

## ***BRIEF CURRICULUM-VITAE***

**Dr. Ram Naresh**  
**Professor and Ex- Head**

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### **EDUCATIONAL QUALIFICATIONS**

- Ph.D., I.I.T.Kanpur, 1993, Mathematical Modelling – Air Pollution
- M. Sc.( Mathematics), Kanpur University, 1984, First
- B. Sc., Kanpur University, 1982, First
- Intermediate, U.P.Board, Allahabad, 1980, First
- High School, U.P.Board, Allahabad, 1978, First

### **ACADEMIC POSITION HELD**

- Lecturer, Aug.23, 1993- Aug.22, 1997
- Senior Lecturer, Aug.23, 1997-Aug.22, 2002
- Assistant Professor Aug.23, 2002 – Dec.31, 2005
- Associate Professor Jan.01, 2006 – Aug.22, 2010
- Professor, Since Aug. 23, 2010  
Department of Mathematics, HBTI Kanpur

### **COURSES TAUGHT**

- B.Tech, - Mathematics I, II, III, Computer Oriented Numerical Methods, Computer Oriented Numerical and Statistical Techniques, CONM Lab, Numerical Techniques Lab.
- MCA – Mathematical Foundations of Computer Science, Linear Algebra, Computer Based Optimization Techniques
- M.Tech. – Numerical Methods and Operations Research

### **ACADEMIC DISTINCTIONS/ACHIEVEMENTS**

- Qualified Common Examination for Research Admission, 1985
- Qualified CSIR JRF examination 1986-87.
- **Awarded** CSIR JRF and SRF during Ph.D. program, 1987-1992, IIT Kanpur

- Possessing excellent teaching skills
- Actively engaged in research
- Widely published in international journals
- Peer reviewer of various international journals
- Attended various conferences and refresher courses
- Won “**Best Paper Award**”, 7<sup>th</sup> Annual Conference of VPI, Oct. 24-26, 1997, HBTI, Kanpur
- Won “**Best Paper Prize**”, Conference of Bharat Ganit Parishad, Nov.23-24, 2002, Lucknow University, Lucknow
- Biography included in **Who’s Who in the World 2012 (29<sup>th</sup> Edition)**, Marquis Who’s Who Publications, USA
- Biography included in **Who's Who in Science and Engineering**, 2016-17 (12th Edition) Marquis Who’s Who Publications, USA
- Selected for **Bharat Shiksha Ratan Award 2011** to be conferred by Global Society for Health and Educational Growth, New Delhi, India.
- Selected for **Indira Gandhi Sadbhawana Award 2014** to be conferred by International Business Council
- Selected for **Best Educationist Award 2015** to be conferred by International Institute of Education and Management, New Delhi, India

### INVITED LECTURES DELIVERED

- Delivered two invited expert lectures on “**Environmental Pollution**” at IIT Kanpur during UNESCO Regional Training Programme in “Mathematical Modelling of Fluid Flows, Diffusion and Environmental Pollution”, March 12-24, 2001
- Delivered two invited lectures on “**Modelling of Environmental Systems and effects of removal mechanisms**” in a Short Term Training Programme on “Modelling and Simulation of Engineering and Environmental Systems” at Beant College of Engineering and Technology, Gurdaspur, Punjab, March 15-19, 2004.
- Delivered invited lecture on “**Removal of air pollutants from the atmosphere of an industrial city by monsoon rain: Nonlinear Modeling and Analysis**” in “Symposium on Recent Advances in Mathematical Sciences” at IIT Kanpur Feb.16-17, 2007.
- Delivered invited lecture on “**Mathematical Modelling**” in a Conference on the eve of Birth day celebration of Prof. Harish Chandra, the great mathematician, at VSSD College, Kanpur, Oct. 11, 2007
- Delivered lecture on “**Mathematical Modelling-A General Framework**” in a Lecture Series on “Mathematical Modelling and Systems Simulation”, Feb.19-March 31, 2010, HBTI Kanpur.
- Delivered lecture on “**Mathematical Modelling- Real Life Applications**” in a Lecture Series on “mathematical Modelling and Systems Simulation”, Feb.19-March 31, 2010, HBTI Kanpur

- Delivered lecture on “**Mathematics and Environmental Pollution**” at Bhabha Institute of Technology, Kanpur, Oct. 10, 2010.
- Delivered lecture on “**Role of Mathematics in Real Life Applications**” at DAV College, Kanpur, Oct. 11, 2010.
- Delivered invited lecture on “**Role of environmental and ecological factors on the spread of infectious diseases**” in a *National Seminar on Recent Advances in Mathematics and its Applications*, BND College Kanpur, Feb. 12, 2011.
- Delivered an invited talk on “**Modelling the biological control of Malaria**” and chaired two sessions on Environmental and Social Systems in a National Conference on Mathematical Modelling and Computer Simulation, Bhabha Group of Institutions, Kanpur(D), July 7-9, 2011
- Delivered an invited talk on “**Survival of resource dependent species in a polluted environment**” in **International Conference on Mathematical Modelling and Computer Simulation**, Bhabha Group of Institutions, Kanpur(D), Feb.17-18, 2012
- Invited to deliver talk on “**Modelling the effect of disinfectants in controlling the bacterial disease-tuberculosis**”, Symposium on Biomathematics, Annual Conference of Indian Mathematical Society, Banaras Hindu University, Varanasi, Jan.22-25, 2013. (*Could not attend*)
- Participated in Panel discussion on **Research Meet on Social Needs** related to Ecology, Environment, Epidemic, Resource Conservation, Awareness Program, Terrorism and IT at BGI Kanpur, June 8, 2013 and delivered lecture on **Environmental Conservation**.
- Delivered an invited talk on “**Modeling the removal of carbon dioxide to reduce global warming by introducing aqueous ammonia solution near the source and external liquid species in the atmosphere**” in National Conference of Mathematics, University of Lucknow, Lucknow, Nov.29-Dec.01, 2013
- Delivered an invited talk on “**Modelling the removal of carbon dioxide from the atmosphere to reduce global warming**” in International Conference on Mathematical Modelling and Computer Simulation with Applications (ICMMCSA) at IIT Kanpur, Dec. 31, 2013- Jan. 02, 2014 and **chaired a technical session**.
- Delivered an invited talk on “**Modelling the control of tuberculosis using disinfectants**” in National Conference on Recent Advancements in Mathematics, Beant College of Engineering and Technology, Gurdaspur, Punjab, Feb. 01-02, 2014 and **chaired a technical session**.
- Delivered an invited talk on “**AIDS Modeling: Epidemiological and Mathematical Considerations**” in National Workshop on ‘Theory and Applications of Mathematical and Computational Biology’, Jan. 22-24, 2015, ABV-IIIT Gwalior.
- Delivered an invited talk on “**Environmental Pollution**” in National Workshop on ‘Theory and Applications of Mathematical and Computational Biology’, Jan. 22-24, 2015, ABV-IIIT Gwalior.
- Delivered an invited talk as a **Guest of Honour** in Ramanujan Memorial Lecture series, Dec. 19, 2015, B.N.D.College Kanpur

