

Mrinmay Biswas

CONTACT INFORMATION Technische Universität Wien
Institut für Analysis and Scientific Computing, *Mob:* +43 681 84682322.
Wiedner Hauptstr. 8-10 *E-mail:* mrinmay141@gmail.com,
1040 Wien, mrinmay.biswas@tuwien.ac.at.
Austria.

PERSONAL INFORMATION Nationality: Indian.
Date of Birth: 14th September, 1985.
Sex: Male.

RESEARCH INTERESTS **Partial Differential Equations, Stochastic PDEs, Numerics, Control Theory, Nonlocal PDEs.**

- **Stochastic (Partial) Differential Equations :** Local and global solvability of stochastic cross diffusion system and chemotaxis Keller-Segel system, Blow up of Keller-Segel system.
- **Numerics :** Numerics of Stochastic Cross Diffusion system, Trigonometric method and Finite element approximations of stochastic evolution equations. Euler-Bernoulli beam equations.
- **Control of Partial Differential Equations:** Controllability, Stabilizability of FitzHugh-Nagumo equations, Rogers-McCulloch equations, Chemotaxis Keller-Segel system.
- **Geometric and Non-linear Control Theory :** Controllability of Landau–Lifshitz–Gilbert equations.
- **Nonlocal Partial Differential Equations :** Controllability of non-local parabolic partial differential equations, Carleman’s inequalities for non-local partial differential equations.
- **Backward Uniqueness of Partial Differential Equations :** Backward uniqueness and approximate controllability of compressible Navier-Stokes equations.
- **Best Constant Problem:** Best constants of generalized Hardy’s inequality, Caffarelli–Kohn-Nirenberg’s inequality, Bliss inequality. Domain invariance of best constants.

PREPRINTS AND PUBLICATIONS

Journal publications:

1. On The Best Constant of The One-dimensional Bliss Inequality. *Houston Journal of Mathematics* Electronic Edition Vol. 46, No. 1, 2020, pp. 189-200.
2. Approximate controllability of the FitzHugh-Nagumo equation in one dimension *J. Differential Equations*, 268 (2020) pp. 3497-3563. (with Shirshendu Chowdhury and Rajib Dutta)

In preparation :

1. Global Martingale Solution of Stochastic Cross Diffusion System, [On preparation](#), 2021. (with Ansgar Jüngel)
2. Controllability and support theorems for Landau–Lifshitz–Gilbert equations by means of low mode forcing, [Submitted](#), 2021. (with Erika Hausenblas and Debopriya Mukherjee)
3. Finite element approximation of the Stochastic Euler-Bernoulli beam equations driven by additive noise, [Submitted](#), 2021. (with Debopriya Mukherjee and Akash Ashirbad Panda)
4. Backward uniqueness of linearized compressible Navier Stokes system in one dimension, [Preparing to submit](#), 2021. (with Shirshendu Chowdhury)

5. On Domain Invariance Property of Generalized Hardy's Inequality in N-Dimension. [Preprint available](#) 2020. (with Saugata Bandyopadhyay)
6. Blowup of stochastic two dimensional Keller-Segel system, [On preparation](#), 2021. (with Erika Hausenblas)
7. Martingale solution of stochastic cross diffusion system, [On preparation](#) 2021. (with Erika Hausenblas and Debopriya Mukherjee)
8. Controllability of Keller-Segel system, [On preparation](#), 2021. (with Erika Hausenblas)
8. Controllability and Connected components of stable solutions of FitzHugh-Nagumo equation, [On preparation](#), 2021. (with Shirshendu Chowdhury)

EMPLOYMENT

Technische Universität Wien, Vienna, Austria.

Post doc (October 2021–present).

Montanuniversität Leoben, Leoben, Austria.

Project Assistant of Mathematics (April 2021–October 2021).

Barasat College, West Bengal, India.

Assistant Professor of Mathematics (November 2019–April 2021).

REVA Institute of Technology, Bangaluru, India.

Assistant Professor of Mathematics (July 2013–December 2013).

EDUCATION

Indian Institute of Science Education and Research, Kolkata, India.

Ph.D in Mathematics

- Dissertation Title: Three Problems in Nonlinear Analysis.
- Thesis Supervisor: Dr. Saugata Bandyopadhyay.
- Date of Completion/Defense: 16 January, 2020.

Tata Institute of Fundamental Research, Centre for Applicable Mathematics, Bangalore, India.

1. **Course work done:** 2009–13

Courses covered: Brownian motion and Stochastic Partial Differential Equations, Degree Theory.

2. **Reading course:** 2009–13

Courses covered: Calculus Of Variations, Elliptic Partial Differential Equations, Blow-up analysis, Studied the following books: Oksendal's Stochastic Differential Equations; Da-Prato and Zabczyk's Stochastic Equations in infinite dimensions; Applebaum's Levy Process and Stochastic Calculus; Gilbarg-Trudinger's Elliptic Partial Differential Equation of second order; Ambrosetti-Malchiodi's Non Linear Analysis and semilinear elliptic problem; Han-Lin's Elliptic Partial Differential Equations (Courant Lecture notes); Willem's Minimax Theorems; Lions' Concentration Compactness Principles etc.

Tata Institute of Fundamental Research, Centre for Applicable Mathematics, Bangalore, India.

M.S. in Mathematics (2007–09) (*Secured 1st rank in the batch*).

Ramakrishna Mission Vidyamandira, Belur Math (University of Calcutta), Howrah, India

B.Sc., Mathematics(major), Physics and Computer Science (2004–07) (*Secured 6th rank in the university's merit list of Mathematics honours*).

