



### Curriculum Vitae



*Brief profile:* I pursued my graduation (B.Sc.) in Mathematics (Honors) from Serampore College affiliated to the University of Calcutta during 2006-2009. In the year 2009, I cleared Joint Admission Test for M.Sc. (JAM-2009) and joined Indian Institute of Technology Kharagpur as a masters' student in the M.Sc.-PhD dual degree program. I completed my M.Sc. in 2011 and thereafter got selected to pursue PhD in the department of Mathematics under the guidance of Dr. Jitendra Kumar. In 2013, I got the prestigious DAAD-fellowship and visited Otto-von-Guericke University, Magdeburg, Germany for research purpose under the supervision of Prof. Dr. Gerald Warnecke. I had submitted my PhD thesis on November, 2016 and defended it in March, 2017. In between I joined as a Research Associate in a DST-SERB funded research project undertaken by Dr. Koeli Ghoshal, department of Mathematics, Indian Institute of Technology Kharagpur. I continued the post of research associate till March, 2018 after which I joined as an Assistant Professor in the department of Mathematics, National Institute of Technology Tiruchirappalli.

*Broad area of my research:* I am working in the mathematical and numerical analysis of the intrgro –differential equations. In particular, my research problem is the mathematical representation of the particulate processes like aggregation, fragmentation that are occurring in various natural phenomena, as well as, in different engineering sectors. Well known application of particulate processes is, formation of instant coffee powder, pharmaceutical tables/capsules, grinding of minerals from their ores etc. In our study, we try to incorporate the physically realistic kinetic rates of particle aggregation and fragmentation in the standard model and then examine the existence and uniqueness of the solutions. In broader area, my objective is to study different aspects of the solutions for the concerned problem. In several occasions, different analytic and semi-analytic methods are very handy to find the solution. Besides, I also perform numerical computations in the search for the approximate solutions of the problems. In computational section, I prefer to analyze different numerical models which are extensively used by the engineers in practice. Ideas of functional analysis is used to execute the mathematical and numerical analysis. For computation of a numerical model, I use software packages like MATLAB and MATHEMATICA.

1. Name : JITRAJ SAHA
2. Designation : Assistant Professor
3. Office Address : Room # 210, Department of Mathematics, LYCEUM building,  
NIT Campus, Tiruchirappalli - 620 015, Tamil Nadu
4. Telephone (Direct) (Optional) : Extn (Optional)  
Telephone: : Mobile (Optional): +91-9486001180 / +91-9477033914
5. Email (Primary) : [jitraj@nitt.edu](mailto:jitraj@nitt.edu)  
Email (Secondary) :
6. Field(s) of Specialization: (i) Mathematical and Numerical Analysis of ODEs and PDEs.  
: (ii) Applications of Semigroup theory of Operators in physical problems



National Institute of Technology, Tiruchirappalli  
CV of Dr. Jitraj Saha

7. Employment Profile

Job Title	Employer	From	To
Assistant Professor	National Institute of Technology Tiruchirappalli	April, 2018	Till Date
Research Associate <sup>#1</sup>	Indian Institute of Technology Kharagpur	January, 2017	March, 2018

#1 **Project Title:** *Theoretical Investigation on Turbulent Features and Concentration Distribution in an Open Channel Flow.*

8. Academic Qualifications (From Highest Degree to High School):

Examination	Board / University	Year	Division/ Grade	Subjects
PhD <sup>#2</sup>	Indian Institute of Technology Kharagpur	2017	N/A	Mathematics
MSc <sup>#3</sup>	Indian Institute of Technology Kharagpur	2011	N/A	Mathematics
BSc	Serampore College (University of Calcutta)	2009	First	Mathematics (Hons)

#2 PhD **Thesis Title:** *Mathematical and Numerical Study of Coagulation Fragmentation Models.*

#3 MSc **Thesis Title:** *Numerical and Mathematical Analysis of Population Balance Equations (PBEs).*

9. Academic /Administrative Responsibilities within the University

Position	Faculty/Department/Centre/Institution	From	To
Faculty Advisor	Literary Club (Akshara & Aayam)	29 July, 2021	Till date
Warden	Agate, Garnet – C and Mess – A, NIT Tiruchirappalli	20 July, 2019	Till date
Coordinator, Space Allocation Committee	Department of Mathematics, NIT Tiruchirappalli	12 February, 2020	Till date
Executive member, Budget and Purchase Committee	Department of Mathematics, NIT Tiruchirappalli	12 February, 2020	Till date
Executive member, Grievance Committee	Department of Mathematics, NIT Tiruchirappalli	12 February, 2020	Till date

