensive discussion on pages 172 and 173.

- Paper on “*Population growth of cities-a stochastic model*” has been widely referred to in the book *Interaction, Evolution and Chaos in Space* by P. Nijkamp and A. Reggiani, Springer-Verlag. (1991).
- Papers on “*Population growth of cities-a stochastic model*” and “*Non-linear model of diffusion of information*” have been cited in *Urban systems: Contemporary approaches to modelling* edited by C.S. Bertuglia et al., Crom Helm (1987).
- Paper on “*Diffusion approximation of machine interface model*” has been extensively quoted and forms a section in the book *Applied Stochastic Models and control in management* by C.S.Tapiero, North Holland (1988).
- Paper “*Compartment model with stochastic parameter*” forms the basis of a section in *Compartmental Analysis in Biology and Medicine* by J. A. Jacques, second edition, Michigan University Press (1983).
- P.E. Kloedon and E. Platen in their book on “*Numerical solution of stochastic differential equations*”, Springer-Verlag (1992), carry extensive discussion on our model *Nature of outputs from the conceptual reservoirs*.
- Work on “*Modelling innovation diffusion with distributed time lag*” has been cited at several places in the book *Growth and diffusion phenomena* by R. B. Banks, Springer-Verlag (1994).
- Our work on “*Rayleigh-Inverse Gaussian Distribution for Wireless Fading Channel*” has been cited at several places in *Fading and Shadowing in Wireless Systems* by P. M. Shankar, Spirnger, 2012.

INVITED PAPERS /
RESEARCH
SEMINARS
PRESENTED IN
CONFERENCE
AND WORKSHOPS
(SINCE 1998)

1. **Karmeshu**, “*Mathematical Modeling: A Trans-disciplinary Approach*,” in “Distinguished Professor Lecture Series,” January 16, 2016, Amity University, Haryana.
2. **Karmeshu**, “*Uncertainty Modeling, Maximum Entropy Principle: Power Law Behavior in Intra-day Returns*,” in “Modern Finance and Macroeconomics: A multidisciplinary Approach,” December 22, 2015 - January 02, 2016, International Center for Theoretical Sciences (ICTS), ICTS Campus, TIFR.
3. **Karmeshu**, “*Power of Mathematical Modeling: Some Societal Issues*,” in “Foundation Day Lecture,” December 22, 2015, Ramanujan College, University of Delhi, New Delhi.
4. **Karmeshu**, “*Computational Neuroscience: Power Law Behavior in Spiking Neurons*,” in “IEEE Workshop on Computational Intelligence: Theories, Applications, and Future Directions (IEEE WCI 2015),” December 14-17, 2015, .
5. **Karmeshu**, “*Power Law Distributions in Financial Markets*,” in “Econophys

- 2015: International Workshop on Econophysics and Sociophysics,” December, 2015, Jawaharlal Nehru University and University of Delhi, New Delhi.
6. **Karmeshu**, “*Role of Modelling in Stochastic Systems (Talk 1) and Uncertainty, Entropy and Maximum Entropy Principle: Emerging Applications (Talk 2)*,” in “International Workshop on Modelling and Control Of Dynamical Systems Under Uncertainty (IWUM 15),” 14-16 December, 2015, organized by South Asian University, New Delhi.
 7. **Karmeshu**, Invited lecture on “*Performance Modeling of Broadband Communication Network: Maximum Entropy Approach and Power Law Behavior*,” in “CSEE Speaker Series,” June 16, 2015, University of Missouri, Kansas City, USA.
 8. **Karmeshu**, Key note address on “*Generation of Power Law: Maximum Entropy Framework and Superstatistics*,” in “4th International Conference on Man-Machine Interactions, ICMMI,” October 6-9, 2015, Kocierz Pass, Poland.
 9. **Karmeshu**, Key note address on “*Stochastic Modeling of Spiking Neuronal Activity: Bimodality and Power-law Behavior in ISI distribution*,” in “DAAD Supported International Conference on Mathematical Modeling and Computer Simulation,” December 8-10, 2014, IIT Madras, Chennai.
 10. **Karmeshu**, Key note address on “*Mathematical Modelling: Interdisciplinary Framework*,” in “International Conference on Emerging Trends in Computational Applied Mathematics,” June 2-4, 2014, ITM University Gurgaon.
 11. **Karmeshu**, “*Administrative and Academic Structures: Some Issues*”, *Workshop on Evolving the Administrative and Academic Structures for Upcoming Educational Institutes / Universities of National Importance*, May 18, 2012, IIT Rajasthan.
 12. **Karmeshu**, “*Modelling Innovation Diffusion and Critical Phenomen*”, *Workshop on Systems Science: Complex Networks and Applications*, May 7–9, 2012, IIT Rajasthan.
 13. **Karmeshu**, “*Nonlinear Stochastic Modelling, Critical Phenomena and Entropy*”, *International Conference on Data Assimilation*, IISc Bangalore, July 2011.
 14. **Karmeshu**, “*Critical Phenomena in Social System Modeling*”, *International Conference on Practice and Research in Management*, Dayalbagh Educational Institute, Dayalbagh, Agra, Feb. 18–20, 2011.
 15. **Karmeshu**, “*Dynamic Modeling of Social Systems*”, Meeting on *The Economy as a Complex System II: Economic Dynamics*, Institute of Mathematical Sciences, Chennai, Dec. 27–29 , 2010.
 16. **Karmeshu**, “*Performance Evaluation of Broadband Networks Driven by LRD Traffic: Non-Extensive Entropy Framework*”, *National Conference on Operations Research*, University of Calcutta, Kolkata, Nov. 15, 2010.

