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2. (i) Address for Communication:

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3. Date of Birth : 09/09/1974

4. Educational Qualification: M.Sc., P.G.D.C.S.A., Ph.D.

5. (i) Name of the Ph. D. supervisor: Prof. (Dr.) B.S. Mazumder, Emeritus Scientist,

   Department of Aerospace Engineering, IIEST, Shibpur.

   (ii) The Title of the Thesis: "MASS TRANSPORT PHENOMENA IN STEADY AND

   UNSTEADY FLOWS"

6. Teaching and research experience:

Employer	Position held	Place of work	Duration	Nature of work
CSIR, Govt. of India	JRF	ISI, Kolkata	07.08.2000 – 31.08.2002	Research work for Ph.D.
CSIR, Govt. of India	SRF	ISI, Kolkata	01.09.2002 – 10.06.2003	Research work for Ph.D.
Alipurduar College, Alipurduar, West Bengal	Assistant Professor (AGP – 8000/-)	Department of Mathematics , Alipurduar College, Jalpaiguri PIN – 736 122 West Bengal	11.06.2003 – 11.05.2015	Teaching Mathematics at B.Sc. (Honours) level

Islampur College, Uttar Dinajpur, West Bengal	Associate Professor (AGP – 9000/-)	Department of Mathematics , Islampur College, Uttar Dinajpur, PIN – 733 202 West Bengal	12.05.2015 – 31.10.2017	Teaching Mathematics at B.Sc. (Honours) level
Cooch Behar Panchanan Barma University, Cooch Behar, West Bengal	Associate Professor (AGP – 9000/-)	Department of Mathematics , Cooch Behar Panchanan Barma University, Cooch Behar, PIN – 736 101 West Bengal	01.11.2017 – Till date	Teaching Mathematics at M.Sc. level and guidance for Ph.D.
DST, Govt. of India	BOYSCAST Fellow	Department of Mathematics, Statistics and Applied Mathematics, National University of Ireland, Galway, Ireland	08.07.2009 – 07.07.2010	Post - Doctoral research work

7. Post Doctoral Research Experience:

Name of the institution	Designation & Scale of pay	Name of the post	Nature of Assignment	Duration From – To
National University of Ireland, Galway, Ireland	BOYSCAST Fellow $ 3000 per month (DST grant)	BOYSCAST Fellow	Post Doctoral Research	08.07.2009-07.07.2010

8. Fields of Specialization under the Subject/Discipline **:**

(a) Computational Fluid Dynamics (Ph. D. & Post Doc)

(b) MHD and Plasma Mechanics (M.Sc.)

9. Research, Publications and Academic Contributions :
   A. **Published papers in journals:**

Sl. No	Title with page number	Journal Name	ISBN/ISSN/ Categorization Refereed/Non
1.	On the solute dispersion in a pipe of annular cross-section with absorption boundary, Vol. 85(6),pp.422-430, 2005	Z. Angew. Math. Mech.	0044-2267
2.	On solute transport in oscillatory flow through an annular pipe with a reactive wall and application to a catheterized artery,	Quarterly Journal of Mechanics and	0033-5614

		Vol. 58(3), pp. 349-365, 2005	Applied Mathematics	
3.	On solute dispersion in pulsatile flow through a channel with absorbing walls, Vol. 40, pp. 69-81, 2005	International Journal of Non-linear Mechanics	0020-7462
4.	On dispersion of settling particles from an elevated source in an open-channel flow, Vol. 193, pp. 22-37, 2006	Journal of Computational and Applied Mathematics	0377-0427
5.	Dispersion of fine settling particles from an elevated line-source in an oscillatory turbulent flow, Vol. 27, pp. 707-725, 2008	European Journal of Mechanics – B/Fluids	0997-7546
6.	Improved mathematical and numerical modeling of dispersion of a solute from a continuous source, Vol. 81, pp. 177–185, 2011	Boundary and Interior Layers, computational and Asymptotic Methods, Springer,	ISBN: 978– 3– 642–19664–5
7.	Application of finite difference method for time independent transport processes, Vol. 1, No. 2, pp.71-80, 2014	Research Journal of Pure Science	2348-5361
8.	On dispersion of Solute through an annular pipe in convection dominated flows, Vol. 2, No. 2, pp.6-14, 2015	Research Journal of Pure Science	2348-5361
9.	Application of fitted operator on dispersion of fine settling particles in an open channel flow, 2017	Communicated to Environmental Research, Elsevier	– – –
10	On steady-state solute dispersion through an annular pipe in convection dominated flows and application to a catheterized artery, 2018	Communicated to Journal of Mathematical Biosciences, Elsevier	– – –