Habra High School (H.S.)

(West Bengal Council of Higher Secondary Education) (2002-04): Higher Secondary in Science Stream (*Obtained full marks in Mathematics 200/200*)

(West Bengal Board of Secondary Education) (2002): Secondary Board Examination.

TEACHING EXPERIENCE

At Barasat College, West Bengal, India

- 1st Semester, 2019 : Inequalities, Classical Algebra, *Undergraduate Level*.
- 3rd Semester, 2019 : Differential Calculus, C-Programming, Numerical Analysis Techniques Laboratory, *Undergraduate Level*.
- 3rd Year, 2019-20 : Numerical Analysis Techniques Laboratory, Probability and statistics, Tensor calculus, Metric Spaces, *Undergraduate Level*.
- 2nd Semester, 2020 : Real Analysis-I, Vectors, *Undergraduate Level*.
- 4th Semester, 2020 : Real Analysis-III, *Undergraduate Level*.
- 3rd Semester, 2020 : Real Analysis-II, *Undergraduate Level*.
- 5th Semester, 2020 : Probability and Statistics, Linear Programming Problem, *Undergraduate Level*.

At REVA Institute of Technology, Bengaluru, India

Autumn 2013 : Mathematics-III, Engineering Mathematics, *Undergraduate Level*.

At IISER-Kolkata, Kolkata, India

I have been a teaching assistant of several undergraduate courses (Foundation of mathematics-II, Mathematics-I, II, Basis real analysis I, II) and graduate courses (Measure Theory, Functional analysis, Fourier analysis) at IISER-Kolkata during my PhD.

ACHIEVEMENTS AND FELLOWSHIPS OBTAINED

- Postdoc at **Technische Universität Wien** October 2021-present
- Project Assistant at **Montanuniversität Leoben** , April 2021-October 2021
- Postdoc at **TIFR-CAM, Bengaluru** , 2020 (September)
- IISER-Kolkata Research Fellowship 2019 (June).
- **All India rank 3** in CSIR-NET Exam June 2013
- Shyamaprasad Mukherjee fellowships for PhD for securing **All India rank 3** in NET-CSIR Exam from 2014 to 2018.
- Research scholar fellowship from TIFR-CAM from 2009 to 2013 (June).
- Secured **1st rank** in the M.Sc. batch at TIFR-CAM, 2009.
- Junior research scholar fellowship from TIFR-CAM, 2007-2009.
- Secured **23rd rank** in the merit list of admission to M.Sc.(Mathematics), JAM-IIT entrance examination, 2007.
- Secured **6th rank** in the university's merit list of B.Sc.(Mathematics Honours), University of Calcutta, 2007.
- National scholarship from West Bengal Council of Higher Secondary Education during under graduation (2004-2007).
- Obtained **full marks in Mathematics (200/200)**, in Higher Secondary exam, West Bengal Council of Higher Secondary Education, 2004.

Talks

- Approximate Controllability of the FitzHugh-Nagumo equation in one dimension, IIT Mumbai, 23 February, 2020.
- Three Problems in Nonlinear Analysis, TIFR-CAM, Bengaluru, 23 January, 2020.
- Three Problems in Nonlinear Analysis, IISER-Kolkata, 16 January, 2020.
- One dimensional Bliss Inequality: Generalization of Hardy's Inequality, IISER-Kolkata, 04 March, 2018.

Participation in Conference and Workshop (Without talk)

- Advance Instructional School on h-Principle at ISI -Kolkata, May 22-June 19, 2017.
- Advance Training in Mathematics Workshops Partial Differential Equations and Fourier Analysis at IIT Kanpur, December 8-20, 2014.
- Compact Course on Navier Stokes Equation for Incompressible Fluids TIFR-CAM, June 03-13, 2014.
- Advance Instructional Workshop on Analysis and Geometry at TIFR-CAM, July 08-27, 2013.
- Non-linear functional analysis and applications at IMSc, Chennai, India, January 18-20, 2012.
- School and workshop on co-compact imbeddings, profile decompositions and their application to pde at TIFR-CAM, January 03-12, 2012.
- Course on Semilinear PDE at BCAM, Spain in January 2011.
- Course on Inverse problem at BCAM, Spain in January 2011.
- International Congress of Mathematics(ICM) 2010 in Hyderabad, India.
- ICM Staelite conference on PDE and related topics at TIFRCAM Bangalore, India on August 13-17, 2010.
- International Workshop and Conference on Control Theory and Inverse Problem on from December 1-18, 2009.
- Attended Instructional Workshop on Differential Geometry at University of Mysore from June 16-25, 2008.

Prof. Erika Hausenblas.

Montanuniversität Leoben,

Leoben, Austria.

email: erika.hausenblas@unileoben.ac.at

Tel: + 43-3842 / 402 - 1701.

Dr. Saugata Bandyopadhyay.

Associate Professor, IISER-Kolkata,

Kolkata, India.

email: saugata.bandyopadhyay@iiserkol.ac.in

Tel: +919051051778.

Prof. Mythily Ramaswamy.

International Centre for Theoretical Sciences

Bengaluru, India.

email: mythily@math.tifrbng.res.in

Prof. Emmanuel trélat.

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Laboratoire Jacques-Louis Lions, CNRS,
Inria, équipe CAGE,
4 place Jussieu, BC 187,
75252 Paris cedex 05, France.
email: emmanuel.trelat@sorbonne-universite.fr
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Dr. Shirshendu Chowdhury.

Assistant Professor, IISER-Kolkata,
Kolkata, India.
email: shirshendu@iiserkol.ac.in
Tel: +919038165292.