- Delivered lecture as **Chief Guest** on the eve of **National Mathematics Day Seminar**, Dec. 22, 2015, Shri Shakti Degree College, Ghatampur, Kanpur
- Delivered an invited talk on “**Role of ecological factors on the spread of tuberculosis and its control using disinfectants**” in Twentieth Annual Conference of Gwalior Academy of Mathematical Sciences and Symposium on Mathematics in Real Life Problems with Special Reference to Life Sciences, Feb.5-7, 2016, Jiwaji University, Gwalior.
- Delivered an invited talk on “**Modeling the dynamics of dust scavenging from the near earth atmosphere**” in International Conference on Mathematical Modeling, Differential Equations, Scientific Computing & Applications (ICMMDESCA-2016), March 27-29, 2016, IIT Kanpur and **Chaired a Technical Session** (March 29, 2016).

### **RESEARCH ACTIVITIES**

#### **RESEARCH EMPLOYMENT**

- (i) JRF in a project on “Air Pollution” Dec. 1984 - July 1987
- (ii) Senior Project Fellow on “Dispersion of Air Pollutants and its Control by Greenbelt”, Sep. 1992- April 1993
- (iii) Research Associate in a project on “Water Pollution and its effects on Ecosystems”, May 1993 – August 1993.

**Department of Mathematics, IIT Kanpur**

#### **RESEARCH INTEREST**

- Mathematical Modelling of Environmental & Ecological systems.
- Mathematical Epidemiology, Transmission dynamics of HIV/AIDS.
- Nonlinear Dynamics

#### **Ph.D. THESIS SUPERVISION** (Awarded-05, In Progress -01)

- **The transmission dynamics of AIDS epidemic: Some nonlinear mathematical models**, Sandip Omar, CSJM University Kanpur, 2004.
- **Removal of air pollutants from the atmosphere by precipitation: Mathematical models and their analyses**, Shyam Sundar, U. P. Technical University, Lucknow, 2008.
- **Mathematical modeling of the transmission of AIDS epidemic: Nonlinear models and their analyses**, Agraj Tripathi, U. P. Technical University, Lucknow, 2009.
- **Mathematical modeling of the spread of infectious diseases: demographic and environmental effects**, Surabhi Pandey, G.B. Technical University, Lucknow, August 2012.

- **Mathematical modeling of the spread of AIDS epidemic in a variable size population**, Dileep Sharma, G. B. Technical University, Lucknow, March 2013.
- **Mathematical modeling of acid rain and its effects on ecological and biological systems**, Shivangi, U.P. Technical University, Lucknow, Work in progress.

## **RESEARCH CONTRIBUTION**

Environmental pollution, global warming and spread of infectious diseases including the transmission of HIV/AIDS are major issues today before the mankind. These issues have been addressed in the form of research papers. The scientific contributions are significant and well recognized both at national and international level as is evident from the research publications in international journals. Presently, we are also studying the role of media awareness/campaign in containing the spread of infectious diseases. Some specific issues that have been addressed are summarized below.

### **1. Global Warming**

Global warming is a serious threat to our planet due to emission of greenhouse gases into the atmosphere. Due to continuous increase in the concentration of greenhouse gases, emitted into the atmosphere from natural as well as anthropogenic sources, the temperature of the earth's atmosphere is increasing leading to various environmental consequences including climate change. The CO<sub>2</sub> gas is the largest contributor to global warming. We have suggested mechanisms to reduce the concentration of carbon dioxide gas in the atmosphere. One of my paper "***Removal of carbon dioxide from the atmosphere to reduce global warming: A modeling study***" published in *International Journal of Global Warming*, 7(2), 270-292, 2015, was selected (**Article Featured in Press**) as potentially being of broad interest to non-specialists audience and a news item was prepared by the publisher, based on the results described in the paper, to run it via an appropriate news wire service in international media. The findings suggest that the carbon dioxide would be removed from the atmosphere through the introduction of aerosols or particulates (calcium oxide) that would sequester carbon dioxide so that it would precipitate out of the atmosphere. The greenhouse gases could then be eliminated from the atmosphere. Further, the absorption of carbon dioxide would be carried out by plant photosynthesizing species.

### **2. Removal of air pollutants and effects on biological species**

Air pollution is one of the most challenging problems which our industrial cities face today as their atmospheres are getting highly polluted due to discharges of gaseous and particulate matters from various household, industrial and vehicular sources. One such example is the city of Kanpur in India which is highly polluted by various kinds of gases and particulate

matters emitted from different types of industries and vehicular exhausts. Gases like SO<sub>2</sub> and NO<sub>2</sub> released from industries, power plants etc., when reach high into the atmosphere and combine with moisture, form acid rain which is very harmful to ecosystems. When rainy season comes, the rain washes the city lanes, streets, buildings and cleans the atmosphere at least for a few months. We have developed nonlinear mathematical models and suggested mechanisms for removal of air pollutants from the atmosphere in the form of precipitation scavenging, greenbelt plantation etc. through these models. The work and inferences drawn are of immense use to scientists and mathematicians working in the area to understand the dynamics of nonlinear phenomenon of interactions of pollutants with raindrops, which in turn, may suggest method for cloud seeding leading to artificial rain. The effect of pollutants/toxicants and acid rain on plant and biological species have also been studied. The analysis of above work also suggests a mechanism by which toxic gases leaked out in the atmosphere due to accidental discharge etc. can be removed by introducing suitable liquid or gaseous phase in the environment.