10. Academic /Administrative Responsibilities outside the University

Position	Institution	From	To
Doctoral Committee (DC) member	Vellore Institute of Technology (VIT) Chennai	23 April, 2022	Till Date

11. Awards, Associateships etc.



National Institute of Technology, Tiruchirappalli  
CV of Dr. Jitraj Saha

Year of Award	Name of the Award	Awarding Organization
2014	CSIR NET	CSIR

12. Fellowships

Year of Award	Name of the Fellowship	Awarding Organization	From (Month/Year)	To (Month/Year)
2022	Henriette Herz-Scouting-Programm	Alexander von Humboldt	Did not avail	
2013	DAAD Fellowship	DAAD	October, 2013	January, 2014
2010	VSRP - 2010	TIFR Mumbai	June, 2010	July, 2010

13. Details of Academic Work

(A) **Curriculum Development:** BOS Member for the introduction of MSc in Mathematics at NIT Tiruchirappalli

(B) **Courses taught at Postgraduate and Undergraduate levels:** (at NIT Tiruchirappalli)

**UG level:**

Course Number	Course Name	Session	Level
MAIR 11	Mathematics – I / Matrices & Calculus	July – 2018 ; July 2019	1 <sup>st</sup> year UG
MAIR 21	Mathematics – II / Complex Analysis & Differential Equations	Jan – 2019 ; Jan – 2020 ; Jan – 2021 ; Jan – 2022	1 <sup>st</sup> year UG
MAIR 44	Principles of Operation Research	Jan – 2019 ; Jan – 2020	2 <sup>nd</sup> year UG
MAIR 31	Probability and Operations Research	July – 2020 ; July – 2021	2 <sup>nd</sup> year UG

**PG Level:**

Course Number	Course Name	Session	Level
MA 851	Applied Mathematics	Jan – 2019 ; Jan – 2020 ; Jan – 2022	PhD Course work
MA 601	Numerical Methods and Applied Statistics	July – 2019	MTech
MA 724	Integral Equations & Calculus of Variations	July – 2020 ; July – 2021	MSc

(C) Projects guided at Postgraduate level:

SI No	Name (Roll)	Title of Thesis	Year	Level	Grade
i)	Harshit Bhatt (216120005)	Solutions of the Population Balance Models for Growth and Nucleation	2022	M.Sc. Math	A
ii)	Nilanjana Das	Numerical Solution of Breakage Population	2022	M.Sc.	A



National Institute of Technology, Tiruchirappalli  
CV of Dr. Jitraj Saha

	(216120014)	Balance Equation		Math	
iii)	Nikhil Saurav (216119009)	Semi Analytical Methods for Solving Differential Equations	2021	M.Sc. Math	<b>S</b>

(D) Other contribution(s): **N/A**

14. Details of Major R&D Projects **Coming soon**

Title of Project	Funding Agency	Duration		Status
		From	To	Ongoing / Completed
Analytical solutions for the population balance models representing collision induced random scission	R&C, NIT Tiruchirappalli	August, 2019	July, 2022	Ongoing

15. Number of PhDs guided

Sl No	Name of the PhD Scholar/s	Title of PhD Thesis	Role (Supervisor/ Co-Supervisor)	Year of Award
i)	Amit Paswan (Jan – 2022)	To be decided	Supervisor	–
ii)	Farel William Viret Kharcandy (Jan – 2021)	To be decided	Co-Supervisor	–
iii)	Prakrati Kushwah (July – 2020)	To be decided	Supervisor	–
iv)	Arijit Das (Jan – 2020)	To be decided	Supervisor	–

16. Participation in Workshops/ Symposia/ Conferences/ Colloquia /Seminars/ Schools etc. (mentioning the role)

Date (s)	Title of Activity	Level of Event (International/ National/ Local)	Role (Participant/ Speaker/ Chairperson, Paper presenter, Any other)	Event Organized by	Venue
September 4 – 9, 2014	Colloquium	International	Participant	Alexander von Humboldt Organization	IISC Bangalore

17. Workshops/ Symposia/ Conferences/ Colloquia/Seminars Organized (as Chairman/ Organizing Secretary/ Convenor / Co-Convenor)

