VITAE_Sandip Banerjee

NAME: Sandip Banerjee
Designation: Professor

PHONE: Mobile:+919410511782
Email: sandip.banerjee@ma.iitr.ac.in
sandipbanerjea@gmail.com

ADDRESS:
Home (present): B-502 Canal View Apartment, 39, Civil Lines, IIT Roorkee, Roorkee – 247667, Uttarakhand, India.

Office:
Department of Mathematics
Indian Institute of Technology, Roorkee
Roorkee – 247667, Uttarakhand, India.

DATE OF BIRTH:
October 19, 1969

CITIZENSHIP:
Indian

EDUCATION

- Ph.D. in Applied Mathematics, March 2001, University of Calcutta, India.
- Master of Science, Applied Mathematics, December 1993, University of Calcutta, First Class.
- Bachelor of Science, Mathematics (Honors), St. Xavier's College, August 1991, University of Calcutta, First Class.

RESEARCH INTEREST

- Mathematical modeling of interaction between tumor and immune system – the spatial aspect and its 3D visualization.
- Mathematical modeling of plankton dynamics in patchy stochastic environment.
- Mathematical modeling of infectious diseases.
- Mathematical modeling of Alhzeimer disease.

TEACHING INTEREST

Undergraduates:

- Vector algebra and vector calculus.
- Numerical methods.
- Probability and Statistics.
- Differential and integral calculus, Differential equations.
- Engineering Mathematics.

Graduates:

- Mathematical Modeling.
- Mathematical Biology.
- Numerical Analysis.
- Differential Equations.

PREVIOUS EXPERIENCES

A Research Experience

Duration	Organization	Area(s)
Feb 2005 – Jan 2007 (2 years), Post Doctoral Fellow.	Metapopulation Research Group University of Helsinki, Finland	Mathematical Biology, namely, Metapopulation Dynamics
Jan1996–Oct 1997 Senior Research Fellow (NET)	Department of Applied Mathematics, University of Calcutta, India.	Mathematical Biology, namely, Population Dynamics
Jan 1994–Dec 1995 Junior Research Fellow (NET)	Department of Applied Mathematics, University of Calcutta, India.	Mathematical Biology, namely, Population Dynamics.

B1 Teaching Experience

Duration	Organization	Area(s)
01.07.2008 – 22.10.2012 23.10.2012 – 09.08.2020 10.08.2020 – till date	Assistant Professor. Associate Professor, Professor, Indian Institute of Technology, Roorkee	Both Pure and Applied Mathematics
10.03.2007 – 30.06.2008 (1 year 3.5 months)	Assistant Professor, Birla Institute of Technology and Science (BITS), Pilani, Rajasthan, India.	
01.09.2000 – 31.01.2005 (4 years 5 months)	Senior Lecturer, St. Xavier's College 30, Park Street, Kolkata- 700016, India	
03.10.1997 – 31.08.2000 (2 years 11 months)	Lecturer, Chittaranjan College, Beniatola Lane, Kolkata, India	

PUBLICATIONS (PAPERS)

2023

1. Antima and Sandip Banerjee, Modeling the dynamics of leptospirosis in India, *Scientific Reports (Nature Portfolio)* (2023), 13:19791.

2. Arpita Mondal and Sandip Banerjee, Impact of critical eddy diffusivity on seasonal bloom dynamics of Phytoplankton in a global set of aquatic environments, *Scientific Reports (Nature Portfolio)* (2023), 13:17141.

3. Rajat Kaushik and Sandip Banerjee, Predator–prey ecological system with group defense and anti-predator traits of the preys: Synergies between two important ecological actions, *Mathematics Open* (2023) (2350008), https://doi.org/10.1142/S2811007223500086.

2022

1. Arpita Mondal and Sandip Banerjee, Effect of productivity and seasonal variation on phytoplankton intermittency in a microscale ecological study using closure approach, *Scientific Reports (Nature Portfolio)* (2022), 12:5939.

2. Sumana Ghosh and Sandip Banerjee, Delay induced interaction of humoral and cell mediated immune responses with cancer, *Theory in Biosciences* (2022) 141, 27– 40.

3.Subhas Khajanchi, Kankan Sarkar, and Sandip Banerjee, Modeling the dynamics of COVID-19 pandemic with implementation of intervention strategies, *European Physical Journal Plus* (2022) 137:129.

4. Rajat Kaushik and Sandip Banerjee, Predator-prey system with multiple delays: prey's countermeasure against juvenile predators in the predator-prey conflict, *Journal of Applied Mathematics and Computing* (2022), 68, 2235–2265.

2021

1. Rajat Kaushik and Sandip Banerjee, Predator–Prey System: Bachelor Herding of the Prey Imposes Ecological Constraints on Predation, *International Journal of Bifurcation and Chaos* (2021), 31(14), 2150211(1–25).

2. A. Pandey, P. Sah, S. Moghadas, S. Mandal, Sandip Banerjee, P.J. Hotez, and A.P. Galvani, Challenges facing COVID-19 vaccination in India: Lessons from the initial vaccine rollout, *Journal of Global Health* (2021), 11:03083.

3. Sarmistha Das, Pramit Ghosh, Sandip Banerjee, Saumyadipta Pyne, Joydev Chattopadhyay, Indranil Mukhopadhyay, Determination of critical community size from an HIV/AIDS model, *Plos one* (2021), 16(1): e0244543.

4. Rajat Kaushik and Sandip Banerjee, Predator-prey system: Prey's counter-attack on juvenile predators shows opposite side of the same ecological coin, *Applied Mathematics and Computation* (2021), 388, 125530.

