

Dr. Tridip Sardar

Current Designation: **Assistant Professor (Stage-II)**

Department: **Mathematics**

Date of Joining: **14/03/2017**

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1. Academic Qualifications

Degree	Institution	Year	Subject/Discipline
M.Sc. in Mathematics	Indian Institute of Technology-Kanpur	2008	Mathematics
Ph.D. in Applied Mathematics	University of Calcutta (Work done in Indian Statistical Institute-Kolkata)	2015	Mathematical Epidemiology

2. Thesis Title

Ph.D./M.Phil Thesis Title: **Models and Data Based Studies On Two Important Communicable Diseases: Cholera and Dengue**

3. Specialization and Area of Interests

Specialization: **Ordinary Differential Equations, Numerical Analysis**

Area of Interests: **Modelling Infectious Diseases, Mathematical Biology, Fractional order differential equations and its applications in Ecology & epidemiology, Numerical Analysis**

4. Teaching Responsibilities: **CBCS Courses (C.U.):** CC-1 (Sem-1)[Calculus, Geometry & Vector Analysis], CC-3 (Sem-2) [Real Analysis], SEC-A (Sem-3) [C Programming Language], SEC-B (Sem-4) [Scientific Computing with SageMath], DSE-B1 (Linear Programming and Game Theory), CC-14 & CC-14 (practical)[Numerical Methods].

CCF Courses (C.U.): SEC-1.1 (C Language with Mathematical Applications) [Sem-1], SEC-2.2 (Python Programming and Introduction to Latex) [Sem-2], SEC-3.3 (Linear Programming & Rectangular Games) [Sem-3].

5. Research Project(s)

Title	Funding Agency	Role	Duration	Status
Mathematical and Statistical Analysis of Memory Effect in Disease Transmission- A fractional Calculus Approach	DST-SERB	Principal Invigilator	36 Months	Completed
Multi-scale seamless prediction of arboviral outbreaks in Thailand (ARBOTHAI)	welcome-grant	Mathematical Modelling Consultant in Barcelona Institute for	12 Months	Completed

		Global Health Foundation		
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6. Publications

a. Research Papers in Journals

1. Sardar, T., Nadim, S. S., & Rana, S. (2023) Detection of multiple waves for COVID-19 and its optimal control through media awareness and vaccination: study based on some Indian states. *Nonlinear Dynamics*, 111(2), 1903-1920
2. Sk, T., Biswas, S., & Sardar, T. (2022) The impact of a power law-induced memory effect on the SARS-CoV-2 transmission. *Chaos, Solitons & Fractals*, 165, 112790
3. Sardar, T. and Rana, S. (2021) Effective Lockdown and Role of Hospital-Based COVID-19 Transmission in Some Indian States: An Outbreak Risk Analysis. *Risk Analysis* (Accepted) , DOI: <https://doi.org/10.1111/risa.13781>
4. Rana, S., Bhowmick, A.R., & Sardar, T. (2021) Invasive dynamics for a predator–prey system with Allee effect in both populations and a special emphasis on predator mortality. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 31, 033150.
5. Sardar, T., Nadim, S.S., Rana, S., & Chattopadhyay, J. (2020). Assessment of lockdown effect in some states and overall India: a predictive mathematical study on COVID-19 outbreak. *Chaos, Solitons & Fractals*, 139, 110078.
6. Sardar, T., Ghosh, I., Rodó, X., & Chattopadhyay, J. (2020). A realistic two-strain model for MERS-CoV infection uncovers the high risk for epidemic propagation. *PLOS Neglected Tropical Diseases*, 14(2), e0008065.
7. Johansson, M. A., Apfeldorf, K. M., Dobson,....Sardar, T.,...& Yamana, T. K. (2019). An open challenge to advance probabilistic forecasting for dengue epidemics. *Proceedings of the National Academy of Sciences (PNAS)*, 116(48), 24268-24274.
8. Senapati, A., Sardar, T., Ganguly, K. S., Ganguly, K. S., Chattopadhyay, A. K., & Chattopadhyay, J. (2019). Impact of adult mosquito control on dengue-

- patch setting: A case study in Kolkata (2014–2015). *Journal of Theoretical Biology*, 478, 139-152.
9. Bhowmick, A. R., Sardar, T., & Bhattacharya, S. (2019). Estimation of growth regulation in natural populations by extended family of growth curve models with fractional order derivative: Case studies from the global population dynamics database. *Ecological Informatics*, 53, 100980.
 10. Senapati, a., Sardar, T., & Chattopadhyay, J. (2019). A cholera metapopulation model interlinking migration with intervention strategies—a case study of Zimbabwe (2008–2009). *Journal of Biological Systems*, 27(02), 185-223.
 11. Ghosh, M. K., Sardar, T., Cao, X., & Roy, P. K. (2018). Mathematical study of a memory induced biochemical system. *IEEE/CAA Journal of Automatica Sinica*, 5(6), 1142-1149.
 12. Ghosh, I., Sardar, T., & Chattopadhyay, J. (2017). Mathematical Study to Control Visceral Leishmaniasis: An Application to South Sudan. *Bulletin of Mathematical Biology* 79(5), 1100-1134.
 13. Sardar, T. & Saha, B. (2017). Mathematical analysis of a power-law form time dependent vector-borne disease transmission model *Mathematical Biosciences* 288: 109-123.
 14. Ghosh, K.; Sardar, T; Biswas, S; Samanta, S, & Chattopadhyay, J. (2016). An eco-epidemiological model with periodic transmission. *Nonlinear Studies* 23(3): 345-363.
 15. Sardar, T, Biswas, S., & Chattopadhyay, J. (2016). Global analysis of a periodic epidemic model on cholera in presence of bacteriophage. *Mathematical Methods in the Applied Sciences* 39: 4181–4195.