Sl No.	Title of Activity	Level of Event (International/ National)	Date (s)	Role	Venue
i)	Five days Online Workshop on Software in Mathematics & Statistics (W – SMS)	National	02 – 06 August, 2021	Convener	NIT Tiruchirappalli



National Institute of Technology, Tiruchirappalli  
CV of Dr. Jitraj Saha

ii)	Five days Online Workshop on Functional Analysis & Numerical Analysis (W – FANA)	National	05 – 09 April, 2021	Convener	NIT Tiruchirappalli
iii)	Short Term Course on Numerical Analysis using Matlab	National	15 –19 May, 2019	Coordinator	NIT Tiruchirappalli

18. Invited Talks delivered

Sl No	Topic	Date	Inviting Organization
i)	Mathematical advancement in the studies of nonlinear integro-partial differential equations	31 march, 2022	MRF Lecture, Department of Mathematics, NIT Tiruchirappalli
ii)	Numerical Methods in Research	25 March, 2022	Kumaraguru College of Liberal Arts and Science
iii)	Theoretical Studies on collision induced breakage equation	06 September, 2021	Department of Mathematics, Indian Institute of Technology Gandhinagar, Gujrat
iv)	Semi-Analytical methods for solving ODEs	07 August, 2021	Center for Applied Mathematics & Computing, ITER, Siksha 'O' Anusandhan, Bhubaneswar, Orissa
v)	Application of Semi-Analytical Methods	19 March, 2021	Govt. College of Technology, Coimbatore, Tamil Nadu
vi)	MATLAB as a teaching and learning tool for mathematics	29 August, 2020	Sonamukhi college (University of Bankura), West Bengal
vii)	Basics of Finite Volume Methods	19 May, 2019	NIT Tiruchirappalli

19. Membership of Learned Societies

Type of Membership (Ordinary Member/ Honorary Member / Life Member)	Organization	Membership No. with date
N/A		

20. Academic Foreign Visits

Country	Duration of Visit	Programme
Germany	October 2013 - January, 2014	DAAD Fellowship for PhD registered students

21. Publications

A. Refereed Research Journals:

Sl. No.	Author(s)	Title of Paper	Journal	Vol. (No.)	Page Nos	Year	Journal IF (2021)
1.	Arijit Das, <a href="#">Jitraj Saha</a>	The discrete Safronov-Dubovskii aggregation equation:	Journal of Mathematical	514 (1)	126310	2022	1.583



National Institute of Technology, Tiruchirappalli  
CV of Dr. Jitraj Saha

		Instantaneous gelation and nonexistence theorem	Analysis and Applications				
2.	Arijit Das, <a href="#">Jitraj Saha</a>	Existence and uniqueness of mass conserving solutions to the coagulation and collision-induced breakage equation	The Journal of Analysis	In Press		2022	
3.	Arijit Das, <a href="#">Jitraj Saha</a>	On the global solutions of discrete Safronov-Dubovskii aggregation equation	Zeitschrift für angewandte Mathematik und Physik (ZAMP)	72 (5)	1 – 17	2021	2.170
4.	Arijit Das, Nilima Das, <a href="#">Jitraj Saha</a>	An application of semigroup theory to the coagulation-fragmentation models	Turkish Journal of Mathematics	45 (5)	2282 – 2294	2021	0.859
5.	<a href="#">Jitraj Saha</a> , Andreas Bück	Conservative Finite Volume Schemes for Multidimensional Fragmentation Problems	Mathematics	9 (6)	635	2021	2.258
6.	<a href="#">Jitraj Saha</a> , Andreas Bück	Improved accuracy and convergence analysis of finite volume methods for particle fragmentation models	Mathematical Methods in the Applied Sciences	44 (2)	1913 – 1930	2021	2.321
7.	Debdulal Ghosh, <a href="#">Jitraj Saha</a> , Jitendra Kumar	Existence and uniqueness of steady-state solutions to a singular coagulation-fragmentation equation	Journal of Computational and Applied Mathematics	380	112992	2020	2.621
8.	Nilima Das, <a href="#">Jitraj Saha</a> , Jitendra Kumar	An application of semigroup theory to the pure fragmentation equation	The Journal of Analysis	28 (1)	95 – 106	2020	-
9.	<a href="#">Jitraj Saha</a> , Nilima Das, Jitendra Kumar, Andreas Bück	Numerical solutions for multidimensional fragmentation problems using finite volume methods	Kinetic and Related Models	12 (1)	79 – 103	2019	1.641
10.	Manotosh Kumbhakar, <a href="#">Jitraj Saha</a> , Koeli Ghoshal, Jitendra Kumar, Vijay P. Singh	Vertical Sediment concentration distribution in high-concentrated flows: An analytical solution using Homotopy Analysis Method	Communications in Theoretical Physics	70 (3)	367 – 378	2018	1.968
11.	<a href="#">Jitraj Saha</a> , Jitendra Kumar, Stefan Heinrich	On the approximate solutions of fragmentation equations	Proceedings of the Royal Society A	474 (2209)	2017054 1	2017	2.818
12.	<a href="#">Jitraj Saha</a> , Jitendra Kumar, Stefan	A volume-consistent discrete formulation of particle breakage equation	Computers & Chemical Engineering	97	147 – 160	2017	3.845