### **3. Transmission of HIV/AIDS and other infectious diseases**

The human immunodeficiency virus (HIV) infection, which can cause acquired immunodeficiency syndrome (AIDS), has shown a high degree of prevalence in populations all over the world. The most susceptible individuals at risk of acquiring infection include people having sexual contacts with HIV infecteds, homosexual and bisexual men, intravenous drug abusers and persons transfused with contaminated blood. Mathematical models of transmission dynamics of HIV play an important role in better understanding of epidemiological patterns for disease control as they provide short and long term prediction of HIV and AIDS incidence. Several papers have been published to understand the spread of HIV/AIDS under various epidemiological conditions addressing issues like mother-to-child transmission, immigration of HIV infectives in susceptible population, screening of unaware infectives, HIV-TB co-infection, contact tracing, vaccination threshold, risky sexual behavior and subsequent control measures. The study of other infectious diseases like Japanese encephalitis, tuberculosis, malaria etc. under the influence of degraded environmental conditions and subsequent control measures have also been taken up and various suggestions given.

### **SPONSORED RESEARCH PROJECT**

A major research project on “**Mathematical modeling of air pollutants removal by precipitation**” sponsored by University Grants Commission, New Delhi is completed (Feb.2011-Jan 31, 2014) as Principal Investigator.

## **PEER REVIEWER OF JOURNALS**

- Journal of Operations Research
- Applied Mathematical Modelling (Elsevier)
- Applied Mathematics and Computation (Elsevier)
- Nonlinear Analysis: Modelling and Control
- Far East Journal of Mathematical Sciences
- Journal of Mathematical Control Science and Applications
- Mathematics and Computers in Simulation (Elsevier)
- International Journal of System Science
- International Journal of Biomathematics (World Scientific)
- Proceedings of the National Academy of Sciences, India
- Journal of Applied Mathematics and Computing
- Discrete Dynamics in Nature and Society
- Bulletin of Mathematical Biology
- World Journal of Modelling and Simulation (World Academic Union)
- International Journal of Applied Mathematics and Computation
- Mathematical and Computer Modelling (Elsevier)
- Chaos, Solitons and Fractals (Elsevier)
- Applications and Applied Mathematics: An International Journal
- Differential Equations and Dynamical Systems (Springer)
- International Journal of Bifurcation and Chaos
- Global Journal of Science Frontier Research
- American Journal of Computational and Applied Mathematics
- Applied Mathematics (Scientific & Academic Publishers, USA)
- Journal of Biomathematics (Scientific & Academic Publishers, USA)
- Nonlinear Analysis: Real World Applications (Elsevier)
- Journal of Biological Physics (Springer)
- International Journal of Mathematical Modeling and Computations

## **EDITORIAL BOARD MEMBERSHIP**

- Member, Editorial Board, International Journal of Applied Mathematics and Computation
- Invited to act as Lead Guest Editor, Journal of Applied Mathematics, Hindawi Publishers., USA, 2011
- Member, International Editorial Board, IOSR Journal of Mathematics
- Invited to act as Guest Editor of special issue of a journal by Scientific and Academic Publishing, USA, Sep. 2013

## **RESEARCH PAPERS PUBLISHED IN JOURNALS**

- Environmental Modelling and Assessment (Elsevier)
- Mathematical and Computer Modelling (Elsevier)
- Applied Mathematical Modelling (Elsevier)
- Nonlinear Analysis: Real World Applications (Elsevier)

- Natural Resource Modelling (Wiley Blackwell)
- Nonlinear Analysis: Modelling and Control
- Applied Mathematics and Computation (Elsevier)
- Computers and Mathematics with Applications (Elsevier)
- International Journal of Nonlinear Sciences and Numerical Simulation (Freund Pub., Israel))
- Applications and Applied Mathematics: An International Journal
- Mathematical Modelling and Analysis
- Journal of Nature Science and Sustainable Technology (Nova Sc. Pub.)
- Journal of Mathematical Control Science and Applications
- Earth Moon and Planets
- International Journal of Applied Mathematics and Computation
- International Journal of Biomathematics (World Scientific)
- Iranian Journal of Optimization
- World Journal of Modelling and Simulation (World Academic Union)
- American Journal of Computational and Applied Mathematics
- International Journal of Nonlinear Sciences (World Academic Union)
- Meteorology and Atmospheric Physics (Springer)
- International Journal of Global Warming (Inderscience)
- Computational Ecology and Software
- American Journal of applied Mathematics and Statistics

#### **RESEARCH PAPERS PUBLISHED (International – 52, National -10)**

1. Effect of environmental tax on carbon dioxide emission: A mathematical model, Shyam Sundar, Ashish Kumar Mishra and **Ram Naresh**, *American Journal of Applied Mathematics and Statistics*, 49(1), 16-23, 2016
2. Removal of carbon dioxide from the atmosphere to reduce global warming: A modeling study, J.B.Shukla, M.S.Chauhan, Shyam Sundar, **Ram Naresh**, *International Journal of Global Warming*, 7(2), 270-292, 2015
3. Modeling and analysis of the survival of a biological species in a polluted environment: Effect of environmental tax, Shyam Sundar & **Ram Naresh**, *Computational Ecology and Software*, 5(1), 201-221, 2015
4. Modeling the dynamics of carbon dioxide removal in the atmosphere, Shyam Sundar, **Ram Naresh**, Ashish Kumar Misra & Agraj Tripathi, *Computational Ecology and Software*, 4(4), 248-268, 2014
5. Modeling the effect of toxicant on plant biomass with time delay, **Ram Naresh**, Dileep Sharma and Shyam Sundar, *International Journal of Nonlinear Sciences*, 17(3), 254-267, 2014 (World Academic Press, UK)
6. Modelling and analysis of acid rain formation due to precipitation and its effects on plant species, J. B. Shukla, Shyam Sundar, Shivangi and **Ram Naresh**, *Natural Resource Modelling*, 26(1), 53-65, 2013
7. Modeling the effects of aerosols to increase rainfall in regions with shortage, J.B.Shukla, Shyam Sundar, A. K. Misra and **Ram Naresh**, *Meteorology and Atmospheric Physics*, 120(3-4), 157-163, 2013