2020

1. Teekam Singh and Sandip Banerjee, Spatiotemporal Dynamics of Immunogenic Tumors, *International Journal of Biomathematics* (2020), 13(5), 2050044:1-15.

2. Sumana Ghosh and Sandip Banerjee, Effects of Antibodies and Cytotoxic T-lymphocytes on Cancer: A Mathematical Study, *International Journal of Applied and Computational Mathematics* (2020), 6 (60), 1-19.

2019

1. Subhas Khajanchi and Sandip Banerjee, A strategy of optimal efficacy of T11 target structure in the treatment of brain tumor response, *Journal of Biological Systems* (2019), 27(2), 225-255.

2. Teekam Singh and Sandip Banerjee, Spatiotemporal model of a predator-prey system with herd behavior and quadratic mortality, *International Journal of Bifurcation and Chaos* (2019), 29(4), 1950049 (1-18).

2018

1. Teekam Singh and Sandip Banerjee, Spatial aspect of hunting cooperation in predators with Holling type II functional response, *Journal of Biological Systems* (2018), 26(4), 511–531.

2. Subhas Khajanchi and Sandip Banerjee, Influence of multiple delays in brain tumor and immune system interaction with T11 target structure as a potent stimulator, *Mathematical Biosciences* 302 (2018), 116–130.

3. Sandip Banerjee and Ram Keval, Influence of Intracellular delay on the dynamics of Hepatitis C virus, *International Journal of Applied and Computational Mathematics* (2018), 4:89. https://doi.org/10.1007/s40819-018-0519-5.

4. Sumana Ghosh and Sandip Banerjee, Mathematical modeling of cancer–immune system, considering the role of antibodies, *Theory in Biosciences* (2018), 137, 67–78.

2017

1. Subhas Khajanchi and Sandip Banerjee, Role of constant prey refuge on stage structure predator–prey model with ratio dependent functional response, *Applied Mathematics and Computation* (2017), 314, 193–198.

2. Subhas Khajanchi and Sandip Banerjee, Quantifying the role of immunotherapeutic drug T11 target structure in progression of malignant gliomas: Mathematical modeling and dynamical perspective, *Mathematical Biosciences* 289 (2017), 69–77.

2016

1. Sandip Banerjee, Ram Keval and Sunita Gakkhar, Global dynamics of Hepatitis C viral infection with logistic proliferation, *International Journal of Biomathematics* (February 16, 2016), 9 (4), 1– 25.

2015

1. Sandip Banerjee, Subhas Khajanchi and Swapna Chowdhuri, Mathematical model to elucidate brain tumor abrogation by immunotherapy with T11 target structure, *PLoS ONE* (2015) 10(5), 1 – 21.

2. Sandip Banerjee and Alexei Tsygvintsev, Stability and bifurcations of equilibria in a delayed Kirschner–Panetta model, *Applied Mathematics Letters* (February 2015), 40, 65 – 71.

2014

1. Subhas Khajanchi and Sandip Banerjee, Stability and bifurcation analysis of delay induced tumor immune interaction model, *Applied Mathematics and Computation*, (December 2014), 248, 652–671.

2. Alexei Tsygvintsev and Sandip Banerjee, Bounded immune response in immunotherapy described by delayed Kirschner-Panetta model, *Applied Mathematics Letters* (May 2014), 35, 90 – 94.

3. A. Priyadarshi , Sandip Banerjee and S. Gakkhar, Geometry of the Poincaré compactification of a four-dimensional food-web system, *Applied Mathematics and Computation* (January 2014), 226, 229 – 237.

2013

1. Sandip Banerjee, Ram Keval and Sunita Gakkhar, Modeling the dynamics of Hepatitis C Virus with combined antiviral drug therapy: Interferon and Ribavirin, *Mathematical Biosciences* (2013), 245, 235 – 248.

2. Shiferaw Feyissa and Sandip Banerjee, Delay-induced oscillatory dynamics in humoral mediated immune response with two time delays, *Nonlinear Analysis: Real World Applications* (2013), 14, 35 – 62.

2012

1. Ram Keval, Sandip Banerjee and S. Gakkhar, Dynamics of Hepatitis C virus (HCV) infection with Gompertzian proliferation, *Procedia Engineering* (2012) 38, 2453 – 2462.

2. S. Gakkhar, A. Priyadarshi and Sandip Banerjee, Role of protection in a Tritrophic Food Chain Dynamics, *Journal of Biological Systems* (2012), 20(2), 155 – 175.

3. A. Priyadarshi, S. Gakkhar and Sandip Banerjee, Dynamics of density dependent closure term in a simple plankton model, *Communications in Computer and Information Sciences* (2012), 283(1), 193–200.

4. S. Gakkhar, A. Priyadarshi and Sandip Banerjee, Complex Behavior in Four Species Food-Web Model, *Journal of Biological Dynamics* (2012), 6 (2), 440 – 456.

5. A. Priyadarshi, S. Gakkhar and Sandip Banerjee, Role of Density Dependent Protection in a Food Chain System, *International Journal of Mathematical Sciences and Applications* (2012), 2(1), 425 – 433.

6. S. Gakkhar, A. Priyadarshi and Sandip Banerjee, Fluctuating Nutrient Input in a Simple Plankton System, *Journal of Nonlinear Systems and Application*, (2012), 3(1), 10 –21.