16. Sardar, T, Sasmal, S., & Chattopadhyay, J. (2015). Estimating dengue type reproduction numbers for two provinces of Sri Lanka during the period 2013-14. *Virulence* 7:2, 1-14. Doi:10.1080/21505594.2015.1096470
17. Alquran, M, Al-Khaled, K, Sardar, T, & Chattopadhyay, J. (2015). Revisited Fisher's Equation in a new outlook: A fractional derivative approach. *Physica A* 438: 81–93.
18. Sardar, T., Rana, S., Bhattacharya, S., Al-Khaled, K., & Chattopadhyay, J. (2015). A generic model for a single strain mosquito-transmitted disease with memory on the host and the vector *Mathematical Biosciences* 263: 18-36.
19. Sardar, T, Rana, S, & Chattopadhyay, J. (2014). A mathematical model of dengue transmission with memory *Communications in Nonlinear Science and Numerical Simulation* 22: 511–525.
20. Sardar, T, Mukhopadhyay, S., Bhowmick, A.R., & Chattopadhyay, J. (2013). An Optimal Cost Effectiveness Study on Zimbabwe Cholera Seasonal Data from 2008–2011 *PLoS ONE* 8(12): e81231. doi:10.1371/journal.pone.0081231
21. Greenhalgh, D., Rana, S., Samanta, S., Sardar, T, Bhattacharya, S., & Chattopadhyay, J. (2014). Awareness programs control infectious disease - multiple delay induced mathematical model *Applied Mathematics and Computation*. 251, 539–563.
22. Sardar, T., Ray, S.S., Bera, R.K., & Biswas, B.B. (2010). The solution of coupled fractional neutron diffusion equations with delayed neutrons *International Journal of Nuclear Energy Science and Technology* 5 (2), 105-113.
23. Sardar, T., Ray, S.S., Bera, R.K., Biswas, B.B. (2009). The analytical approximate solution of the multi-term fractionally damped Van der Pol equation. *Physica Scripta* 80(2) 025003.

b. Book chapters

Implicit Numerical Schemes Based on the Lower Incomplete Gamma Function for Solving a Class of Nonlinear Fractional-Ordinary Differential Equation Problems Arising from a Stochastic Process. **Proceedings of the 2nd International Conference on Nonlinear Dynamics and Applications (ICNDA 2024)**, Volume 2, Complex Systems, Fractals and Nonlinear Flows. **Springer Proceedings in Physics (Book Series)**

7. Invited Lectures

Title of Lecture	Event	Organizing Institution	Date
Mathematical Perspective of Epidemic Outbreak with Special Focus on COVID-19	Online Faculty Development Program, from March 18-22, 2021	Department of Basic Science and Humanities, IIIT Bhagalpur	March 18-22, 2021
A power- law form time dependent vector-borne disease transmission model	International conference on new paradigms in statistics for scientific and industrial research	Indian Association for Productivity, Quality & Reliability	January 4-6, 2018

9. Conferences/Seminars/Symposia/Workshops Attended

Name of Event	Role (Participant/Presenter/Organizer)	Date	Venue

National Conference on “Mathematical and Theoretical Biology (NCMTB-2017)	Presenter	March 16-17, 2017	Department of Mathematics, Jadavpur University
Workshop on R-Programming for students and researchers	Participant	September 16-17, 2014	Agricultural and Ecological Research Unit, Indian Statistical Institute Kolkata
3rd International Symposium on Complex Dynamical Systems and Applications	Presenter	March 10 – 12, 2014	Mathematics Unit, Indian Statistical Institute, Kolkata
India Biodiversity meet-2013	Presenter	March 14 – 16, 2013	Agricultural and Ecological Research Unit, Indian Statistical Institute Kolkata in collaboration with Bio-

			mathematical Society of India.
Emerging Trends in Mathematics	Presenter	December 19-20, 2012	Vidyasagar University, Midnapore, West Bengal
26th West Bengal State Science and Technology Congress, 2019	Presenter	March 1, 2019	Department of Science & Technology and Biotechnology, Government of West Bengal

10. Membership in Academic Bodies

Bio-Mathematical Society of India (Member)

11. Awards/Honours

Award	Organization	Year	Description
Consultant	Barcelona Institute for Global Health Foundation	2024	Mathematical Modelling
Received Major Research Project	DST-SERB	2019	Project Title: Mathematical and Statistical Analysis of

			Memory Effect in Disease Transmission- A fractional Calculus Approach
Outstanding Paper award	26th West Bengal State Science and Technology Congress, 2019 organized by Department of Science & Technology and Biotechnology, Government of West Bengal	2019	
Selected as a Post Doctoral Researcher in Mathematical Modelling of Neglected Tropical Diseases	Department of Biological Sciences, University of Norte Dame in 2016	2016	
Post Doctoral Fellow	NBHM (National Borad for Higher Mathematics)	2016	

Post Doctoral Fellow	The Catalan Institute of Climate Sciences (IC3), Barcelona, Spain	2015	
Visiting fellow in Mathematical Epidemiology	Centre de Recerca Matemàtica, Barcelona, Spain	1st April 2015 – 1st June 2015	
Junior Research Fellow in UGC-CSIR NET, 2009	Council of Scientific and Industrial Research	2009	

13. Administrative Responsibility:

- Joint convenor Library Committee
- Member of Exam committee.
- Member of Admission committee.
- Member of Computer committee.