8. Modelling the dynamics of HIV-TB co-infection in a variable size population, Agraj Tripathi, **Ram Naresh** and Dileep Sharma, In: *Dynamical Systems: Theory, Applications and Future Directions* (Ed: J. M. Tchuente) NOVA Science Publishers Inc. USA, Chapter 12, pp. 315-334, 2013. ISBN: 978-1-62808-001-8
9. Modeling the role of cloud density on the removal of gaseous pollutants and particulate matters from the atmosphere, Shyam Sundar, Rajan K. Sharma and **Ram Naresh**, *Applications and Applied Mathematics: An International Journal*, 8(2), 416-435, 2013
10. Modelling the spread of HIV/AIDS with infective immigrants and time delay, Agraj Tripathi, **Ram Naresh**, Jean M. Tchuente and Dileep Sharma, *International Journal of Nonlinear Sciences*, 16(4), 313-322, 2013
11. Modelling the removal by rain of two gaseous pollutants and a particulate matter formed by these two reacting gases in the atmosphere: A model, J. B. Shukla, **Ram Naresh** and Shyam Sundar, *International Journal of Applied Mathematics and Computation*, 4(2), 183-193, 2012
12. Effect of intermediate toxic product on the survival of a resource dependent species: A modeling study, **Ram Naresh** and Shyam Sundar, *American Journal of Computational and Applied Mathematics*, 2(5), 197-205, 2012
13. Role of vapor and cloud droplets on the removal of primary gaseous pollutants forming secondary species from the atmosphere: A modeling study, Shyam Sundar and **Ram Naresh**, *International Journal of Nonlinear Sciences*, 14(2), 131-141, 2012
14. Modeling the effect of environmental factors on the spread of bacterial disease in an economically structured population, **Ram Naresh** and Surabhi Pandey, *Applications and Applied Mathematics: An International Journal*, 7(1), 426-454, 2012
15. Modeling the effect of time delay in controlling the carrier dependent infectious disease-cholera, A. K. Misra, S. N. Misra, A. L. Pathak, Peeyush Misra and **Ram Naresh**, *Applied Mathematics and Computation*, 218(23), 11547-11557, 2012
16. A nonlinear AIDS epidemic model with screening and time delay, **Ram Naresh**, Agraj Tripathi and Dileep Sharma, *Applied Mathematics and Computation*, 217(9), 4416-4426, 2011
17. A nonlinear HIV/AIDS model with contact tracing, **Ram Naresh**, Agraj Tripathi and Dileep Sharma, *Applied Mathematics and Computation*, 217, 9575-9591, 2011.
18. An HIV/AIDS model with vertical transmission and time delay, **Ram Naresh** and Dileep Sharma, *World Journal of Modelling and Simulation*, 7(3), 230-240, 2011.
19. Role of cloud droplets on the removal of gaseous pollutants from the atmosphere: A nonlinear model, Shyam Sundar and **Ram Naresh**, *International Journal of Applied Mathematics and Computation*, 3(4), 272-282, 2011.
20. How artificial rain can be produced? A mathematical model, J. B. Shukla, A. K. Misra, **Ram Naresh** and Peeyush Chandra, *Nonlinear Analysis: Real World Applications*, 11, 2659-2668, 2010.

21. AIDS epidemic modeling with different demographic structures, Agraj Tripathi and **Ram Naresh**, *Iranian Journal of Optimization*, 2(1), 270-307, 2010.
22. Mathematical modeling and analysis of the removal of gaseous pollutants by precipitation using general nonlinear interaction, Shyam Sundar and **Ram Naresh**, *International Journal of Applied Mathematics and Computation*, 2(2), 45-56, 2010
23. An epidemic model for the transmission dynamics of HIV/AIDS and another infection, Sandip Omar and **Ram Naresh**, *International Journal of Mathematical Archive*, 1(3), 68-72, 2010
24. Modelling and analysis of the spread of AIDS epidemic with immigration of HIV infectives, **Ram Naresh**, Agraj Tripathi and Dileep Sharma, *Mathematical and Computer Modelling*, 49, 880-892, 2009
25. Modelling the cumulative effect of ecological factors in the habitat on the spread of tuberculosis, **Ram Naresh**, Surabhi Pandey and J. B. Shukla, *International Journal of Biomathematics*, 2(3), 339-355, 2009.
26. Stability Analysis of a time delayed SIR epidemic model with nonlinear incidence rate, **Ram Naresh**, Agraj Tripathi, J. M. Tchuente and Dileep Sharma, *Computers and Mathematics with Applications*, 58, 348-359, 2009
27. Modelling the effect of tuberculosis on the spread of HIV infection in a population with density dependent birth and death rate, **Ram Naresh**, Dileep Sharma and Agraj Tripathi, *Mathematical and Computer Modelling*, 50, 1154-1166, 2009.
28. A nonlinear mathematical model to study the interactions of hot gases with cloud droplets and raindrops, Shyam Sundar, **Ram Naresh**, A. K. Misra and J. B. Shukla, *Applied Mathematical Modelling*, 33(7), 3015-3024, 2009
29. Modelling and analysis of the spread of Japanese Encephalitis with environmental effects, **Ram Naresh** and Surabhi Pandey, *Applications and Applied Mathematics: An International Journal*, 4(1), 155-175, 2009
30. A nonlinear mathematical model for Asthma: Effect of environmental pollution, **Ram Naresh** and Agraj Tripathi, *Iranian Journal of Optimization*, 1, 24-56, 2009.
31. Modelling the effect of risky sexual behaviour on the spread of HIV/AIDS, **Ram Naresh**, Dileep Sharma and Agraj Tripathi, *International Journal of Applied Mathematics and Computation*, 1(3), 132-147, 2009.
32. A model for HIV/AIDS transmission in a two sex population, **Ram Naresh**, Agraj Tripathi and Dileep Sharma, In: *Advances in Disease Epidemiology* (Ed: J. M. Tchuente and Z. Mukandavire), NOVA Science Publishers, USA, 2009, pp.243-270. ISBN :978-1-60741-452-0
33. Analysis of a vaccination model for carrier dependent infectious diseases with environmental effects, **Ram Naresh**, Surabhi Pandey and A. K. Misra, *Nonlinear Analysis: Modelling and Control*, 13(3), 331-350, 2008
34. Analysis of the effect of vaccination on the spread of AIDS epidemic using Adomian Decomposition Method, **Ram Naresh**, Agraj Tripathi, J. Biazar and Dileep Sharma, *Int. J. Nature Science and Sustainable Technology*, 2(1/2), 183-214, 2008.