2011

1. A. Priyadarshi, Sandip Banerjee and S. Gakkhar, Complex Dynamics of Plankton system with Hyperbolic and Sigmoidal Mortality of Zooplankton, *Review Bulletin of Calcutta Mathematical Society* (2011), 19(2), 225-236.

2010

1. Sandip Banerjee, R. Bhattacharyya and B. Mukhopadhyay, A stage structure predator prey model with two discrete time delays, *Journal of Applied Mathematics and Informatics* (2010), 28 (5), 1 – 13.

2. Siddhartha P. Chakrabarty and Sandip Banerjee, A control theory approach to cancer self remission aided by an optimal therapy, *Journal of Biological Systems* (2010), 18(1), 75 – 91.

2009

Nil

2008

1. Sandip Banerjee, Immunotherapy with Interleukin – 2: a study based on mathematical modeling, *International Journal of Applied Mathematics and Computer Science* (2008), 18 (3), 1 – 10.

2. B. Dubey, Uma S. Dubey and Sandip Banerjee, Modeling the interaction between avascular cancerous cells and acquired immune response, *Journal of Biological Systems* (2008), 16 (3), 337 – 356.

3. Sandip Banerjee and Ram Rup Sarkar, Delay induced model for tumor-immune interaction and control of malignant tumor growth, *Biosystems (2008),* 91 (1), 268-288.

Before 2008

1. Ramrup Sarkar, R. Bhattacharyya, B. Mukhopadhyay and Sandip Banerjee, Time lags can control algal blooms in two harmful phytoplankton-zooplankton system, *Applied Mathematics and Computation* (2007), 186, 445 −459.

2. M. Banerjee and Sandip Banerjee, A stage structured prey-predator model with discrete time delay, *Applied Mathematics and Computation* (2006), 182 (2), 1385-1398.

3. Ramrup Sarkar and Sandip Banerjee, Cancer self remission and tumor stability – a stochastic approach, *Mathematical Biosciences* (2005), 196, 65–81.

4. R. Bhattacharya, M. Banerjee and Sandip Banerjee, Stability and Bifurcation in a Diffusive Prey-predator System: Non-linear Bifurcation Analysis, *Journal of Applied Mathematics and Computing* (2002), 10, 17–26.

5. Sandip Banerjee, Rakhi Bhattacharya and C. G. Chakrabarti, Shift of Bifurcation Point due to Noise Induced Parameter, *International Journal of Mathematics and Mathematical Sciences* (2000), 23 (6), 435– 439.

6. Sandip Banerjee, A Stochastic Model of a Diffusive Prey-Predator System: Fluctuation and Stability; *Journal of Natural and Physical Sciences* (2000), 14, 37–48.

7. Sandip Banerjee and C. G. Chakrabarti, Non-Linear Bifurcation Analysis of Reaction-Diffusion Activator-Inhibitor System, *Journal of Biological Physics* (1999), 25, 23–33.

8. Sandip Banerjee and C. G. Chakrabarti, Stochastic Dynamic Modeling of Damped Lotka-Volterra System, System *Analysis Modeling and Simulation* (1998) 30, 1–10.

9. Sandip Banerjee and C. G. Chakrabarti, Stochastic model of Symmetric Lotka-Volterra Competition System: Non-equilibrium Fluctuation and Stability, *Bulletin of Calcutta Mathematical Society* (1996), 88, 235–244.

PUBLICATION (CONFERENCE)

1. Rajat Kaushik and Sandip Banerjee (2021) Predator–Prey System: Two Predators Feed on the Different Stages of a Single Prey. In: Saran V.H., Misra R.K. (eds) Advances in Systems Engineering. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-8025-3_27.

2. Rajat Kaushik and Sandip Banerjee (2020), Predator-Prey Model with Prey Group Defense and Non-linear Predator Harvesting. In: Manna S., Datta B., Ahmad S. (eds) Mathematical Modelling and Scientific Computing with Applications. ICMMSC 2018. Springer Proceedings in Mathematics & Statistics, vol 308. Springer, Singapore. https://doi.org/10.1007/978-981-15-1338-1_9.

3. Ram Reval and Sandip Banerjee (2017), Dynamics of Hepatitis C Viral Load with Optimal Control Treatment Strategy, In Rubem P Mondaini (Ed.), Mathematical Biology and Biological Physics, Proceedings of the International Symposium on Mathematical and Computational Biology (pp. 141-150), World Scientific Europe.

4. Sandip Banerjee (2015), Rich Dynamics of Hepatitis C viral Infection with logistic proliferation, In Rubem P Mondaini (Ed.), BIOMAT 2014, Proceedings of the

International Symposium on Mathematical and Computational Biology (pp. 221-231), World Scientific Europe.

5. Subhas Khajanchi and Sandip Banerjee (2013), Global stability of a tumor immune interaction model, Mathematical Sciences International Research Journal 2 (2), ISSN 2278 – 8697.

6. Ram Keval, Sandip Banerjee and S. Gakkhar (2012), Effect of Proliferation terms in the Dynamics of Hepatitis C Virus, Proceedings of the International Conference on Mathematical Modeling and Applied Soft Computing (pp. 727-735), Coimbatore, Conference Proceeding ISBN number: 978-81-923752-1-2.

7. A. Priyadarshi, S. Gakkhar and Sandip Banerjee (2012), Complexity to order: Protection in a tri-trophic Food Chain Dynamics, Annual International conference on Computational Mathematics, Computational Geometry and Statistics (pp. 55-59), Singapore, ISSN: 2251-1911.

