Title	Dr.	First Name	Bibudhananda	Last Name	Biswal	Photograph
Designation		Professor				
Address		103, DREAM Building, Gate No. 4, DU North Campus, Delhi - 110007				
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Educational Qualifications

Degree	Institution	Year
PhD	School of Physical Sciences, JNU, Delhi	1994
M.Sc. Physics	PG Department of Physics, Utkal University, Odisha	1988
B.Sc. Physics Hons	B.J.B. College, Odisha	1985
Intermediate Science	B.J.B. College, Odisha	1983

Career Profile

03.2015 –	Professor	Cluster Innovation Centre, University of Delhi
10.2011 – 03.2015	Faculty on Deputation	Cluster Innovation Centre, University of Delhi
01.2008 – 10.2011	Associate Professor in Physics	Sri Venkateswara College, University of Delhi
01.2005 – 12.2008	Reader in Physics	Sri Venkateswara College, University of Delhi
12.2005 – 05.2009	Guest Scientist	Institute for Computational Physics, University of Stuttgart, Germany
07.2000 – 12.2004	Senior Lecturer in Physics	Sri Venkateswara College, University of Delhi
11.1997 – 11.1998	Research Scientist	ICA1, University of Stuttgart, Germany
07.1994 – 07.2000	Lecturer in Physics	Sri Venkateswara College, University of Delhi

Administrative Assignments

1. Coordinator, Design Innovation Centre, University of Delhi, 2015 - 2021
2. Manager, DUCIC Technology Business Incubator, 2015 - 2021
3. Programme Coordinator, B.Tech (IT & Mathematical Innovations) 2012-2015
4. Coordinator, College with Potential for Excellence Funds Utilization, Sri Venkateswara College, University of Delhi, 2004-2005
5. Teacher-in-charge, Department of Physics, Sri Venkateswara College, University of Delhi, 2004-2005
6. Coordinator, Training Program in C & C++ Programming Language, Department of Physics & Astrophysics, University of Delhi, 08 – 15 June 2011
7. Member, Organizing Committee, SERC school on Nonlinear Dynamics, Department of Physics & Astrophysics, University of Delhi, December 2009,

8. Convener, Development Funds Committee, Sri Venkateswara College Staff Council, 2011. Presented a master plan for construction & repair-rnovation for OBC infrastructure expansion
9. ICT Coordinator, Sri Venkateswara College, University of Delhi, 2003-2005, 2009-2011. Leading role in conceiving and managing IT infrastructure, establishing a modern computer centre

Areas of Interest / Specialization

Porous Media:	Pore scale modeling of sandstones and carbonates, Quantitative microstructure characterization, Physical parameters from low resolution images, Modeling of synthetic microCT digital images of multiscale porous media. Simulation of fluid flow inside porous rock
Complex Systems:	Neural network modeling of focal epilepsy, Social network modeling
Nonlinear Dynamics:	Interpretation of chaos control experiments, Time series analysis for Unstable Periodic Orbits, Surrogate analysis
Magnetic Systems:	Ising Model, Critical Dynamics, Dynamic Scaling, Domain Growth

Subjects Taught

Teaching:	Numerical Analysis, Fortran, Pascal, Mathematical Physics, Statistical Physics, Modern Physics & Quantum Mechanics, Biophysics
Modeling & Simulation:	Multiscale porous medium, Fluid flow, Neural Networks, Nonlinear time series analysis, Monte Carlo Simulation
Programming:	Fortran 90, C, Pascal, MPI parallel programming, MATLAB
Graphics/Software:	Gnuplot, XMGR, maple, MATLAB, PovRay, ImageJ etc.
Operating Systems:	Unix, Linux, Windows