35. Modelling the removal of gaseous pollutants and particulate matters from the atmosphere of a city by rain: Effect of cloud density, J. B. Shukla, Shyam Sundar, A. K. Misra and **Ram Naresh**, *Environmental Modelling and Assessment*, 13, 255-263, 2008
36. Effect of rain on removal of a gaseous pollutant and two different particulate matters from the atmosphere of a city, J. B. Shukla, A. K. Misra, Shyam Sundar and **Ram Naresh**, *Mathematical and Computer Modelling*, 48, 832-844, 2008.
37. Modelling the removal of gaseous pollutants and particulate matters from the atmosphere of a city, **Ram Naresh**, Shyam Sundar and J. B. Shukla, *Nonlinear Analysis: Real World Applications*, 8, 337-344, 2007.
38. Modelling the effect of screening of unaware infectives on the spread of HIV infection, Agraj Tripathi, **Ram Naresh** and Dileep Sharma, *Applied Mathematics and Computation*, 184, 1053-1068, 2007
39. A nonlinear dynamical model to study the removal of gaseous and particulate pollutants in a rain system, **Ram Naresh** and Shyam Sundar, *Nonlinear Analysis: Modelling and Control*, 12(2), 227-243, 2007
40. Modelling the effect of precipitation on the removal of gaseous pollutants forming secondary species and particulate matters, **Ram Naresh** and Shyam Sundar, *Journal of Mathematical Control Science and Applications*, 1(2), 223-239, 2007
41. Modelling the removal of primary and secondary air pollutants by precipitation, **Ram Naresh**, Shyam Sundar and R. K. Upadhaya, *Int. J. Nonlinear Sciences and Numerical Simulation*, 7(3), 285-294, 2006.
42. Modelling the removal of primary and secondary pollutants from the atmosphere of a city by rain, **Ram Naresh**, Shyam Sundar and J. B. Shukla, *Applied Mathematics and Computation*, 179, 282-295, 2006.
43. Modeling the spread of AIDS epidemic with vertical transmission, **Ram Naresh**, Agraj Tripathi and Sandip Omar, *Applied Mathematics and Computation*, 178, 262-272, 2006.
44. Modelling the effect of an intermediate toxic product formed by uptake of a toxicant on plant biomass, **Ram Naresh**, Shyam Sundar and J. B. Shukla, *Applied Mathematics and Computation*, 182, 151-160, 2006.
45. Modelling and analysis of HIV-TB co-infection in a variable size population, **Ram Naresh** and Agraj Tripathi, *Mathematical Modeling and Analysis*, 10(3), 275-286, 2005.
46. Modelling the removal of gaseous pollutants and particulate matters by heavy rain, **Ram Naresh** and Shyam Sundar, *Far East J. Appl. Math.*, 20(2), 169-178, 2005.
47. Modelling and analysis of HIV/AIDS in a variable size population, **Ram Naresh**, Sandip Omar and Agraj Tripathi, *Far East J. Appl. Math.*, 18(3), 345-360, 2005.
48. Effect of toxicants on plant biomass : a nonlinear model, **Ram Naresh**, Shyam Sundar and J. B. Shukla, Edited Volume on *Mathematical Biology* (eds. P. Chandra & B. V. Rathish Kumar) Anamaya Publishers, New Delhi, pp. 260-265, 2005.

49. An analytical approach to study the problem of air pollutants removal in a two patch environment, **Ram Naresh**, *Ultra Science* (Int. J. Physical Sc.), 16(1)M, 83-96, 2004.
50. Qualitative analysis of a nonlinear model for removal of air pollutants, **Ram Naresh**, *Int. J. Nonlinear Sciences and Numerical Simulation*, 4(4), 379-386, 2003.
51. Analysis of a nonlinear AIDS epidemic model with standard incidence, **Ram Naresh** and Sandip Omar, *Ultra Science* (Int. J. Physical Sc.), 15(1)M, 63-70, 2003.
52. The transmission of AIDS epidemic : A mathematical model, **Ram Naresh** & Sandip Omar, *Ultra Science* (Int. J. Physical Sc.), 13(1), 87-93, 2001.
53. Understanding the transmission of HIV/AIDS : Some epidemiological considerations, **Ram Naresh** & Sandip Omar, *Appl. Sc. Pl.*, Vol. II, 1-9, 2000.
54. Dispersion of heavier air pollutant in a two patch environment : Effect of removal mechanism, **Ram Naresh**, *Math. Analysis & Applications*. (Dwivedi A. P. ed) 140-150, Narosa Publ. House, New Delhi, India, 2000.
55. The transmission dynamics of HIV/AIDS : Some basic models, **Ram Naresh**, *Math. Analysis & Applications* (Dwivedi, A.P. ed). 166-173, Narosa Publ. House, New Delhi, India, 2000.
56. Modelling the dispersion of air pollutant from a time dependent point source : Effect of precipitation scavenging, **Ram Naresh**, *J. MACT*, 32, 77-91, 1999.
57. Modelling the removal of pollutants from the atmosphere of an industrial city by monsoon rain, J. B. Shukla, A. Agarwal, **Ram Naresh** & B. Dubey, *Recent Trends in Industrial & Applied Mathematics*, (M. Kumar, ed) 184-198, 1998.
58. Effect of removal mechanism on dispersion of air pollutant from a time dependent point source, J. B. Shukla, **Ram Naresh**, R. S. Chauhan & M. Agarwal, *Precipitation Scavenging and Atmosphere-Surface Exchange*, vol.3 (Schwartz S.E. & Slinn W.G.N., ed.) 1233-1243, 1992, Hemisphere Pub. Corp., USA.
59. Effect of rain washout on dispersion of air pollutant in the atmosphere, J.B. Shukla, **Ram Naresh** & R.S.Chauhan, *Precipitation Scavenging and Atmosphere-Surface Exchange*, vol.3 (Schwartz S.E. & Slinn W.G.N., ed.) 1245-1253, 1992, Hemisphere Pub. Corp., USA
60. An ecological type non-linear model for removal mechanism of air pollutant, J. B. Shukla, M. Agarwal & **Ram Naresh**, *Precipitation Scavenging and Atmosphere-Surface Exchange*, vol.3 (Schwartz S.E. & Slinn W.G.N., ed.) 1255-1263, 1992, Hemisphere Pub. Corp., USA
61. The effects of chemical reactions on dispersion of air pollutants over area sources, **Ram Naresh** & R. Nath, *Earth Moon & Planets* (An International Journal of Comparative Planetology) The Netherlands, 48 (2), 99-111, 1990.
62. Dispersion of air pollutant from a time dependent point source : Effect of greenbelt, J. B. Shukla, M. Agarwal, R.S. Chauhan, Raj Nath & **Ram Naresh**, *Proceedings Int. Conf. On Tropical Micro-Meteorology & Air Pollution*, pp.257-259, 1988.