8. S. Gakkar, A. Priyadarshi and Sandip Banerjee (2011), A Numerical Study of a Simple Plankton System with Fluctuating Nutrient Input, Proceedings of The National Workshop-Cum-Conference on Recent Trends in Mathematics and Computing (pp. 165-169), Bhiwani, Conference Proceeding ISSN number: 819039523X.

9. Ram Rup Sarkar and Sandip Banerjee, A time delay model for control of malignant tumor growth, In M. Lakshmanan and R. Sahadevan (eds.), Nonlinear Phenomena in Medical and Biological Sciences, Proceedings of the Third National Conference on Nonlinear Systems and Dynamics (pp. 223-226), Allied Publishers Pvt. Ltd.

PUBLICATIONS (BOOKS)

1. Mathematical Modeling: Models, Analysis and Applications, Second Edition, (Dec 7 2021), CRC Press, Taylor and Francis Group.

2. Mathematical Modeling: Models, Analysis and Applications (Feb 7 2014), CRC Press, Taylor and Francis Group.

3. Numerical Analysis and Computational Procedures (2006), Books and Allied Private Ltd, India.

4. Chapter in edited volumes: *Cancer self Remission and Tumor Instability as a prey predator System* in "Mathematical Biology - Recent Trends" , Editors Peeyush Chandra and B.V. Rathish Kumar, 2006., Anamaya Publications, pp 312 - 315, 2006.

5. Topics in Mathematics I: Numerical methods, Linear Programming, Probability and Statistics (2005), Books and Allied Private Ltd, India.

ADMINISTRATIVE WORK

Department level: Faculty in Charge Time-table, Faculty Advisor, Faculty in Charge Administration, Faculty in Charge Maintenance, Chairman, Department Research Committee, Faculty in Charge Computer Lab.

Institute level: Faculty in Charge Transport, Manager of Adarsh Bal Niketan (ABN) School.

AWARDS AND HONORS

1. Felicitated by Medal by Indo-US Technology Forum for his contribution in Indo-US Fellowship 2009 program at First Indo-US research Fellowship Conclave, Pune, 15-17 March 2013.

2. Indo-US Fellowship 2009. I have visited North Carolina State University, Raleigh to work with Prof. Hien Tran, Department of Mathematics for 3 months.

3. National Scholarship in the Bachelor of Sciences in 1991.

PROFESSIONAL MEMBERSHIP

1.	SIAM membership	Yearly
2.	Society for Mathematical Biology	Yearly
3.	Indian Statistical Institute	Life member
4.	The Indian Science Congress Association	Life Member

COLLABORATORS

1. Dr. Ram Rup Sarkar, National Chemical Laboratory Pune.

2. Dr. Siddhartha P. Chakrabarti, IIT Guwahati.

3. Dr. Alexei Tsygvintsev, University of Lyon, France.

4. Prof. Mostafa Adimy, INRIA Antenna Lyon la Doua, France.

5. Prof. Otso Ovaskainen, University of Helsinki, Finland.

WORK IN PROGRESS

1. (Arpita Mondal) Eco-friendly treatment strategy with algaecides in a micro-scale ecological study of phytoplankton bloom using moment closure method (submitted).

2. (Abiy Dejenee) Effect of Stochasticity on HCV Model with Interferon Therapy (submitted)

3. (Antima) Understanding the Dynamics and Drivers of Leptospirosis in Tropical and

Subtropical Regions: A Mathematical and Epidemiological Approach (submitted).

4. (Antima) Harmonizing Human and Animal Populations: Unraveling Dynamics in a Non-Autonomous Leptospirosis Model (under preparation).

REVIEWER

1. Mathematical Reviews/MathSciNet Reviewer.
2. Journal of Theoretical Biology.
3. Chaos, Solitons & Fractals.
4. Applied Mathematics and Computation.
5. Biosystems.
6. SIAM Journal on Applied Mathematics.
7. Scientific Reports.
8. Plos One
9. Mathematical Biosciences

ORGANIZATION OF WORKSHOPS/CONFERENCES/SEMINARS

- Event organizer of High-end workshop on Mathematical Modeling and Dynamical Systems with applications using Mathematica and Matlab, in the Department of Mathematics, from July 11-July 18, 2022, funded by Accelerate Vigyan, SERB, India.

- Convener of the workshop titled MATHEMATICA as a teaching aid under Technical Education Quality Improvement Programme III (TEQIP III) from June 10–14, 2019 in the Department of Mathematics, IIT Roorkee.

- Convener of the workshop titled Micro-scale variability and planktonic ecosystem models on January 20, 2017 in the Department of Mathematics, IIT Roorkee in association with Department of Ocean Sciences, Tokyo University of Marine Science and Technology.

- Convener of the workshop titled MATHEMATICA as a teaching aid under Technical Education Quality Improvement Programme (TEQIP) from March 10–12, 2016 in the Department of Mathematics, IIT Roorkee.

- Chairman and Convener of BIOMAT 2015, International Symposium on Mathematical and Computational Biology from November 2–6, 2015 in the Department of Mathematics, IIT Roorkee.

- Convener of Indo-Canadian Workshop on the Mathematical Modeling of Infectious Diseases from January 20–22, 2014 in the Department of Mathematics, IIT Roorkee.

INVOLVEMENT IN COURSE DEVELOPMENT

- Course developer (Numerical Analysis) in National Program on Technology enhanced learning (NPTEL phase II).
- Course developer (Differential equations and Special functions) in e-PG pathshala, a MHRD project.