17. **Karmeshu**, “*Modelling Diffusion of Innovation: Deterministic and Stochastic frameworks*”, 5th Data Analytics and Operations Research Workshop IIT Delhi, Organized by IBM Research Labs, Oct. 29–30, 2010.
18. **Karmeshu**, “*Stochasticity and Nonlinearity in Modelling of Social Systems*”, ASR–NSC 2009, Joint International Conference on Applied Systems Research and XXXIII National Systems Conference, Plenary Talk held at Dayalbagh Educational Institute, Dayalbagh, Agra, Nov. 27–29, 2009.
19. **Karmeshu**, “*Study of Effect of Long Range Dependence of Pocket Traffic in Communication Networks-Tsallis Entropy Framework*”, 9th Biennial National conference of Indian Society of Industrial and Applied Mathematics, BMAS, Agra, January 2009.
20. **Karmeshu**, “*Communication Network: Performance Issues*”, National Seminar on Recent Trends in Operational Research and its omputational Challenges, held at University of Kolkata, Nov. 17–18, 2009.
21. **Karmeshu**, “*Mathematical Modelling (Four Lectures)*”, National Workshop on Dynamical System: Analysis and Applications (NWCTP–DSAA–2009), organized by Department of Mathematics and DST–Centre for Interdisciplinary Mathematical Sciences (CIMS) Banaras Hindu University, Varanasi, Oct. 26–27, 2009.
22. **Karmeshu**, “*Integrated Broadband Networks and Quality of Services: Tsallis Entropy Framework*”, Invited Lecture, International Conference on recent trends in Mathematics and its Applications, Jamia Millia Islamia, March 30, 2009.
23. **Karmeshu**, “*Maximum Tsallis Entropy Approach for study of LRD in Network Traffic*”, (Three Lectures), IMI Workshop on Comm. Networks, IISc Bangalore, July 23–28, 2007.
24. **Karmeshu**, “*Stochastic Models Diffusion of innovation in homogeneous and Heterogeneous population*”, Intl. Conf. on Stochastic Processes and Applications, IISc Bangalore, July 16–21, 2007.
25. **Karmeshu**, “*Transient Bimodality in Innovation Diffusion: A New Phenomenon*”, Intl. Conf. on Mathematical Modelling and Computer Simulation, held at LNM Institute of Information Technology, Jaipur, December 2006.
26. **Karmeshu**, “*Mathematics Development–A perspective*”, Intl. Symp.–Soc. Industrial & Appl. Math., Delhi, Dec. 2005.
27. **Karmeshu**, “*Trends in Computational Biology*”(Key note address), National Conference on Bioinformatics, Thapar Institute of Engineering & Technology, Patiala, March 2005.
28. **Karmeshu**
 - (i) Modelling social systems Nonlinear framework
 - (ii) Long–range Dependence in BISDN
 - (iii) Computational probability and Monte Carlo methods

- (iv) Entropy and MEP—An information theoretic framework
- (v) Software industry in India
- (vi) DNA sequence variability and power laws

School of Information Science & Engg., Lanzhou University, China, Dec. 2004.

29. **Karmeshu**

- (i) Entropy measures and maximum entropy principle
- (ii) Capturing uncertainty in social systems (Six invited lectures)

Intl. Workshop on Mathematics & Physics of Complex Nonlinear Systems, I.I.T Kanpur, March 2004.

- 30. **Karmeshu**, “*Diffusion approximation framework for studying the offered load and performance characteristics of mobile network*”, Intl. Symp. *Inf. Tech: Emerging Trends*, I.I.I.T. Allahabad, Sept. 2003.
- 31. **Karmeshu** and P. Sharma, “*Stochastic evolution of innovation diffusion in heterogeneous Population: Emergence of multimodal life cycle patterns*”, *Asia Pacific Operational Research Societies*, I.I.T Delhi, Dec. 2003.
- 32. **Karmeshu**, “*Stochastic modelling of vehicular traffic and their relevance to tele-traffic*”, National Conference on *Transportation*, IIT Delhi, April 2002.
- 33. **Karmeshu**, “*Modelling Information loss in B-ISDN and Mobile Communication Networks*”, Intl. Conf. on *International Security: Management and Technological Challenges*, Organized by MDI, IIM Lucknow, National Inst. Of Urban Affairs and Forum ENGELBURG), New Delhi, Feb. 2001.
- 34. **Karmeshu**, “*Diffusion modelling of e-commerce*”, *International Seminar and e-commerce, opportunities and challenges*, Organized by MDI, IEEE-India, IDRBT held at Delhi Oct. 1999.
- 35. **Karmeshu**, “*Stochastic traffic in high speed network and performance modelling*”, *Symposium on Application of Dynamical Systems in New Emerging Areas*, Indian Science Congress, Mathematics Section, Chennai, Jan. 1999.
- 36. **Karmeshu**, “*Traffic modelling with power law in broadband integrated networks and diffusion approximation models*”, Intl. Conf. On *Operational Research*, New Delhi, Dec. 1998.
- 37. **Karmeshu** and D. Goswami, “*Interactive processes, threshold and nonlinear stochastic models of innovation diffusion*”, *Second National Conference on Mathematical Modelling and Computer Simulation*, IGIDR Mumbai, Aug. 1998.
- 38. **Karmeshu** and D. Goswami, “*Pattern of innovation diffusion in heterogeneous population*”, Intl. Conf. on *System Dynamics*, I.I.T. Kharagpur, Dec. 1998.