## **PAPERS PRESENTED IN CONFERENCES**

1. A nonlinear mathematical model to study the removal of gaseous pollutants by rain: Effect of density of cloud droplets, **Ram Naresh** and Shyam Sundar, Conference of International Academy of Physical Sciences, Feb. 20-22, 2010, University of Allahabad, India
2. A nonlinear HIV/AIDS model with contact tracing, **Ram Naresh**, Agraj Tripathi and Dileep Sharma, Conference of International Academy of Physical Sciences, Feb. 20-22, 2010, University of Allahabad, India
3. Removal of air pollutants from the atmosphere of an industrial city by precipitation : Nonlinear modelling and analysis, **Ram Naresh** and Shyam Sundar, Symposium on Recent Advances in Mathematical Sciences, Feb.16-17, 2007, IIT Kanpur.
4. Modelling the effect of contact tracing of infectives on the spread of HIV/AIDS, **Ram Naresh**, Sandip Omer and Agraj Tripathi, International Conference on Mathematical Modelling and Computer Simulation, Dec. 12-15, 2006, LNM IIT Jaipur
5. Modelling the removal of primary, secondary and particulate air pollutants by rain, **Ram Naresh**, Shyam Sundar and J.B.Shukla, International Conference on Mathematical Modelling and Computer Simulation, Dec. 12-15, 2006, LNM IIT Jaipur
6. Effect of tuberculosis on the transmission of HIV in a variable size population, **Ram Naresh** & Agraj Tripathi, Symposium on Current Trends in Biomathematics, March 14, 2005, IIT Roorkee.
7. Removal of gaseous and particulate air pollutants from the atmosphere by precipitation: Nonlinear models and their analyses, **Ram Naresh** & Shyam Sundar, Symposium on Current Trends in Biomathematics, March 14, 2005, IIT Roorkee.
8. Analysis on a nonlinear AIDS epidemic model with vertical transmission, **Ram Naresh**, Sandip Omar & Agraj Tripathi, Symposium on Current Trends in Biomathematics, March 14, 2005, IIT Roorkee.
9. An epidemic model for the transmission dynamics of HIV/AIDS, **Ram Naresh** & Sandip Omar, Symposium on Current Trends in Biomathematics, March 14, 2005, IIT Roorkee.
10. Modelling the transmission of HIV/AIDS in a variable size population, **Ram Naresh**, Sandip Omar & Agraj Tripathi, International Conference on Mathematical Biology, Feb. 19-21, 2004, IIT Kanpur

11. Analysis of a nonlinear model for removal of pollutants by precipitation, **Ram Naresh**, Shyam Sundar & J.B.Shukla, International Conference on Mathematical Biology, Feb. 19-21, 2004, IIT Kanpur
12. Nonlinear modeling of the removal of pollutants (Gases and Particulate matters) from the atmosphere, J.B.Shukla, **Ram Naresh** & Shyam Sundar, International Symposium on Nonlinear Analysis and Applications, Jan. 2-4, 2003, Science City, Kolkata.
13. Modelling the effect of chemical defense mechanism on two competing species, J.B.Shukla, Shalini Sharma, **Ram Naresh** & P. Sinha, Conference on Mathematical Modelling and Computer Simulation, Nov. 14-15, 2002, NAL, Bangalore.
14. Removal of a reactive pollutant from the atmosphere by green belt, J.B.Shukla and **Ram Naresh**, Conference on Mathematical Modelling and Computer Simulation, Nov. 14-15, 2002, NAL, Bangalore.
15. Models for removal of pollutants from the atmosphere of an industrial city by rain, J.B.Shukla, Shyam Sundar & **Ram Naresh**, Conference on Mathematical Modelling and Computer Simulation, Nov. 14-15, 2002, NAL, Bangalore.
16. Qualitative analysis of nonlinear AIDS epidemic model, **Ram Naresh**, Sandip Omar & J.B.Shukla, Conference on Mathematical Modelling and Computer Simulation, Nov. 14-15, 2002, NAL, Bangalore.
17. A mathematical model for removal of air pollutants by precipitation, **Ram Naresh**, Bharat Ganit Parishad Conference on Mathematics, Nov. 23-24, 2002, Lucknow University, Lucknow.
18. Some models for removal of pollutants from the atmosphere of industrial city by rain, **Ram Naresh** & J.B.Shukla, Conference on Mathematical Modelling and Computer Simulation, Oct. 23-24, 2000, NEERI, Nagpur.
19. Removal of air pollutants and control of its dispersal in the atmosphere by greenbelt, **Ram Naresh** & J.B.Shukla, Conference on Mathematical Modelling and Computer Simulation, Oct. 23-24, 2000, NEERI, Nagpur.
20. Dispersion of heavier air pollutants forming secondary species: effect of removal mechanism, **Ram Naresh**, VIIth Annual Conference of VPI, Oct. 24-26, 1997, HBTI Kanpur.