Research Guidance

1. Vaibhav Varshney (cosupervisor February 2015 - 2021), Thesis Title: Understanding the Dynamics of Coupled Systems"
2. Nagender Mishra (cosupervisor, October 2010 – May 2015), Thesis title: Dynamics of neuronal networks
3. Kopal Gupta (cosupervisor, June 2004 - April 2006) Thesis title: Complexity Measures of Chaotic Time Series and their Applications, Department of Physics & Astrophysics, University of Delhi
4. Fourier Dzar Eljabbar Latief (partial supervision, May-July 2008), Institute: Physics of Complex Systems, Faculty of Mathematics and Natural Sciences, Bandung Institute of Technology, 40132 Bandung, Indonesia
5. Christian Manwart (partial supervision, Oct 97 - Dec 98) Thesis title: Geometrical Modeling and Transport Properties of Porous Media, Institute for Computational Physics, University of Stuttgart, Germany
6. Jack Widjajakusuma (partial supervision, Mar 98 - July 99) Thesis title: Quantitative Prediction of Effective Material Institute: Institute for Mechanik, Lehrstuhl II, University of Stuttgart, Germany

Publications Profile

Porous Media:

1. *Continuum based rock model of a reservoir dolostone with four orders of magnitude in pore sizes*, S. Roth, **B. Biswal**, G. Afshar, R. J. Held, P.-E. Oren, L. I. Berge, R. Hilfer, **AAPG Bulletin** 95: 925 (2011)
2. *Continuum reconstruction of the pore scale microstructure for Fontainebleau sandstone*, F. D. E. Latief, **B. Biswal**, U. Fauzi, R. Hilfer, **Physica A** 389: 1607 (2010)
3. *Towards precise prediction of transport properties from synthetic computer tomography of reconstructed porous media*, **B. Biswal**, R. J. Held, V. Khanna, J. Wang, R. Hilfer, **Physical Review E** 80: 041301 (2009)
4. *Modeling of multiscale porous media*, **B. Biswal**, P.-E. Oren, R. J. Held, S. Bakke, R. Hilfer, **Image Analysis & Stereology** 28: 23 (2009)
5. *A stochastic multiscale model for carbonate rocks*, **B. Biswal**, P.-E. Oren, R. J. Held, S. Bakke, R. Hilfer, **Physical Review E** 75: 061303 (2007)
6. *Quantitative comparison of mean field mixing laws for conductivity and dielectric constants of porous media*, J. Widjajakusuma, **B. Biswal**, R. Hilfer, **Physica A**, 318:319 (2003)
7. *Macroscopic Dielectric Constant for Microstructures of Sedimentary Rocks*, R. Hilfer,J. Widjajakusuma, **B. Biswal**, **Granular Matter**, 2:137 (2000)
8. *Quantitative Prediction of Effective Material Properties of Heterogeneous Media*, J. Widjajak-usuma, **B. Biswal**, R. Hilfer, **Journal of Computational Material Science**, 16:70 (1999)
9. *Quantitative Analysis of Experimental and Synthetic Microstructures for Sedimentary Rock*, **B. Biswal**, C. Manwart, R. Hilfer, S. Bakke, P. E. Oren, **Physica A**, 273:452(1999)
10. *Exact and approximate calculations for the conductivity of sandstones*, J. Widjajakusuma, C. Manwart, **B. Biswal**, R. Hilfer, **Physica A**, 270:325 (1999)
11. *Microstructure analysis of reconstructed porous media*, B. Biswal, R. Hilfer, **Physica A**, 266:307 (1999)
12. *Threedimensional Local Porosity Analysis of Porous Media*, **B. Biswal**, C. Manwart and R. Hilfer, **Physica A**, 255:221 (1998)

Ising Model:

13. *Multicanonical Simulation of the tails of the order parameter distribution of the two dimensional Ising model*, R. Hilfer, **B. Biswal**, H. G. Mattutis, W. Janke, **Computer Physics Communications**, 169:230 (2005)
14. *Multicanonical Monte Carlo study and analysis of tails for the order parameter distribution of the two dimensional Ising model*, R. Hilfer, **B. Biswal**, H. G. Mattutis and W. Janke, **Physical Review E**, 68:046123 (2003)
15. *Domain Growth in Weakly Disordered Random Magnets*, **B. Biswal**, S Puri, D Chowdhury, **Physica A**, 229:72 (1996)
16. *Interfacial Dynamics in Disordered magnets: Relaxation, Critical Dynamics and Domain Growth*, D. Chowdhury, **B. Biswal**, in **Annual Reviews on Computational Physics, Vol. 1**, (Ed.) D. Stauffer (World Scientific, 1994)
17. *Novel Domain Growth in Weakly Disordered Random Magnets*, D. Chowdhury, **B. Biswal**, **Physica A**, 180:253 (1992)
18. *Dimensionality Dependence in the Singular Dynamic Scaling in the Dilute Ising Model*, **B. Biswal**, D. Chowdhury, **Physical Review A**, 43:4179 (1991)

Complex Systems, Nonlinear Dynamics & Chaos:

19. *Predicting efficacy of antiseizure medication treatment with machine learning algorithms in North Indian population*, Mahima Kaushik, Siddhartha Mahajan, Nitin Machahary, Sarita Thakran, Saransh Chopra, Raj Vardhan Tomar, Suman S. Kushwaha, Rachna Agarwal, Sangeeta Sharma, Ritushree Kukreti, Bibhu Biswal, 205:107404 (2024)
20. *Simulation of Nanocarrier Based Targeted delivery of an antidepressant for Major depression disorder (MDD)*, Vaibhav Mehra, Niloy, Sarkar, Bibhu Biswal, Mahima Kaushik, Molecular Chaos, 49:1465-1477 (2023)
21. *Traveling of extreme events in network of counter-rotating nonlinear oscillators,* Vaibhav Varshney, Suresh Kumarasamy, Ajay Mishra, **Bibhu Biswal**, Awadhesh Prasad, **Chaos**, 31:093136 (2021)
22. *Bifurcation Delay, Travelling Waves and Chimera States in a Network of Coupled Oscillators*, Vaibhav Varshney, Suresh Kumarasamy, **Bibhu Biswal**,Awadhesh Prasad, The European Physical Journal Special Topics, 229(12), 2307-2325 (2020)
23. *A model for the evolution of the neuronal network in kindled brain slices*, Nagender Mishra, Rituraj Karan, **B Biswal**, Harinder P. Singh, **Physica A**, 505:444 (2018)
24. *Targeting periodic solutions of chaotic systems*. Vaibhav Varshney, Pooja Rani Sharma, Manish Dev Shrimali, **B Biswal**, Awadhesh Prasad, Int. J. of Nonlinear Science, 26)(1), 13-21 (2018)
25. *Oscillation death and revival by coupling with damped harmonic oscillator*, Vaibhav Varshney*,* Garima Saxena*,* **B Biswal***, and* Awadhesh Prasad, **Chaos**, 27:093104 (2017)
26. *A model for evolution of overlapping community networks*. Rituraj Karan, **B Biswal**, Physica A, 474: 380-390 (2017)
27. *Reliability of Unstable Periodic Orbit based control strategies in biological systems.* Nagender Mishra, Maria Hasse, **B. Biswal**, H. P. Singh, **Chaos**, 25:043104 (2015)
28. *Adaptive targeting of chaotic response in periodically stimulated neural systems*, K. Gupta, H. P. Singh, **B. Biswal**, R. Ramaswamy, **Chaos** 16:023116 (2006)
29. *Computational modeling of the dependence of kindling rate on network properties*, **B. Biswal**, B. R. Niranjan, G. Ullal, C. Dasgupta, **Physica A** 364:565 (2006)
30. *Strange nonchaotic attractors in driven excitable systems*, A. Prasad, **B. Biswal**, R. Ramaswamy, **Physical Review E**, 68:037201 (2003)
31. *Stochastic Neural Network Model for Spontaneous Bursting in Hippocampal Slices*, **B. Biswal**, C. Dasgupta, **Physical Review E**, 66:051908 (2002)
32. *Neural Network Model for Apparent Deterministic Chaos in Spontaneously Bursting Hippocampal Slice*, **B. Biswal**, C. Dasgupta, **Physical Review Letters**, 88:88102 (2002)
33. *Auto Search for Nonlinear Behaviour in Light Curves of Variable Stars,* M. K. Das, Harinder P. Singh, B. Ramachandran, E. Saikia, P. Narang, **B. Biswal**, S. K. Gupta, S. Joshi*,* in **Automated Data Analysis in Astronomy**, (Ed): R. Gupta, et al., (Narosa Publishers, New Delhi, 2002)
34. *Predicting Dynamics through Artificial Neural Networks*, **B. Biswal**, H. P. Singh, Ranjan Gupta, in **Automated Data Analysis in Astronomy**, (Ed): R. Gupta, et al., (Narosa Publishers, New Delhi, 2002)
35. *Controlling "Chaos" in a Stochastic Neural Network Model for Epileptic Brain Activity*, **B. Biswal**, C. Dasgupta, G. R. Ullal, in **Nonlinear Dynamics and Brain Functioning**, (Ed) N. Pradhan, Paul. E. Rapp and R. Sreenivasan (Nova Science Publishers,1999)