National Institute of Technology, Tiruchirappalli  
CV of Dr. Jitraj Saha

	Heinrich						
13.	<a href="#">Jitraj Saha</a> , Jitendra Kumar, Andreas Bück, Evangelos Tsotsas	Finite volume approximations of breakage population balance equation	Chemical Engineering Research and Design	110	114 – 122	2016	3.739
14.	Jitendra Kumar, <a href="#">Jitraj Saha</a> , Evangelos Tsotsas	Development and convergence analysis of a finite volume scheme for solving breakage equation	SIAM Journal on Numerical Analysis	53 (4)	1672 – 1689	2015	2.712
15.	<a href="#">Jitraj Saha</a> , Jitendra Kumar	The singular coagulation equation with multiple fragmentations	Zeitschrift für angewandte Mathematik und Physik (ZAMP)	66 (3)	919 – 941	2015	2.170
16.	Randhir Singh, <a href="#">Jitraj Saha</a> , Jitendra Kumar	Adomian decomposition method for solving fragmentation and aggregation population balance equations	Journal of Applied Mathematics and Computing	48 (1 – 2)	265 – 292	2015	1.686

B. Conferences / Workshops / Symposia Proceedings

Sl no	Author(s)	Title of Paper	Title of the Journal	Vol. (Issue), Year	Conference Theme (Venue)
1.	Prakrati Kushwah, <a href="#">Jitraj Saha</a>	Solution of Population Balance Equation using Homotopy Analysis Method	Springer Proceedings in Mathematics & Statistics	Accepted, 2022	FIAM – 2021, SLIET Longolowal Punjab
2.	Arijit Das, <a href="#">Jitraj Saha</a>	Existence and Uniqueness of Mass Conserving Solutions to the Coagulation, Multi-fragmentation Equations with Compactly Supported Kernels	Lecture Notes in Electrical Engineering	897, 2022	1 <sup>st</sup> International Conference on Applied Analysis Computation and Mathematical Modelling in Engineering, NIT Rourkela
3.	<a href="#">Jitraj Saha</a> , Jitendra Kumar	Development of a mass conserving discretization technique for breakage problems and its convergence analysis	International Journal on Advances in Engineering Sciences and Applied Mathematics	7 (1 – 2), pp 51 – 61, 2015	International Conference on Mathematical Modeling and Computer Simulation, IIT Madras

C. Books & Monographs

Author(s)	Title of Book/Monograph	Name of Publishers	Year of Publication	ISSN/ISBN Number
-----------	-------------------------	--------------------	---------------------	------------------



# National Institute of Technology, Tiruchirappalli

## CV of Dr. Jitraj Saha

---

--	--	--	--	--

### 1. Other Activities:

- i) Appointed in the reviewer panel of American Mathematical Society (MathSciNet / Mathematical Reviews indexing database) Reviewer Id – 156015
- ii) Reviewer of the following journals

Elsevier	Springer	Others (Publisher)
Journal of Computational Physics	BIT Numerical Mathematics	Crystal Growth & Design (American Chemical Society)
Applied Mathematics and Computation	ZAMP (Birkhauser)	Journal of Applied Analysis (de Gruyter)
Chemical Engineering Research and Design	Bulletin of Malaysian Mathematical Society	Proceedings of the Royal Society London A: Mathematical, Physical and Engineering Sciences