### **BOOK PUBLISHED**

1. **Joint Editor** of the book “Mathematical Analysis & Applications” published by Narosa Publishing House, New Delhi, 2000.
2. A Text Book on **Engineering Mathematics**, In Progress

## **MEMBERSHIP OF PROFESSIONAL SOCIETIES**

- (i) Member, Indian Society of Nonlinear Analysts, 2002-03
- (ii) Life member, Bharat Ganit Parishad
- (iii) Life Member, Indian Academy of Mathematical Modelling and Simulation (IAMMS)
- (iv) Annual Member, Indian Society for Technical Education, 2009-10

## **CONFERENCE/REFRESHER COURSE ORGANISED/CO-ORGANISED**

- (i) **Convenor**, Refresher Course on “Applied Mathematical Techniques for Chemical Sciences”, April 11-15, 2007, HBTI Kanpur
- (ii) **Member**, Organizing Committee in the Workshop on “Applications of Mathematics in Engineering and Technology”, Sept.8, 2007, HBTI Kanpur
- (iii) **Member**, Organizing Committee in the Workshop on “Role of Mathematics in Science and Technology”, Oct.24, 2007, HBTI Kanpur.
- (iv) **Assistant Organizing Secretary**, Seventh Annual Conference of Vijnana Parishad of India, Oct.24-26, 1997, HBTI, Kanpur.
- (v) **Member**, National Advisory Committee, National Seminar on Recent Advances in Mathematics and its Applications, Feb.12, 2011, BND College, Kanpur
- (vi) **Convener**, Symposium on Biomathematics, 74th Annual Conference of Indian Mathematical Society, Jan.22-25, 2013, Banaras Hindu University, Varanasi.

## **SYMPOSIA/CONFERENCE/ATTENDED/INVITED**

- (i) International Symposium on Mathematical Modelling of Ecological, Environmental & Biological Systems, August 27-30, 1985, IIT, Kanpur.
- (ii) All India Symposium on System Science: Theory and Application to Biology, March 10-11, 1986. Jiwaji University, Gwalior.
- (iii) Fifth International Conference on Precipitation Scavenging and Atmosphere-Surface Exchange Processes, July 15-19, 1991, Richland, Washington, USA (Invited to present a paper but could not attend)
- (iv) Conference on “Recent Trends in Mathematics and Applications” & National Symposium on “Dedication of Prof. J.N. Kapur to Mathematics and Mathematics Education”, Sep. 7, 1993, HBTI, Kanpur.
- (v) Fifth International Conference on Atmospheric Science and Application to Air Quality, June 18-20, 1996, Seattle, Washington, USA (Invited to present a paper but could not attend).
- (vi) Seventh Annual Conference of Vijnana Parishad of India, Oct.24-26, 1997, HBTI, Kanpur
- (vii) Seminar to Commemorate the 78<sup>th</sup> Birthday of Prof. Harish Chandra, Oct 11, 2000, Department of Mathematics, HBTI, Kanpur.

- (viii) ISMMACS Annual Conference on Mathematical Modelling and Computer Simulation, Oct.23-24, 2000, National Environmental Engineering Research Institute, Nagpur.
- (ix) Seminar, World Mathematical Year, Dec.30, 2000, Department of Mathematics, HBTI, Kanpur.
- (x) International Conference on “Current Trends in Differential Equations and Dynamical Systems”, Dec.15-17, 2001, IIT Kanpur.
- (xi) Conference on Mathematics, Bharat Ganit Parishad, Nov.23-24, 2002 Lucknow University, Lucknow.
- (xii) International Symposium on “Nonlinear Analysis and Applications”, Jan.02-04, 2003, Organized by Indian Society of Nonlinear Analysts, Science City, Kolkata.
- (xiii) International Conference on Mathematical Biology, Feb.19-21, 2004, IIT Kanpur
- (xiv) Recent Developments in Biomathematics, Feb.14, 2005, IIT Roorkee.
- (xv) International Conference on Mathematical Modelling and Computer Simulation, Dec.12-15, 2006, LNMIIT, Jaipur
- (xvi) Symposium on Recent Advances in Mathematical Sciences, Feb.16-17, 2007, IIT Kanpur.
- (xvii) Invited to deliver an ‘Invited talk’ in the Third International Conference on Analytic Mathematics and its Applications, Xinyang Normal University, Xinyang-464000, Henan, P.R.China, Aug.08-12, 2011.
- (xviii) Invited to attend the BIT’s second Annual World AIDS Day (HIV-2011) , Parallel summit of 1<sup>st</sup> Annual World Congress of microbes-2011, Dec.1-3, Beijing, China
- (xix) Attended International Conference of Mathematical Modelling and Computer Simulation with Applications (ICMMCSA), IIT Kanpur , Dec. 31, 2013-Jan. 2, 2014 and delivered an invited talk on “ Modeling the removal of carbon dioxide from the atmosphere to reduce global warming”

### **SUMMER/WINTER SCHOOLS/WORKSHOPS ATTENDED**

- (i) Summer School on “Mathematical Modelling,” May 19-28, 1994, IIT, Kanpur.
- (ii) Short Term Course on “Reliability and Safety in Process Industries,” Sep. 28-Oct. 10, 1998, HBTI, Kanpur.
- (iii) Refresher Course on “Sobolev Spaces and its Applications” Dec. 3-20, 1998, IIT, Kanpur.
- (iv) Summer Course on “Probability, Random Processes and Elements of Information Theory”, June 14-26, 1999, IIT Kanpur.
- (v) UNESCO Regional Training Programme on “Mathematical Modelling of Fluid Flows, Diffusion and Environmental Pollution” March 12 – 24, 2001, IIT Kanpur.
- (vi) Short Term Training Programme on “Eco-Friendly Chemical Technologies”, March 11-24, 2002, HBTI Kanpur.
- (vii) Short Term Training Programme on “Intellectual Property Rights and Patent Information” conducted by Applied Science Department, National