Education, Innovation, Entrepreneurship

36. University-based Mentoring Program for School Going Gifted Students, Jyoti Sharma, B. Biswal, Pankaj Tyagi, Shobha Bagai, Gifted and Talented International,

Conference Organization/ Presentations (in the last three years)

1. Establishing Determinism in Biological Time Series ((nonlinear dynamics interpretation of brain slice experiments), Workshop on Nonlinear Physics and Applications NOLPA 2011, Joao Pessoa, BRAZIL, September 05-09, 2011
2. Characterizing complex microstructures using local porosity theory: Case studies from sandstones and carbonate rocks, International Conference on Challenges of Porous Media, Faraunhofer ITWM, Kaiserslautern, Germany, March 11-14, 2009
3. Detection of unstable periodic orbits in biological time series, Perspectives in Nonlinear Dynamics PNLD 2010, IISc, Bangalore, India, July 21, 2010
4. Modeling of multiscale porous media, 2008 APS March Meeting, New Orleans, USA, March 14, 2008
5. Three dimensional model reconstruction from two dimensional micrographs, DPG Spring Meeting of the Condensed Matter Division, Berlin, Germany, February 28, 2007
6. Unstable periodic orbits and chaos control in a stochastic neural network model for epileptic brain activity, International Seminar on Statistical Physics of Neural Network, Dresden, Germany, March 23, 1999

Research Projects (Major Grants/Research Collaboration)

1. DU Innovation Project on "Development of Intelligent 3d-printed Prosthesis", 6.0 lakhs, 2015-16
2. DU Innovation Project on "Digital Reconstruction of lost art", 7.5 lakhs,15-Nov-13 to 14-NOV-14.
3. *Understanding the dynamics in counter-rotating coupled oscillators,* DST Major Research Project, 2013, 27 lakhs, Co-PI with Awadhesh Prasad
4. DU Innovation Project on "*24x7 Water Supply in villages and small towns of India*",May-15-2012 to Jul-15-2013.
5. DU Innovation Project on "Solutions for road management form modeling and simulation of traffic flow on selected roads of Delhi",May-15-2012 to Jul-15-2013
6. DU Innovation Project on "IT Model for parking space management: Optimal and Efficient parking-retrieval of vehicles",May-15-2012 to Jul-15-2013
7. UGC Major Research Project MRP F. No. 10/11/2002 (SR): "Kindling Model of Focal Epilepsy", 2005 to 2008, 3.87 lakhs

Awards and Distinctions

Inspired Teachers' In-Residence Programme at Rashtrapati Bhavan – 6th June to 12th June, 2015

Association with Professional Bodies

Member, Innovation Committee, PHD Chamber of Commerce & Industry