B (i) **Articles/Chapters published in Books:**

Sl. No	Title with page numbers	Book title, Editor & Publisher	ISBN/ISSN No/ (Or, Renowned publishers)
1.	On dispersion of fine settling particles in a turbulent open channel flow: A fitted operator approach (111-119)	Modern trends in social and basic sciences, Readers Service, Kolkata, India	978-93-82623-51-9
2.	Application of finite element method in steady transport processes (37 – 46)	Trends and developments in science, social science and humanities, Progressive Publishers, Kolkata	978-81-8064-231-9

(ii) **Full papers in Conference Proceedings :**

Sl. No	Title with page number	Details of Conference Publication	ISBN/ISSN
1.	Measurements of turbulent flow over an artificial wave form in an open channel by 3-D Acoustic Doppler Velocimeter, (398 – 405)	Proceedings of Conference on Hydraulics, Water Resources and Ocean Engineering , HYDRO-2003	HYDRO-2003, Indian Society for Hydraulics, Pune
2.	A computational study on resolving layer phenomena for the stationary convection diffusion problems (101 – 107)	Proceedings of recent advances in the application of mathematical analysis and computational techniques in applied sciences, 02.12.2011 – 04.12.2011	978-81-909694-2-0
3.	Near field dispersion of solute in a turbulent open channel flow from continuous elevated sources (41 – 51)	Proceedings of the UGC Sponsored State Level Seminar on Recent Advances in Basic Science, 24.09.2016	978-81-931261-6-5

(iii) Books Published as a Single/Joint Author/Editor :

Sl. No	Title with page number	Type of Book/ and Authorship	Publisher & ISBN/ISSN/ Categorization
1.	Solute transport phenomena in steady and time-dependent flows	Research level reference book	Schloar's Press, Verlag publisher, Omni Scriptum GmbH & Co. KG, Saarbrucken, Germany ISBN: 978-3-639-70279-8
2.	Mass transport phenomena in turbulent open channel flows	Research level reference book	Lambert Academic Publishing, Omni Scriptum GmbH & Co. KG, Saarbrucken, Germany ISBN: 978-3-330-07500-9

C) Ongoing and Completed Research Projects and Consultancies :

Sl. No	Title	Agency (Funding, Commissioning and/or Collaborating)	Period	Grant(s)/ Amount mobilized (so far) in Rs. (Lakhs)	Whether Principal Investigator/ Co-investigator or Consultant/Quality evaluator
1	Design of efficient numerical/qualitative methods for solving differential equations	DST **(2009)**	1 Year	3000 dollar per Month	Principal Investigator
2.	A Computational Study on Solute Transport Phenomena in	UGC	2 Years	1.63 Lakh	Principal Investigator

	Convection Dominated Flows	**(2012)**			
3.	On Solute Dispersion in Advection Dominated Flows (Ongoing)	**UGC** **(2017)**	2 Years	**2.64 Lakh**	Principal Investigator
4.	Computational Study to Design Novel Algorithms for Solving Advection-Dominated Time-Dependent Advection-Diffusion Problems (Ongoing)	NBHM (2017)	3 Years	13.5 Lakh	Co-investigator