SPONSORED PROJECTS

Period	Sponsoring Organization	Title of Project	Amount of Grant	Co-Investigators (if any)
3 years 2023-2026	Science and Engineering Research Board (SERB)	Epidemiology of Leptospirosis in India-a study based on Mathematical Modeling.	Rs. 6,60,000.00	
2 years 2020-2022	Canadian Institute of Health Research	Evaluation of Intervention Strategies in Response to the COVID-19 Outbreaks	$29,200 (Canadian Dollars)	Prof. Sayed Moghadas, York University, Canada. (Completed)
3 years 2018-2021	Science and Engineering Research Board (SERB)	Mathematical modeling of Phytoplankton dynamics with highly irregular distribution.	Rs. 19,032,00.00	Completed
(2 years) April 1 2015 - 31st March 2017.	Indo French Center for Applied Mathematics	Mathematical Models in Biology: Dynamics Systems Approach.	Euro 12444 approved for two years.	Alexei Tsygvintsev, Unit of Pure and Applied Mathematics, Lyon, France. (Completed)
(1 year) April 1 2014 - 31st March 2015.	Indo French Center for Applied Mathematics	Mathematical Modeling of Tumor-Immune Interaction considering the role of antibodies.	Euro 5022	Alexei Tsygvintsev, Unit of Pure and Applied Mathematics, Lyon, France. (Completed)
1 year Jan1 2013 - Dec 31st 2013	Indo French Center for Applied Mathematics	Theoretical and numerical study of Kirschner-Panetta equations in immunotherapy of cancer.	Euro 5800	Alexei Tsygvintsev, Unit of Pure and Applied Mathematics, Lyon, France. (Completed)

3 years (October 11 - March 15)	DST	Mathematical Modeling of Malignant Brain Tumor with T11 Target Structure as a Potent Immune Stimulator	Rs. 21,39,360.00	Completed
23.10.08 to 22.10.11 (3 years)	IIT Roorkee	Optimally controlled treatment strategy using Interferon and Ribavirin for Hepatitis C Virus.	Rs. 3,21,900.00	Completed

PH. D. GUIDANCE

Year	No. of Students in Hand	No. of Students Registered	No. of Ph. Ds Completed	Placement of the student
2008-2009	03	03	00	NA
2009-2010	03	03	00	NA
2010-2011	03	03	00	NA
2011-2012	02	02	01 **Thesis title:** Role of Antibodies: A Paradigm in Mathematical Modeling for Cancer Treatment.	Shiferaw F. Balcha, Dean, Adama Science and Technology University, Ethiopia.
2012-2013	01+02	03	01 **Thesis title:** Complex Behavior in Four Species Food-Web Model. (jointly with Prof. Sunita Gakkhar)	Anupam Priyadarshi, Assistant Professor, Department of Mathematics, Benaras Hindu University.
2013-2014	03+01	04	00	NA
2014-2015	03	03	01 **Thesis title:** Mathematical Modeling of Hepatitis C Viral Kinetics (jointly with Prof. Sunita Gakkhar)	Ram Keval Department of Applied Sciences Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh.
2015-2016	02+01	03	01 **Thesis title:** Mathematical Modeling of Malignant Brain Tumor with T11 Target Structure	Subhas Khajanchi Department of Mathematics, Presidency University, Kolkata.
2016-2017	02+01	03	01 **Thesis title:** Mathematical models of humoral and cell mediated immune responses	Sumana Ghosh Research Assistant Professor, SRM Institute of Science

			– a comparative study.	and Technology, Chennei.
2017-2018	02	02	01 **Thesis title:** Spatial aspects of some tumor-immune and ecological models.	Teekam Singh Faculty, Department of Computer Science and Engineering, Graphic Era University Dehradun
2018-2019	02+01	03	00	
2019-2020	03+01	04	00	
2020-2021	03+01	04	01 **Thesis title:** Mathematical models on predator-prey dynamics: Role and Ecological consequences of various anti-predator adaptations	Rajat Kaushik Assistant Professor Regional Institute of Education, NCERT, Bhopal.
2021-2022	04	04		
2022-2023	03+01	04	**01** **Thesis title:** Modeling the dynamics of Marine Ecosystem using moment closure method.	Arpita Mondal Postdoctoral research fellow, Deutsch Lab University of Haifa

SEMINARS / WORKSHOPS /TALKS

1. Invited speaker at International Conference of Advancements in Mathematics, organized by the School of Mathematics, Thapar Institute of Engineering & Technology, Patiala (September 29-30, 2023).

2. Invited talk organized by the Research Club at Department of Mathematics, DIT University, Dehradun (September 22, 2023).

3. Contributed talk at International Congress of Industrial and Applied Mathematics (ICIAM 2023), Tokyo, Japan (August 20 – August 25, 2023).

4. Invited speaker at National Conference on Recent Trends in Mathematical Biology - Theory, Methods and Applications, organized by Department of Mathematics and Computer Science, Sri Sathya Sai Institute of Higher Learning, Andhra Pradesh (July 20 – July 22, 2023).

5. Resource person for High-End Workshop On Bifurcations and Chaos: Computations and Applications organized by Department of Mathematics, IIT Indore (July 7-8, 2023).

6. Keynote speaker at National Conference on Mathematical Modeling, Analysis and Computation (NCMMAC-2023), Department of Mathematics, RGNIYD, an Institute of National Importance, Ministry of Youth Affairs and Sports, Govt. of India (June 6-7, 2023).

7. Invited talk at Department of Mathematics, Presidency University, Kolkata (March 14, 2023).

8. Invited talk at the Department of Mathematics, Aliah University, Newtown, West Bengal (March 14, 2023).

9. Keynote speaker at National Conference on Mathematics: Various Aspects in Society organized by the Department of Mathematics, Jadavpur University, Kolkata (March 13, 2023).