- Institute of Technical Teachers Training and Research, Chandigarh, Sept.27-Oct.01, 2004 at HBTI Kanpur.
- (viii) Short Term Course on Mathematical Methods in Engineering and Science, July 3-15, 2006, IIT Kanpur.
  - (ix) Workshop on 'Pedagogy' Feb. 24, 2008, HBTI Kanpur.
  - (x) Workshop on Modeling and Simulation of Chemical Processes, Feb.24-28, 2009, HBTI Kanpur.
  - (xi) Workshop on Disaster Management and Mitigation, March 17-21, 2009, HBTI Kanpur.
  - (xii) AICTE-ISTE sponsored Short Term Training Programme on "Optimization Techniques for Engineers", March 23-28, 2009 HBTI Kanpur.
  - (xiii) Workshop on Curriculum Development and Evaluation Methods in Technical Education, July 1-6, 2013, HBTI Kanpur.
  - (xiv) Faculty Development Program on Modeling, Simulation and Analysis of Engineering Systems, Oct. 25-30, 2013, HBTI Kanpur
  - (xv) Workshop on State level Faculty Interaction Seminar under the aegis of Department of Technical Education, Govt. of U.P., June 8-9, 2015, H.B.T.I.Kanpur

#### **ADMINISTRATIVE/ EXTRA-CURRICULAR / CO-CURRICULAR ACTIVITIES**

- Senator, Students' Senate, 1989-90, 1990-91, IIT Kanpur.
- Student Representative, Department Post Graduate Committee (DPGC), 1989-90, 1990-91, Department of Mathematics, IIT Kanpur.
- Student Representative, Senate Post Graduate Committee (SPGC), 1990-91, IIT Kanpur.
- Member, Convocation Sub Committee, 1996-97, HBTI Kanpur
- Member, Antiragging Committee, 1997, 1999, 2000- 2007, 2008-09, 2009-20, 2010-11, 2011-12, 2012-13 HBTI Kanpur.
- Member, Selection Committee for Research Scholars, 2003-04, HBTI Kanpur.
- **Warden**, Lake View (New) Hostel, Nov. 2001- July 2004, HBTI Kanpur.
- **Warden**, West Campus Hostel II, Dec.2004 – July 2007, HBTI Kanpur.
- Member, Proctorial Board, 2003-04, HBTI Kanpur
- Member, Program Conduction Committee, Symposium on "Environmental Challenges for the New Millennium", Nov.24-25, 2000, Department of Chemical Engineering, HBTI Kanpur
- Member, Audio Video Committee, Conference on "Recent Development of Polymers", August 16-17, 2002, Department of Plastic Technology, HBTI Kanpur
- Expert Member, Lecturers Selection Committee in Mathematics, Kanpur Institute of Technology, Feb.29, 2004
- Subject Expert in Mathematics, U.P. Intermediate Education Services Selection Board, Allahabad, July 2-3, 2004.
- Expert Member, Guest Lecturers Selection Committee in Mathematics, Dr Ambedkar Institute of Technology for Handicapped, Feb.12, 2005.

- Expert Member, Guest Lecturers Selection Committee in Mathematics, HBTI Kanpur, Feb.14, 2005
- Expert Member, Guest Lecturers Selection Committee in Mathematics, HBTI Kanpur, Jan. , 2008, August 2008, August 2010, Jan.2011.
- Convener, Guest Lecturers selection committee in Mathematics, HBTI Kanpur, July 18, 2012
- Convener, Guest Lecturers selection committee in Mathematics, Dr. BRAECIT, Bijnore, July 19, 2012
- Convener, Guest Lecturer selection committee in Mathematics, HBTI Kanpur and Dr BRAECIT, Bijnore, Jan.02, 2013
- Convener, Guest Lecturers selection committee in Mathematics, HBTI Kanpur and Dr BRAECIT, Bijnore, July 18, 2013
- **Officer- in- Charge, Institute Guest House**, May 2007- April 2010, HBTI Kanpur.
- Member, Accommodation and Transportation Committee, IIIrd International Alumni Meet, Nov.24-25, 2007, HBTI Kanpur
- **Judge**, Uttar Pradesh and Uttaranchal Science level Exhibition, held at Puran Chandra Vidya Niketan Kanpur, Aug. 22, 2008.
- Expert member, Selection Committee (Mathematics), Sunrise Institute of Engineering Technology and Management, Unnao, , May 03, 2009,
- Expert member, Selection Committee (Mathematics), Eshan Institute of Engineering Technology and Management, Agra, May 08, 2009.
- Expert member, Selection Committee (Mathematics), P S Institute of Technology Kanpur, June 07, 2009.
- Member, Board of Studies (Mathematics), HBTI Kanpur, 2009
- **Assistant Superintendent**, UPTU Odd Semester Examination, 2009-10 at HBTI Kanpur
- Member, Accommodation and Transport Committee for Convocation 2009 held on March 16, 2010. HBTI Kanpur
- Expert member, syllabus modification committee of Mathematics I and II for Diploma courses, IRDT Kanpur, April 22, 2010
- Member, Accommodation and Transport Committee for Convocation 2010 held on Dec.18, 2010 HBTI Kanpur
- Member, Draft Committee for Convocation 2010 held on Dec.18, 2010 HBTI Kanpur
- Expert member, Selection Committee (Mathematics), Axis Institute of Technology Kanpur, Jan. 2012.
- **Head**, Department of Mathematics, HBTI Kanpur, March 23, 2012- March 23, 2015
- Member, Academic Committee, HBTI Kanpur, 2012
- Member, Academic Council, HBTI Kanpur, 2012
- **Chairman**, Board of Studies (Mathematics) 2012-2015
- Member, Syllabus Moderation Committee for Mathematics Courses in I. B. Tech., GBTU Lucknow 2012-13 (April 18, 2013)
- Subject expert, Ph.D. admission interview committee, UPTU Lucknow, Dec. 23, 2013

- Subject expert, Syllabus modification committee for Applied Mathematics I & II courses in polytechnics, IRDT Kanpur, Sept. 23, 2014
- **Assistant Dean**, Students' Welfare, Sept. 29, 2014 – Oct. 29, 2015 , HBTI Kanpur
- Member, Reception Committee, Workshop on State level Faculty Interaction Seminar under the aegis of Department of Technical Education, Govt. of U.P., June 8-9, 2015, H.B.T.I.Kanpur
- **Judge** in Science Exhibition at Kendriya Vidyalaya, Sarsaul, 2015
- **Convenor**, Screening Committee for promotion of employees from class four to class three ( Tech. grade), Jan. 2016, HBTI Kanpur