d) **Conference/Seminar/Workshop paper presentation:**

Sl. No.	Title of the Paper presented	Title of Conference / Seminar	Organised by	Whether International / National/State/Regional / University/College level
1.	Dispersion in pulsatile flow through a channel with absorbing walls	National Seminar on Recent Trends in Mathematics (Dec, 2002)	Department of Mathematics, University of Burdwan	National
2.	A computational study of a fluid flow problem featuring an interior layer for near field contamination	National Seminar on Non-Linear Dynamics and Astrophysics (09.10.2010)	Department of Mathematics, NBU & IUCAA Resource Centre, Dept. of Physics, NBU	National
3.	A computational study on resolving layer phenomena for the convection dominated advection-diffusion problems	Indo-US bilateral workshop on Ecological health of rivers (01.11.2010 – 03.11.2010)	ISI, Kolkata	International
4.	A computational study on resolving layer phenomena for the stationary convection-diffusion problems	National Seminar on Recent Advances in the Application of Mathematical Analysis and Computational Techniques in Applied Sciences (02.12.2011 – 04.12.2011)	Department of Mathematics, Siliguri College, Siliguri	National

5.	Layer adapted meshes for steady-state convection dominated convection-diffusion problems	National Conference on Emerging Trends in Physics of Fluids and Solids (27.02.2013 – 28.02.2013)	Department of Mathematics, Jadavpur University	National
6.	Application of layer adapted meshes on dispersion of fine particles in an turbulent open channel flow	3rd International Conference on Frontiers of Mathematics and Applications (29.01.2014 – 31.01.2014)	Department of Mathematics, University of Burdwan	International
7.	Numerical modelling of dispersion of suspended particles in an open channel flow: A fitted operator approach	International Conference on Emerging Trends in Applied Mathematics (12.02.2014 – 14.02.2014)	Department of Applied Mathematics, University of Calcutta	International
8.	Dispersion of solute in oscillatory flow through an annular pipe	National Conference on Emerging Trends in Physics of Fluids and Solids (06.03.2014 – 07.03.2014	Department of Mathematics, Jadavpur University	National
9.	Application of fitted operator method on dispersion of fine particles in an open channel flow	International Conference on Modern Trends in Social and Basic Sciences (27.03.2015 – 28.03.2015)	Alipurduar College, Alipurduar	International
10.	Application of Finite Element Method in Steady Transport Processes	National Seminar on Trends and Developments in Science, Social Science and Humanities (22.08.2015)	Islampur College, Uttar Dinajpur	National

| 11 | Solute transport in oscillatory flow through an annular pipe with a reactive wall | National Seminar on Frontiers in Science and Technology Towards National Development

(10.04.2016 – 11.04.2016) | A.B.N. Seal College, Cooch Behar | National |
|---|---|---|---|---|
| 12. | Near field dispersion of solute in a turbulent open channel flow from continuous elevated sources | State Level Seminar on Recent Advances in Basic Science, (24.09.2016) | Islampur College, Uttar Dinajpur | State |
| 13. | Solute dispersion through an annular pipe in steady state convection dominated flows (With Niranjan Paul) | State Level Seminar on Recent Advances in Basic Science, (24.09.2016) | Islampur College, Uttar Dinajpur | State |
| 14. | On steady-state solute dispersion through an annular pipe in convection dominated flows | International Interdisciplinary Seminar on Contemporary Developments in Social and Basic Sciences in Times of Global Crisis

(28.03.2017 – 29.03.2017) | Surya Sen Mahavidyalaya, Siliguri | International |
| 15. | Numerical difficulties and challenges in environment modelling | International Conference on Environmentalism, Globalism and Morality

(10.01.2018 – 12.01.2018) | The Institute of Cross-Cultural Studies and Academic Exchange, ELON, EC, USA in collaboration with Alipurduar College, Maynaguri College and Cooch Behar Pancnanan Barma University | International |

e) Training courses:

Sl. No	Name of the course	Duration	Organized by
1.	Orientation Programme	28 days	ASC, University of Burdwan

		(06.06.2006 – 03.07.2006)	
2.	8th Annual Workshop on Numerical Methods for Problems with Layer Phenomena	2 days (21.01.2010 – 22.01.2010)	Department of Mathematics and Statistics, University of Limerick, Limerick, Ireland
3.	Refresher Course in Mathematics (Interdisciplinary)	21 days (04.01.2012 – 24.01.2012)	ASC, University of North Bengal
4.	Refresher Course in Information and Communication Technology (Interdisciplinary)	21 days (26.11.2014 – 16.12.2014)	ASC, University of Burdwan

f) Chaired a session/ Judge in Conference/Seminar/Workshop etc.:

Sl. No.	Acted as	Title of Conference / Seminar	Organised by	Whether International / National/State/Regional / University/College level
1	Chaired a session	International Interdisciplinary Seminar on Contemporary Developments in Social and Basic Sciences in Times of Global Crisis (28.03.2017 – 29.03.2017)	Surya Sen Mahavidyalaya, Siliguri	International
2	Judge	2nd Regional Science & Technology Congress, 2017 (07.12.2017 – 08.12.2017)	Siliguri College Jointly with Department of Higher Education, Science & Technology and Bio Technology, Government of West Bengal	Regional

10. Honours and Awards received:

i) Qualified for JRF in the CSIR/UGC NET in 1999 and received the Fellowship from Council of Scientific and Industrial Research (CSIR), New Delhi as JRF and SRF.

ii) Selected for **BOYSCAST** (Better Opportunities for Young Scientists in Chosen Areas of Science and Technology) **Fellowship** from DST in 2008 – 2009 for pursuing Post-Doctoral research work in the School of Mathematics, Statistics and Applied Mathematics, National University of Ireland, Galway, Ireland.

11. Brief summary of previous and current research work:

During the course of my doctoral studies I investigated problems related to the longitudinal dispersion of passive scalar contaminants in both steady and unsteady flow cases. Laminar and turbulent types of flow through conduits with or without particle settling velocities were considered. Such transport problems occur in a wide range of applications ranging from physiological fluid dynamics to environmental fluid dynamics.

The aim of the work was to conduct a numerical study to understand the basic mechanism of mass transportation in longitudinal direction, and to predict the dispersion coefficient, mean concentration distribution, iso-lines of concentration in a vertical plane for a given time. The corresponding profiles change their nature in different regimes over a period of time. Standard finite-difference method was used for the modeling purpose and results obtained were tested and verified against the data available in the literature.
One of the significant contributions of my work was to analyze the dispersion phenomena through a catheterized artery with a first-order heterogeneous boundary reaction at the wall.

Followings are the summary of my research work:

(i) to understand the basic mechanism of mass transport phenomena in steady and unsteady (laminar or turbulent) flows;
(ii) to provide a numerical framework for the interpretation of contaminant spreading in certain flow geometries;
(iii) to study how the tracer molecules are depleted or protected by the first order heterogeneous boundary reaction;
(iv) to determine the dispersion coefficient and axial mean concentration distribution in the longitudinal direction due to the combined action of boundary reaction and the flow oscillation;
(v) to study the effect of settling velocity of suspended particles on the dispersion process;
(vi) to understand, how the spreading of suspended particles are influenced by the combined action of steady or oscillatory shear flow, settling velocity and the corresponding eddy diffusivity over the rough bed surface for all time period and to find the iso-concentration lines in the vertical plane.

During my Ph. D. dissertation the main focus was on theoretical aspects of the study. However, I had a hand-on experience to deal with Acoustic Doppler Velocimeter (ADV) and High Speed Video Camera (HSVC) to study turbulent open-channel flow at the Fluvial Mechanics Laboratory, ISI, Kolkata.

I worked as a visiting research fellow in School of Mathematics, Statistics, and Applied Mathematics, National University of Ireland, Galway from 08.07.2009 – 07.07.2010. The one year visit had been funded by Department of Science and Technology (DST) under BOYSCAST Post-Doctoral fellowship scheme. I worked on "designing certain efficient numerical/qualitative methods for solving differential equations" related to hydrodynamics and solute transportation in the regions of strong tide-induced currents. My supervisor there was Professor Dr. N. Madden, School of Mathematics, Statistics, and Applied Mathematics, National University of Ireland,

Galway. The work was being carried out in collaboration with a group of researchers from Marine Modelling Centre, National University of Ireland, Galway, led by Dr. M. Hartnett.