10. Resource person (Webinar) for Refresher Course on Mathematics, Statistics and Computer Science, organized by UGC-Human Resource Development Centre, University of Lucknow (Jan 12-13, 2023).

11. Keynote speaker at International Conference on Modern Mathematical Methods and High Performance Computing in Science & Technology (M3HPCST-2022) organized by Motherhood University, Roorkee, Uttarakhand (December 22-24, 2022).

12. Resource person for Faculty Development Programme on Recent Advances in Applied Mathematics Using Mathematical Tools (RAAMMT-2022) organized by Department of Mathematics & Scientific Computing, Madan Mohan Malaviya University of Technology, Gorakhpur (December 14, 2022).

13. Resource person (Webinar) for Workshop on Nonlinear Phenomena in Mathematical Biology organized by the Department of Applied Sciences, ABV-IIITM Gwalior (December 19, 2022).

14. Keynote speaker for National seminar on Dynamical Systems and its applications organized by the Department of Mathematics, St. Xavier's College (Autonomous), Kolkata (February 22, 2022).

15. Resource person for Training and Workshop on Mathematical Biology organized by Department of mathematics, University of Kalyani, West Bengal (February 19-20, 2022).

16. Resource person (Webinar) for faculty development program on Computational Mathematics and Recent Advances in Management Principles organized by Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur (Nov 17, 2021).

17. Resource person (Webinar) for faculty development program on Mathematical Tools and Recent Advances in Applied Mathematics (MTRAAM-2021) organized by Department of Mathematics and Scientific Computing, Madan Mohan Malaviya University of Technology, Gorakhpur (U.P) (Aug 16, 2021).

18. Resource person (Webinar) for Refresher Course on Computational Mathematics organized by Human Resource Development Centre (HRDC), Dr. Harisingh Gour Central University, M.P. (March 4, 2021).

19. Invited talk (Webinar) for National Mathematical Modelling Symposium organized by Pandit Deendayal Petroleum University and BITS Pilani (Feb 14, Feb 21, 2021).

20. Resource person (Webinar) for Online Refresher Course in Mathematics organized by Human Resource Development Centre (HRDC), Pandit Ravishankar Shukla University (PRSU), Raipur (Dec 11, 2020).

21. Invited talk (Webinar) titled A Mathematical Model to Elucidate Brain Tumor Abrogation by Immunotherapy with T11 Target Structure organized by Centre for Mathematical Sciences (CMS), University Tunku Abdul Rahman (UTAR), Malaysia (Nov 23, 2020).

22. Resource person (Webinar) for faculty development program on Mathematical Tools and Recent Advances in Mathematics (MTAM-2020) organized by Department of Mathematics and Scientific Computing, Madan Mohan Malaviya University of Technology, Gorakhpur (U.P) (Sep 21, 2020).

23. Invited talk (Webinar) on Mathematical Modelling of Natural Phenomena, organized by The Assam Academy of Mathematics and Jawaharlal Nehru College, Assam (Aug 28, 2020).

24. Invited talk (Webinar) on Machine Learning and Mathematical Modeling: Shaping the future, organized by Department of Mathematics and Statistics, Manipal University Jaipur (Aug 07, 2020).

25. Invited talk titled Modeling the dynamics of Hepatitis C Virus with combined antiviral drug therapy: Interferon and Ribavirin at International Conference on Mathematical Sciences and Application (ICMSA 2020), Department of mathematics, University of Kalyani, West Bengal (Feb. 26- Feb. 28, 2020).

26. Chief Guest and Resource person for workshop on Mathematical Modeling and Simulation organized by Department of Mathematics, J. C. Bose University of Science and Technology, YMCA, Faridabad (Jan 28, 2020).

27. Keynote speaker at National Conference on emerging trends in Mathematics with computer applications (ETMCA-19), N.G.P Arts and Science College, Coimbatore (Sep 11-13, 2019).

28. Contributed talk titled Mathematical modeling of humoral and cell mediated immune responses to cancer at International Congress of Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain (July 14 – July 19, 2019).

29. Keynote speaker at National Seminar on Quality Assurance in the age of Information Explosion, B.K.C. College, Kolkata, affiliated to the West Bengal State University (July 05, 2019).

30. Resource person for TEQIP-III sponsored National workshop on Mathematica as a teaching aid organized by Department of Mathematics, IIT Roorkee (June 10 – 14, 2019).

31. Resource person for TEQIP-III sponsored National Conference on Recent Advances in Mathematics and Scientific Computing organized by Madan Mohan Malaviya University of Technology, Gorakhpur (April 5 – 6, 2019).

32. Resource Person for Analytics and Optimization for Business and Engineering organized by Manipal University Jaipur (Feb 25-March 01, 2019).

33. Resource Person for IFCAM (Indo French Center for Applied Mathematics) Summer School on Mathematical and Computational Biology organized by Indian Institute of Science, Bangalore (July 19 – 20, 2018).

34. Mini-Symposium speaker, talk titled A strategy of optimal efficacy of T11 target structure in the treatment of brain tumor at The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan (July 5 - July 9, 2018).

35. Invited talk at National Seminar on Mathematics and Applications - 2018 (NSMA-2018), organized by Department of Mathematics, University of Kalyani (Feb 22-23, 2018).

36. Keynote speaker at National Training Programme on The Art of Mathematical Modeling as Teaching Pedagogy, organized by St. Aloysius College (Autonomous), Jabalpur (Feb 9-10, 2018).

37. Keynote speaker, talk titled Mathematical Modeling of Cancer Immune system with Humoral and Cell Mediated Immune Responses at BIOMAT 2017, Institute of Numerical Mathematics, Russian Academy of Sciences, Moscow, Russia (October 30 - November 3, 2017).

38. Resource Person for Hands-on workshop on public health analytics and disease modeling at Dept. of Anthropology, NEHU, Shillong, Meghalaya, organized by Indian Statistical Institute, Kolkata (May 02 – 05, 2017).

39. Visited Unit of Pure and Applied Mathematics, Lyon (ENS Lyon), France for scientific collaboration with Dr. Alexei Tsygvintsev, under the project titled Mathematical Models in Biology: Dynamics Systems Approach funded by Indo French Center for Applied Mathematics (IFCAM) (22^{nd} March-29^{th} March , 2017).

40. Resource Person for the workshop titled Advances in Stability Analysis on Dynamical Systems under TEQIP II from 8th March, 2017 to 12th March, 2017 at the Department of Mathematics, NIT Silchar Assam.

41. Invited talk titled Sensitivity Analysis and Parameter Estimation in a Brain Tumor Model at Recent Advances in Computational Mathematics, Department of Applied Mathematics, University of Calcutta (December 27 - 29, 2016).

42. Visited Department of Ocean Sciences, Tokyo University of Marine Science and Technology for scientific collaboration with Prof. Hide Yamazaki on Phytoplankton (December 3 - 13, 2016).

43. Keynote speaker, talk titled Sensitivity Analysis and Parameter Estimation in a Brain Tumor Model at BIOMAT 2016, Chern Institute of Mathematics, Nankai University, Tianjin, China (October 30 - November 5, 2016).

44. Invited talk titled Mathematical model to elucidate brain tumor abrogation by immunotherapy with T11 target structure at Indo-UK initiative in Applied Mathematics workshop on Mathematics and Statistics of Biological Populations at Chail, organized by Prof. Somdatta Sinha, IISER Mohali (May 23-May 28, 2016).

45. Invited talk titled Influence of Intracellular Delay on the Dynamics of Hepatitis C Virus at Advances in Mathematical and Computational Biology, IIT Ropar, India (May 21 – May 22, 2016).

46. Mini-Symposium speaker, talk titled Mathematical Modeling of Malignant Brain Tumor with Immunostimulatory glycoprotein T11 target structure at International Congress of Industrial and Applied Mathematics (ICIAM 2015), Beijing, China (August 10 – August 14, 2015).

47. Invited Talk titled Mathematical model to elucidate brain tumor abrogation by immunotherapy with T11 target structure at International Conference on Mathematical and Computational Biology, IIT Kanpur, India (February 28-March 3, 2015).

48. Invited talk titled Rich Dynamics of Hepatitis C viral infection with logistic proliferation at BIOMAT 2014, Stefan Banach International Mathematical Centre, Institute of Mathematics, Polish Academy of Sciences, Bedlewo near Poznan, Poland (November 2-8, 2014).

49. Talk titled Mathematical Modeling of Malignant Brain Tumor with T11 Target Structure as a Potent Immune Stimulator at SIAM Conference on Life Sciences (LS14), Charlotte, North Carolina, USA (August 4-7, 2014).

50. Visited Unit of Pure and Applied Mathematics, Lyon (ENS Lyon), France for scientific collaboration with Dr. Alexei Tsygvintsev, under the project titled Mathematical Modeling of Tumor-Immune Interaction considering the role of antibodies funded by Indo French Center for Applied Mathematics (IFCAM) (3rd June - 17th June, 2014).

51. Mini-Symposium speaker, talk titled Parameter Estimation and Sensitivity Analysis of a Mathematical Model of a Tumor Immune System considering the Role of Antibodies at Applied Inverse Problem Conference organized by Korea Advanced Institute for Sciences and technology, Daejeon, Korea (July 1^{st} - 5^{th} , 2013).

52. Invited talk titled Influence of Intracellular Delay on the Dynamics of Hepatitis C Virus at University Pierre and Marie Curie, Institute of Mathematics, Paris, France (June 14th, 2013).

53. Visited Unit of Pure and Applied Mathematics, Lyon (ENS Lyon), France for scientific collaboration with Dr. Alexei Tsygvintsev, under the project titled Theoretical and numerical study of Kirschner-Panetta equations in

immunotherapy of cancer funded by Indo French Center for Applied Mathematics (IFCAM) (2nd June - 21st June, 2013).

54. Invited talk titled Modeling the dynamics of Hepatitis C Virus with combined antiviral drug therapy: Interferon and Ribavirin at National Seminar on the Recent Trends in Mathematics organised by University of Kalyani, West Bengal (7-8 March, 2013).

55. Invited talk titled Dynamics of Hepatitis C virus (HCV) infection with Gompertzian proliferation at the workshop organized by Indo-French Centre for Applied Mathematics, Nice, France (November 19 - 21, 2012).

56. Keynote speaker, talk titled Global Stability of Mathematical Model of Hepatitis C Virus at the National Conference on Modeling, Computational Fluid Dynamics and Operation Research organized by BITS Pilani (February 4^{th} – 5^{th} , 2012).

57. Mini-Symposium speaker, talk titled Model Development, Parameter estimation and Validation at International Conference on Theoretical and Mathematical Biology jointly organized by The Society for Mathematical Biology, IISER Pune and Center for Mathematical Biology at IISER Pune (January 23^{rd} – 27^{th}, 2012).

58. Invited talk at Recent Advances in Industrial and Applied Mathematics, organized by IIT Bombay in Collaboration with the Department of Mathematics at University of Birmingham, UK (November 4^{th} -6^{th}, 2011).

59. Talk titled Rich Dynamics of Hepatitis C viral infection with logistic proliferation at the conference Mathematical and Theoretical Ecology 2011: Linking models with ecological processes organized by University of Essex, UK (September 19^{th} – 21^{st}, 2011).

60. Invited talk at International Conference on Mathematical Biology jointly organized jointly by DST Centre for Mathematical Biology and Indian Institute of Science, Bangalore (July 4^{th} – July 7^{th}, 2011).

61. Resource person at Study Group Meeting on Industrial Problems (SGMIP – 2011), organized by Supercomputer Education and Research Centre (SERC), Indian Institute of Science (IISc), Bangalore and Industrial Mathematics Group (IMG), Indian Institute of Technology Bombay (IIT B), in collaboration with Oxford Centre for Collaborative Applied Mathematics (OCCAM), University of Oxford, United Kingdom (March 14-19, 2011).

62. Invited talk at National Conference on Theoretical Biology and Biomathematics (NCTBB 2010) organized jointly by Centre for Mathematical Biology and Ecology, Department of Mathematics, Jadavpur University, Kolkata and Biomathematical Society of India (15-16^{th} December, 2010).

63. Invited talk at Symposium on Mathematical Ecology organized jointly by Indian Institute of Science Education and Research (IISER-Kolkata) and DST Centre for Mathematical Biology (13-14^{th} December, 2010).

64. Invited talk at International Conference on recent development in Mathematical Sciences and their Applications (ICRDMSA 2010) organized by Calcutta Mathematical Society (11th December, 2010).

65. Resource person at Workshop on Mathematical Ecology organized jointly by Indian Institute of Science Education and Research (IISER-Kolkata) and DST Centre for Mathematical Biology (10th December, 2010).

66. Invited talk at National Seminar titled Differential Equations and Mathematical Modeling, organized by Mathematics Department, Lady Shri Ram College for Women, University of Delhi (September 9th , 2010).

67. Invited talk at Laboratory of Applied Mathematics, University of Pau and Pays de l'Adour, Lyon, France (3rd March, 2010).

68. Invited talk at Unit of Pure and Applied Mathematics, Lyon, France (March 1st 2010).

69. Invited talk at Symposium on Theoretical and Mathematical Biology organized by IISER Pune, CCMB Hyderabad and NCL Pune (October 10-11, 2009).

70. Invited talk at National Conference on Mathematical Modeling and Simulation jointly by Jiwaji University, Gwalior and ABV-Indian Institute of Information Technology & Management, Gwalior (January 9 – 11, 2009).

71. Invited talk at Department of Mathematics, IIT Guwahati, India (March13, 2008).

72. International Biomedical Modeling School and Workshop, organized by the Centre for Applicable Mathematics, TIFR, Bangalore, India (Feb27 – Mar02, 2008).

73. Talk titled "*Delay induced model for tumor-immune interaction and control of malignant tumor growth"* at Indian Institute of Technology, Kanpur, India (24th August, 2007).

74. Refresher Course on "*Advances in Biophysics"*, Centre of Cellular and molecular Biology, Hyderabad, India (25th May – June 8th , 2007).

75. Talk titled "*A time delay model for malignant tumor growth"* at Tata Institute of Fundamental Research (TIFR), Bangalore, India (21st November, 2006).

76. Talk titled "*Spatial Ecology"* at the Department of Civil Engineering, University of Glasgow, Scotland, UK (18th September, 2006).

77. Talk titled *"Modeling tumor-immune interactions and control of malignant tumor growth - a study based on time delay effect"* at the Faculty of Veterinary Medicine, University of Glasgow, Scotland, UK (11th September, 2006).

78. Talk titled *"Modeling tumor-immune interactions and control of malignant tumor growth - a study based on time delay effect"* at the Department of Mathematics, University of Dundee, Scotland, UK (30th August, 2006).

79. *SIAM Conference on the Life Sciences* (July 31-August 4, 06), Brownstone Hotel and Conference Center1707 Hillsborough Street Raleigh, North Carolina, to present a paper.

80. *CM06 Workshop III: Angiogenesis, NeoVascularization and Morphogenesis* (May 8-12, 2006) organized by Institute for Pure and Applied Mathematics (IPAM) situated on the University of California, Los Angeles campus.

81. Workshop on Spatial Ecology (March 13-17, 2006) organized by Lou Gross, Claudia Neuhauser, Chris Cosner, and Mark Kot, Mathematical Biosciences Institute (MBI), Ohio State University.

82. Talk at the Department of Applied Mathematics, University of Leeds (16th January, 2006) on "Effect of delay on malignant tumor".

83. Workshop entitled "Mathematical Modeling in Medicine" organized by Prof. Brian Sleeman, Department of Applied Mathematics, University of Leeds.

84. Workshop on Mathematical Biology (19th December, 2005), organized by Biomathematics Research Group, spearheaded by Prof. Mats Gyllenberg, Department of Mathematics, University of Helsinki.

85. International Seminar on Mathematical Biology (February, 2004) organized by Prof. Piyush Chandra, Head, Department of Mathematics, Indian Institute of Technology, Kanpur, India.

86. Talk (February 2002) entitled "Non-Linear bifurcation Analysis of Reaction-Diffusion Activator-Inhibitor System" at the Biomathematical Research Group, University of Turku, Finland.